

In the Matter of

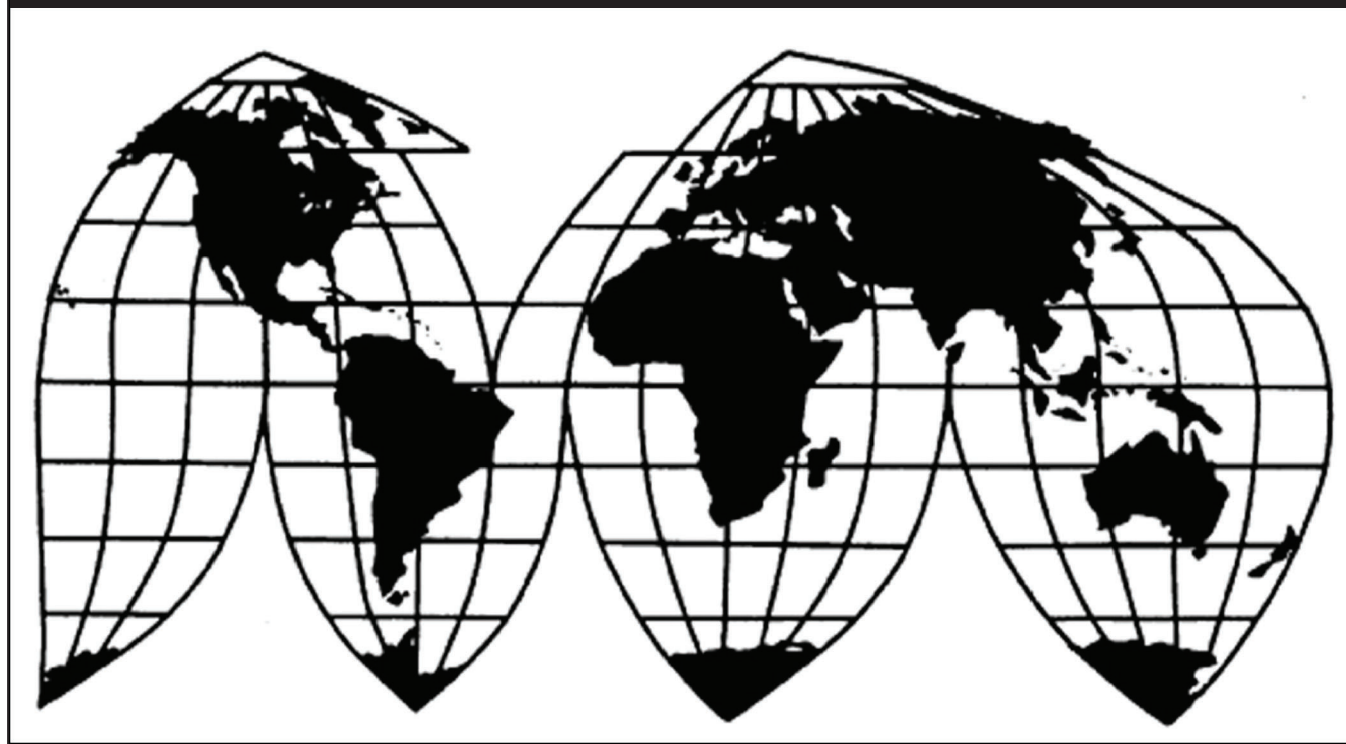
**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

337-TA-1170

Publication 5312

March 2022

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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CERTAIN MOBILE DEVICES WITH MULTIFUNCTION EMULATORS

337-TA-1170



UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of

**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

Investigation No. 337-TA-1170

**NOTICE OF COMMISSION DETERMINATION FINDING NO VIOLATION OF
SECTION 337; TERMINATION OF INVESTIGATION**

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to affirm, with modifications, the Administrative Law Judge's ("ALJ") final initial determination ("ID") issued on March 16, 2021, finding no violation of section 337 in the above-referenced investigation. The investigation is terminated.

FOR FURTHER INFORMATION CONTACT: Panyin A. Hughes, Office of the General Counsel, U.S. International Trade Commission, 500 E Street SW, Washington, D.C. 20436, telephone (202) 205-3042. Copies of non-confidential documents filed in connection with this investigation may be viewed on the Commission's electronic docket (EDIS) at <https://edis.usitc.gov>. For help accessing EDIS, please email EDIS3Help@usitc.gov. General information concerning the Commission may also be obtained by accessing its Internet server at <https://www.usitc.gov>. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: On August 16, the Commission instituted this investigation based on a complaint filed by Dynamics Inc. ("Dynamics") of Cheswick, Pennsylvania. 84 FR 42009-10 (Aug. 16, 2019). The complaint, as supplemented, alleges violations of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain mobile devices with multifunction emulators by reason of infringement of one or more of claims 1 and 5-8 of U.S. Patent No. 8,827,153 ("the '153 patent"); claims 1-20 of U.S. Patent No. 10,032,100 ("the '100 patent"); claims 1-7, 9-13, 19, 21, and 22 of U.S. Patent No. 10,223,631 ("the '631 patent"); and claims 1-16 of U.S. Patent No. 10,255,545 ("the '545 patent"). *Id.* at 42010. The Commission's notice of investigation named

as respondents Samsung Electronics Co., Ltd of Gyeonggi, Republic of Korea and Samsung Electronics America, Inc. of Ridgefield Park, New Jersey (collectively, “Samsung”). *Id.* The Office of Unfair Import Investigations is not participating in this investigation.

On September 3, 2019, the ALJ set a sixteen-month target date of December 16, 2020 for completion of the investigation. Order No. 3 (Sept. 3, 2019). The Order set an evidentiary hearing for May 11-15, 2020.

On November 26, 2019, the ALJ held a *Markman* hearing, and on January 31, 2020, issued Order No. 7, construing certain claim terms of the asserted patents.

On May 20, 2020, the ALJ issued an initial determination granting Dynamics’ unopposed motion for partial termination of the investigation as to claims 5, 6, and 8 of the ’153 patent, claims 2, 3, 5, 7, 9-11, 13-17, 19, and 20 of the ’100 patent, claims 2, 3, 5, 7, 9-13, 19, and 21 of the ’631 patent, and claims 2, 4, and 6-16 of the ’545 patent. Order No. 15 (May 20, 2020), *unreviewed by* Notice (June 15, 2020).

Due to the COVID-19 pandemic, the ALJ amended the procedural schedule several times. On March 12, 2020, the Commission postponed all in-person hearings under section 337 scheduled within the next sixty days. *See* 85 FR 15498 (Mar. 18, 2020). Thus, the ALJ issued Order No. 10, rescheduling the evidentiary hearing for June 22-26, 2020.

On April 6, 2020, the ALJ issued Order No. 12, resetting the target date to February 23, 2021 due to the COVID-19 pandemic. Order No. 12 (Apr. 6, 2020), *unreviewed by* Notice (Apr. 24, 2020).

On May 14, 2020, the Commission extended the postponement of all section 337 hearings. *See* 85 FR 30734-5 (May 20, 2020). On June 22, 2020, the Commission further extended the postponement of all in-person section 337 hearings. 85 FR 38388-9 (June 26, 2020).

On August 11, 2020, the ALJ scheduled a virtual hearing for November 16-20, 2020 and reset the target date for July 16, 2021. Order No. 24 (Aug. 11, 2020), *unreviewed by* Notice (Sept. 8, 2020).

On March 16, 2021, the ALJ issued the final ID, finding no violation of section 337. The ID found that the importation requirement under 19 U.S.C. 1337(a)(1)(B) is satisfied. ID at 28. Specifically, the ID found that “[t]he parties stipulated to facts establishing the importation requirement is met for both respondents” and that “Samsung does not dispute the Commission’s jurisdiction over this investigation or that the requisite importation or sale in connection with importation has taken place for each Accused Product.” *Id.* Accordingly, the ID found that the Commission has jurisdiction over this investigation and that the importation requirement has been satisfied. *Id.*

With respect to the domestic industry requirement, the ID found that Dynamics had satisfied the domestic industry requirement for the '100 patent, but not the '153, '631, and '545 patents. ID at 183-84. For the '153 patent, the ID found that Dynamics failed to show it practiced any claim of the patent, but had shown it made significant investments under section 337(a)(3)(A) and (B), 19 U.S.C. 1337(a)(3)(A)-(B). *Id.* at 60-64, 158-79. Likewise, as to the '631 patent, the ID found that Dynamics failed to show it practiced any claim of the patent, but had made significant investments for purposes of subsections (a)(3)(A) and (B). *Id.* at 127-31, 158-79. For the '545 patent, the ID found that Dynamics had shown it was “in the process” of practicing claim 1, but had not shown it was “in the process” of establishing a U.S. industry. *Id.* at 148-52, 180-83; *see also* 19 U.S.C. 1337(a)(2).

With respect to infringement and validity, the ID found that Samsung infringes claims 1 and 7 of the '153 patent and that Samsung failed to establish that those claims are invalid. ID at 45-58, 64-69. The ID also found that Samsung infringes claims 1, 4, 6, 12, and 18 of the '100 patent (except for claim 6 as to certain modified products), but that the asserted claims, except for claim 4 are invalid as anticipated or obvious by prior art. *Id.* at 83-88, 96-115. The ID further found that Samsung directly infringes claims 1, 4, 6, and 22 of the '631 patent, but that those claims are invalid as anticipated or obvious by prior art. *Id.* at 121-127, 131-140. The ID also found that Samsung directly infringes claims 1, 3, and 5 of the '545 patent, but that those claims are invalid for anticipation. Finally, the ID found that Samsung failed to carry its burden with respect to various additional affirmative defenses under 35 U.S.C. 102(f), 116 (inventorship), or 112 (written description and enablement).

The ALJ recommended that the Commission should issue a limited exclusion order and cease and desist orders if it finds a violation but that no bond should be imposed on covered products that may be imported during the period of Presidential review. ID/RD at 186-91, 193.

On March 29, 2021, Dynamics filed a petition for review of the ID, and Samsung filed a contingent petition for review. On April 8, 2021, Dynamics and Samsung submitted responses to each other's petitions.

On May 17, 2021, the Commission determined to review the ID in part. 86 FR 27651-53 (May 21, 2021). Specifically, the Commission determined to review the ID with respect to the following: (1) for the '153 patent, claim construction of the term “analog waveform” as well as the related infringement and technical prong analyses and the ID's finding that the combination of Shoemaker and Gutman fails to render the asserted claims obvious; (2) for the '100 patent, whether Doughty in combination with VivoTech renders obvious claim 4 and whether such issue was waived, whether claims 4 and 6 are infringed, and whether the domestic industry requirement is satisfied; and (3) for the '545 patent, the ID's domestic industry findings. *Id.* at 27652. In connection with its review, the Commission requested that the parties brief their positions on certain issues.

Having examined the record of this investigation, including the ID, the parties' submissions and the responses thereto, the Commission has determined to affirm, with

modifications, the ID's finding of no violation of section 337 in this investigation. With respect to the issues under review, for the '153 patent, the Commission has determined to (1) adopt Samsung's proposed construction of the claim limitation "analog waveform" to mean "a wave shape whose amplitude changes in a continuous fashion," but clarify that the construction encompasses so-called real-world square waves; (2) affirm the ID's finding that the accused Samsung Products infringe the asserted claims; (3) affirm the ID's finding that Dynamics failed to adduce sufficient evidence to establish that its DI products practice any claims of the patent; and (4) reverse the ID's finding that the combination of Shoemaker and Gutman fails to render the asserted claims obvious. For the '100 patent, the Commission has determined to (1) reverse the finding that Samsung failed to show that Doughty in combination with VivoTech renders claim 4 obvious; (2) clarify that claims 4 and 6 are infringed; and (3) find the domestic industry requirement not met because the domestic industry claim has been found invalid. For the '545 patent, the Commission has determined to take no position on the ID's domestic industry findings related to a domestic industry in the process of being established.

Accordingly, the Commission has determined to terminate the investigation with a finding of no violation of section 337.

The Commission's vote on this determination took place on July 16, 2021.

The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), and in part 210 of the Commission's Rules of Practice and Procedure (19 CFR 210).

By order of the Commission.

A handwritten signature in black ink, appearing to read "Lisa R. Barton", enclosed within a large, loopy oval shape.

Lisa R. Barton
Secretary to the Commission

Issued: July 16, 2021

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **NOTICE** has been served upon the following parties as indicated, on **July 16, 2021**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
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Washington, DC 20436

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PUBLIC VERSION

In the Matter of

**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

Investigation No. 337-TA-1170

COMMISSION OPINION

Table of Contents

I. Introduction.....	2
II. Background	2
A. Procedural History	2
B. Overview of the Technology	5
C. The Asserted Patents.....	6
D. The Accused Products.....	7
E. Domestic Industry Products.....	7
III. Analysis of Issues Under Review	8
A. The '153 Patent	8
1. Claim Construction of the Term “Analog Waveform”.....	8
2. Infringement of Claims 1 and 7	17
3. Technical Prong of the Domestic Industry Requirement.....	23
4. Obviousness of Claims 1 and 7 – Gutman in View of Shoemaker.....	28
B. The '100 Patent	40
1. Infringement of Claims 4 and 6	40
2. Obviousness of Claim 4 – Doughty in View of VivoTech.....	41
3. Domestic Industry	44
C. The '545 Patent: Domestic Industry	45
IV. Conclusion	45

PUBLIC VERSION

I. INTRODUCTION

On May 17, 2021, the Commission determined to review in part the final initial determination (“ID”) issued by the presiding administrative law judge (“ALJ”) on March 16, 2021. 86 Fed. Reg. 27651-53 (May 21, 2021). On review, the Commission has determined to affirm, with modifications, the ID’s finding that there has been no violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337. This opinion sets forth the Commission’s reasoning in support of that determination. In addition, the Commission adopts the remainder of the ID that is not inconsistent with this opinion.

II. BACKGROUND

A. Procedural History

On August 16, 2019, the Commission instituted this investigation based on a complaint filed by Dynamics Inc. (“Dynamics”) of Cheswick, Pennsylvania. 84 Fed. Reg. 42009-10 (Aug. 16, 2019). The complaint, as supplemented, alleges violations of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain mobile devices with multifunction emulators by reason of infringement of one or more of claims 1 and 5-8 of U.S. Patent No. 8,827,153 (“the ’153 patent”); claims 1-20 of U.S. Patent No. 10,032,100 (“the ’100 patent”); claims 1-7, 9-13, 19, 21, and 22 of U.S. Patent No. 10,223,631 (“the ’631 patent”); and claims 1-16 of U.S. Patent No. 10,255,545 (“the ’545 patent”). *Id.* at 42010. The Commission’s notice of investigation named two respondents, Samsung Electronics Co., Ltd of Gyeonggi, Republic of Korea, and Samsung Electronics America, Inc. of Ridgefield Park, New Jersey (collectively, “Samsung”).¹ *Id.*

¹ The Office of Unfair Import Investigations did not participate in this investigation.

PUBLIC VERSION

On November 26, 2019, the ALJ held a *Markman* hearing, and on January 31, 2020, he issued Order No. 7, which construed several claim terms of the asserted patents. On May 20, 2020, the ALJ issued an initial determination terminating the investigation as to claims 5, 6, and 8 of the '153 patent, claims 2, 3, 5, 7, 9-11, 13-17, 19, and 20 of the '100 patent, claims 2, 3, 5, 7, 9-13, 19, and 21 of the '631 patent, and claims 2, 4, and 6-16 of the '545 patent. Order No. 15 (May 20, 2020), *unreviewed by* Notice (June 15, 2020).

Due to the COVID-19 pandemic, the ALJ amended the procedural schedule several times. The ALJ held a virtual hearing from November 16-20, 2020. Order No. 24 (Aug. 11, 2020), *unreviewed by* Notice (Sept. 8, 2020).

On March 16, 2021, the ALJ issued the final ID, which found no violation of section 337. The ID found that Samsung infringes claims 1 and 7 of the '153 patent and that Samsung failed to establish that those claims are invalid. ID at 45-58, 64-69. The ID also found that Samsung infringes claims 1, 4, 6, 12, and 18 of the '100 patent (except for claim 6 as to certain modified products), but that the asserted claims, except for claim 4, are anticipated or obvious. *Id.* at 83-88, 96-115. The ID further found that Samsung directly infringes claims 1, 4, 6, and 22 of the '631 patent, but that those claims are anticipated or obvious. *Id.* at 121-127, 131-140. The ID also found that Samsung directly infringes claims 1, 3, and 5 of the '545 patent, but that those claims are anticipated and therefore invalid.

With respect to the domestic industry requirement, the ID found that Dynamics had satisfied the domestic industry requirement for the '100 patent, but not the '153, '631, and '545 patents. ID at 183-84. For the '153 patent, the ID found that Dynamics failed to show it practiced any claim of the patent, but had shown it made significant investments under section 337(a)(3)(A) and (B), 19 U.S.C. § 1337(a)(3)(A)-(B). *Id.* at 60-64, 158-79. Likewise, as to the

PUBLIC VERSION

'631 patent, the ID found that Dynamics failed to show it practiced any claim of the patent, but had made significant investments for purposes of subsections (a)(3)(A) and (B). *Id.* at 127-31, 158-79. For the '545 patent, the ID found that Dynamics had shown it was “in the process” of practicing claim 1, but had not shown it was “in the process” of establishing a U.S. industry. *Id.* at 148-52, 180-83; *see also* 19 U.S.C. § 1337(a)(2).

Accordingly, the ID found no violation as to all asserted patents. The ALJ recommended that the Commission issue a limited exclusion order and cease and desist orders if it finds a violation. ID at 186-91.

On March 29, 2021, Dynamics petitioned for review of the ID, and Samsung contingently petitioned for review.² On April 8, 2021, Dynamics and Samsung responded to each other's petitions.³

On May 17, 2021, the Commission determined to review the ID in part.⁴ 86 Fed. Reg. 27651-53 (May 21, 2021). Specifically, the Commission determined to review the ID with respect to the following: (1) for the '153 patent, claim construction of the term “analog waveform” as well as the related infringement and technical prong findings, and the ID's finding that the combination of U.S. Patent No. 6,206,293 (“Gutman”) (RX-877) and U.S. Patent No.

² *See* Complainant's Petition for Commission Review of Initial Determination on Violation of Section 337 and Recommended Determination on Remedy and Bonding (“Dynamics Pet.”); Respondents' Contingent Petition for Review (“Samsung Pet.”).

³ *See* Complainant's Response to Respondents' Petition for Review (“Dynamics Resp.”); Respondents' Response to Dynamics' Petition for Review (“Samsung Resp.”).

⁴ Dynamics did not petition for review of the ALJ's finding of no violation of section 337 with respect to the '631 patent, and the Commission determined not to review that finding, thereby affirming that there is no violation as to the '631 patent. Thus, the '631 patent is no longer at issue in this investigation.

PUBLIC VERSION

7,690,580 (“Shoemaker”) (RX-884) fails to render the asserted claims obvious; (2) for the ’100 patent, whether U.S. Patent Publication No. 2006/0161789 (“Doughty”) (RX-283) in combination with U.S. Patent No. 7,114,652 (“VivoTech”) (RX-881) would have rendered obvious claim 4 and whether Samsung waived this issue, whether claims 4 and 6 are infringed, and whether the domestic industry requirement is satisfied; and (3) for the ’545 patent, the ID’s domestic industry findings. *Id.* at 27652. The Commission determined not to review the remainder of the ID. In connection with its review, the Commission requested briefing from the parties. *Id.* at 27652-3. On June 2, 2021, the parties submitted opening briefs.⁵ On June 9, 2021, the parties filed reply briefs.⁶

B. Overview of the Technology

The technology at issue relates to making payments through point-of-sale (“POS”) systems without the use of traditional credit or debit cards bearing magnetic stripes. *ID* at 4. The magnetic stripe on the back of a traditional payment card contains data that is communicated to a magnetic card reader when the card is swiped at the POS System. *Id.* at 6. The stripe and the embedded data are standardized by various organizations, including the International Organization for Standardization and the International Electrotechnical Commission. *Id.* These standards require card manufacturers to encode payment data in the frequency/double frequency (F2F) encoding format. *Id.* The standards further require that the data be organized into “tracks”

⁵ See Complainant’s Submission Pursuant to Commission’s Notice of Determination to Review (“Dynamics Sub.”); Respondents’ Response to the Commission’s Notice and Request for Written Submissions (“Samsung Sub.”).

⁶ See Complainant’s Reply to Respondents’ Response to the Commission’s Notice and Request for Written Submission (“Dynamics Reply”); Respondents’ Reply to the Commission’s Notice and Request for Written Submissions (“Samsung Reply”).

PUBLIC VERSION

and, more specifically, between one to three tracks, referred to as Track 1, Track 2, and Track 3.
Id.

“In traditional point-of-sale systems, the data contained in each track (*i.e.*, contained in the magnetic stripe) is read by swiping or sliding the stripe against a fixed magnetic read head in a magnetic card reader” so that “the read head reads each bit of data as it moves by.” *Id.* at 6-7.
“In order to communicate this same information to the same type of read head, the inventions of the asserted patents create magnetic fields similar to those created by the magnetic stripe of the traditional payment card.” *Id.* at 7.

C. The Asserted Patents

The '153 patent, entitled, “Systems and Methods for Waveform Generation for Dynamic Magnetic Stripe Communication Devices,” issued on September 9, 2014. '153 patent (CX-667; RX-48). The patent describes “powered cards and devices and related systems” that “may include a dynamic magnetic communications device, which may take the form of a magnetic encoder or a magnetic emulator.” '153 patent at 1:17-18, 22-24. Dynamics asserts independent claim 1 and dependent claim 7. *ID* at 4.

The '100 patent, entitled, “Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same,” issued on July 24, 2018. '100 patent (CX-669; RX-47). The patent describes a payment card with a magnetic emulator that can communicate information to a magnetic stripe reader. *Id.* at abstract. The “information used in validating a financial transaction is encrypted based on time such that a validating server requires receipt of the appropriate encrypted information for a period of time to validate a transaction for that period of time.” *Id.* Dynamics asserts independent claims 1 and 12 and dependent claims 4, 6, 8, and 18, though claim 8 is asserted only for domestic industry purposes. *ID* at 5.

PUBLIC VERSION

The '545 patent, entitled, “Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same,” issued on April 9, 2019. '545 patent (CX-673; RX-50). This patent shares a specification with the '100 and '631 patents, and it describes a payment card with a magnetic emulator that can communicate information to a magnetic stripe reader. *Id.* at abstract. Dynamics asserts independent claims 1 and dependent claims 3 and 5. ID at 5.

D. The Accused Products

The accused products are Samsung smartphones and smart watches that incorporate the Samsung Pay application and utilize so-called Magnetic Secure Transmission (“MST”) in order to complete payment transactions in POS systems. ID at 7. Dynamics specifically accuses the following devices of infringement: Samsung Galaxy S10, Galaxy S8, Galaxy S8+, Galaxy S9, Galaxy S9+, Galaxy S10e, Galaxy S10+, Galaxy S10 5G, Note 7, Note 8, Note 9, Note 10, Galaxy S20, Galaxy Fold, Galaxy A50, Galaxy A51, Samsung Gear S3, and Gear S3 Frontier.⁷ *Id.*

E. Domestic Industry Products

The domestic industry products in this investigation are payment cards which include a microprocessor, coil, battery, and other electrical components, and are dimensioned so as to meet the form factor (*e.g.*, shape) of traditional payment cards with magnetic stripes. ID at 7. Dynamics asserts its products are “intended for use in the traditional manner – *i.e.*, to be swiped through a trough in the magnetic stripe reader’ in a point-of-sale device.” *Id.* “The specific

⁷ The ALJ found that certain Samsung products bearing the same model numbers as some of the Accused Products including the Galaxy S10, Galaxy A50, and Galaxy A70 do not infringe the asserted claims in light of hardware and/or software modifications removing the MST functionality. ID at 8-16. Dynamics did not petition for review of these findings, and the Commission did not review them.

PUBLIC VERSION

models include the IndusInd device, the CIBC device, the SMCC device, and the Emirates NBD device (also referred to as the Connected Wallet Card) (collectively, the “DI Products”).” *Id.*

III. ANALYSIS OF ISSUES UNDER REVIEW

A. The ’153 Patent⁸

1. Claim Construction of the Term “Analog Waveform”

a) Legal Standard

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *Markman v. Westview Instr., Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). The Federal Circuit explained in *Phillips* that courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

⁸ Vice Chair Stayin does not join the Commission Opinion as to the ’153 patent, but joins the finding of no violation of section 337. As set forth in the Vice Chair’s Separate Views, the Vice Chair would find (1) the accused products do not infringe the claims of the ’153 patent properly construed; (2) Dynamics satisfied the technical prong of the domestic industry requirement; and (3) Samsung did not show the ’153 patent is invalid as obvious over Gutman in combination with Shoemaker.

PUBLIC VERSION

“Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Phillips*, 415 F.3d at 1314; *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”).

“[T]he specification ‘is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316.

In addition to the claims and the specification, the prosecution history should be examined if in evidence. *Phillips*, 415 F.3d at 1317. The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”). When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including

PUBLIC VERSION

dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered.

Phillips, 415 F.3d at 1317.

b) *Analysis: “Analog Waveform”*

Claim 1, with the disputed claim term emphasized, recites:

A device comprising:

a magnetic stripe emulator operable to communicate an **analog waveform** encoded with at least one track of magnetic stripe data to a magnetic stripe reader; and

a waveform generator operable to generate said **analog waveform** from a digital representation of said at least one track of magnetic stripe data,

wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data.

’153 patent at 15:14-23.

Claim 7 recites:

The device of claim 1, wherein said **analog waveform** is encoded with two tracks of magnetic stripe data.

Id. at 15:43-44.

The Commission determined to review the construction of the claim term “analog waveform” and asked the parties to comment on the following issue:

If the Commission construes “analog waveform” to mean “a wave shape whose amplitude changes in a continuous fashion” that includes so-called real-world square waves, please cite record evidence and explain whether the accused products and DI products meet the relevant claim limitations.

On review, and for the reasons that follow, the Commission has determined to adopt Samsung’s proposed construction of “a wave shape whose amplitude changes in a continuous fashion,” with the clarification that the construction includes so-called real-world square waves.

PUBLIC VERSION

The ID noted that, although the parties disputed the meaning of the term “analog waveform,” the term was not presented for construction during the *Markman* hearing and the parties did not treat the disagreement as a claim construction dispute in their pre-hearing briefs. ID at 34. Given these circumstances, the ALJ prudently asked the parties to propose constructions for the term in their post-hearing briefs. *Id.* The parties proposed the following constructions:

Dynamics’ Proposed Construction	Samsung’s Proposed Construction
a waveform that conveys information in a non-binary manner	a wave shape whose amplitude changes in a continuous fashion

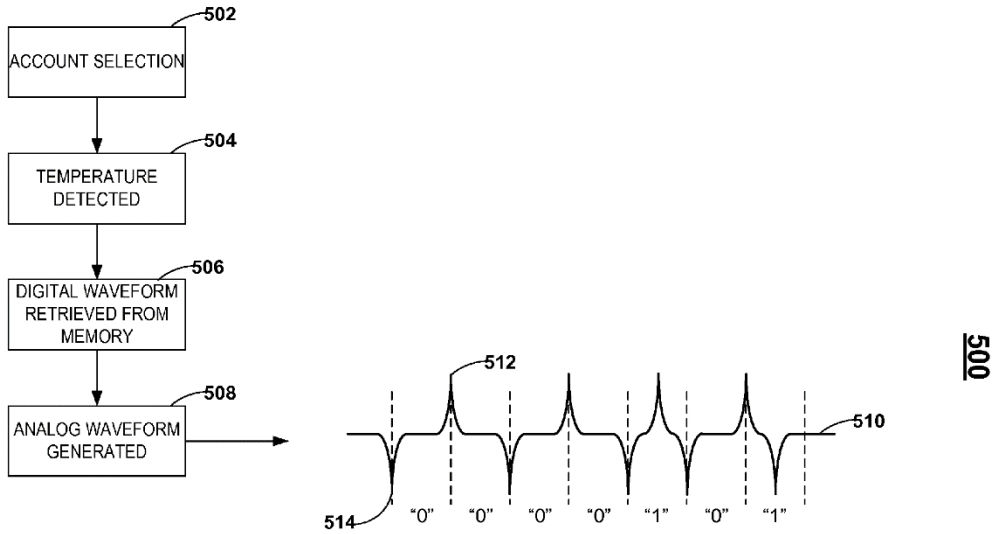
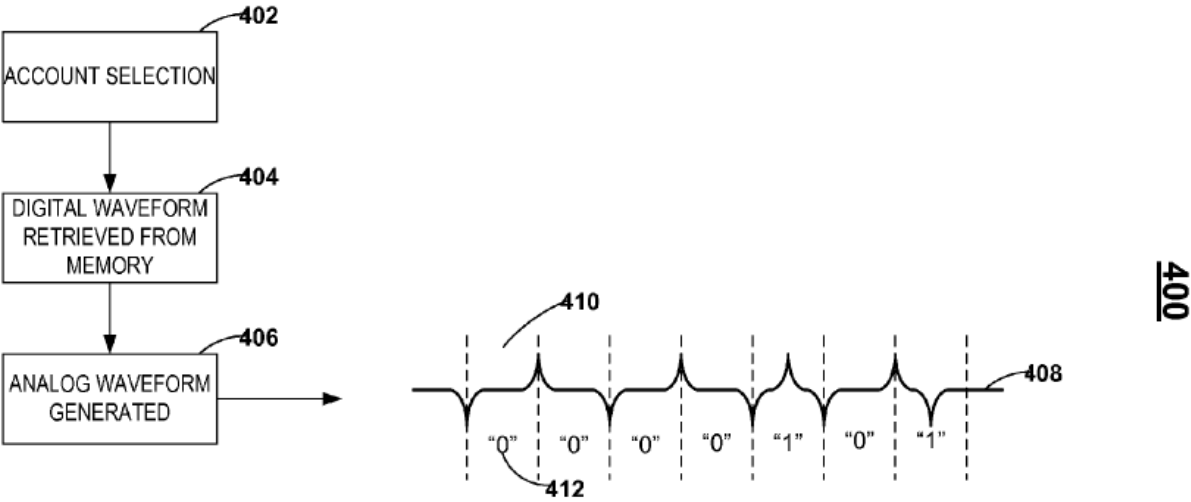
Id. After reviewing the parties’ arguments and the evidence they cited, the ALJ concluded that “neither proposal is especially well-supported by the intrinsic evidence” and declined to adopt either construction. *Id.* (“I am not obliged to accept one or the other proposed construction; an adjudicator ‘may adopt a definition not proposed by either party that best fits with the claim language and the specification.’” (quoting *Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372, 1376 (Fed. Cir. 2017))). The ID ultimately found that “[t]he crucial point for claim construction purposes, though, is that any construction consistent with the specification must encompass real-world square waves, whatever the correct construction may be” and concluded that “that finding resolves the parties’ dispute over infringement.” ID at 40.

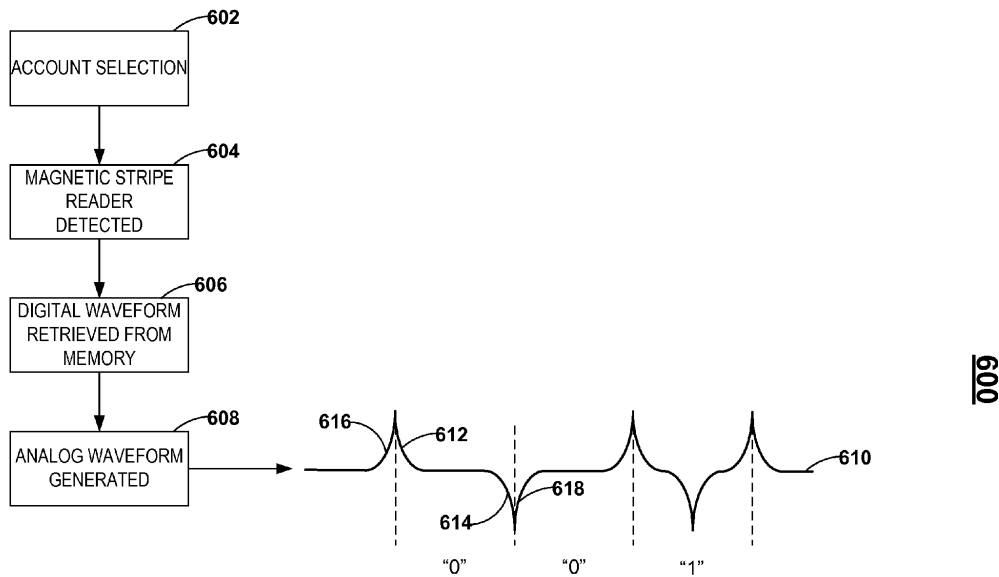
On review, the Commission adopts Samsung’s proposed construction and construes “analog waveform” to mean “a wave shape whose amplitude changes in a continuous fashion,” and clarifies that the construction includes so-called real-world square waves because they have waveforms with amplitudes that change in a continuous fashion. The Commission agrees with

PUBLIC VERSION

Samsung that this definition comports with the plain and ordinary meaning of “analog waveform.”

In adopting Samsung’s construction, the Commission notes that it is undisputed that the plain and ordinary meaning of “waveform” is the shape of a wave. Indeed, the record contains five different technical dictionaries, evincing the ordinary and customary meaning of analog waveform, that define “waveform” to be the shape, or graphical representation, of a wave. *See, e.g.*, IBM Dictionary of Computing (RX-1643 at 3) (“A graphical representation of the shape of a wave . . .”); Illustrated Dictionary of Electronics (RX-1645 at 3) (“The shape of a wave. . .”); McGraw-Hill Electronics Dictionary (RX-1647 at 3) (“The shape of a wave”); Newton’s Telecom Dictionary (RX-1650 at 3) (“The characteristic shape of a signal”); and Wiley Electrical and Electronics Engineering Dictionary (RX-1662 at 3) (“The shape, or a graphical representation of such a shape, of a wave”). Dynamics’ witnesses agreed that “waveform” means “waveshape.” Tr. (Workley) at 57:16-21 (“Q. The word ‘waveform’ means waveshape, correct? A. That would be a definition of it, yes. Q. Well, that’s how you used it at your deposition when I asked you how you could tell a waveform and you said look at the waveshape, right? A. Yes.”); Tr. (Zatkovich) at 190:5-7 (“Q. So a synonym of waveform is waveshape, right? A. I would not disagree with that.”). Next, the specification discloses that an analog waveform is a continuous wave shape as shown in Figures 4-6:





The patent disclosure is consistent with the technical literature that teach that an analog wave shape is a continuous wave shape. *See, e.g.*, RX-1665 at 5 (Putman textbook explaining that “[t]he term ‘analog’ refers to a waveform whose amplitude changes in a continuous fashion.”); RX-1654 at 5 (Smillie textbook explaining that “[a]n analog signal is defined as a continuous waveform having positive peak and a negative peak and having an infinite range of levels.”). Indeed, no one disputes this intrinsic evidence confirmed by the extrinsic evidence. Yet, Samsung urges the Commission to exclude real-world square waveforms from the scope of the construction because it contends that the wave shape of a square wave is a digital waveform having a discretely changing amplitude rather than an analog waveform having a continuously changing one. The Commission agrees with the ID that the term “analog waveform” includes real-world square waveforms.

The ID noted Samsung’s argument that, under its proposed construction, a square wave is a wave comprised of discrete states, akin to a digital wave and not an analog wave. ID at 39.

The ID agreed that “a signal that consists purely of discrete amplitudes would likely not qualify

PUBLIC VERSION

as analog in the context of the '153 patent,” and went on to observe that “it is not clear how Samsung’s proposed construction encompasses the one waveform illustrated in the Figures—what one skilled in the art apparently would know as a ‘Lorentz waveform’ (*see* CX-0155C.0025)—while excluding real-world square waves.” *Id.*

To ascertain the meaning of an analog waveform, the ALJ examined the specification. Specifically, the ALJ focused upon waveform 408 depicted in Figure 4 (shown above), which is indisputably an analog waveform. ID at 38 (reproducing '153 patent, Fig. 4 and additionally citing Figs. 5, 6, 12:46-61; CIB at 25; RIB at 17). The ALJ found that “[t]he Lorentz waveform has an amplitude of zero for most of its length, but is nonetheless continuous and has transitions.” *Id.* (citing '153 patent at Fig. 4 (waveform 408)). The ALJ stated that the 1 and 0 annotations indicate that the information in the signal is conveyed in a binary, not a non-binary, manner and that “consistent with the preferred embodiment (the F2F encoding scheme), signal level transitions are the mechanism by which the information is conveyed.” *Id.* (citing CIB at 24-27; CRB at 4; '153 patent at 10:36-40 (“The magnetic stripe message may, for example, be encoded (e.g., F2F encoded) such that a logic “1” may be encoded as a transition within any bit period and a logic “0” may be encoded as a lack of a data transition within any bit period.”)). Further, the ID notes that the transitions “are inherently continuous and require periodic verticality in the wave shape.” *Id.*

Moreover, the ID evaluated the disclosures of the specification relating to Figure 4 and found that this embodiment appears to disclose a square wave as an example of an analog waveform. ID at 39-40. The ID quotes from the specification as follows:

In step 406, the magnetic stripe message may be converted from a digital format to an analog format to produce waveform 408. In particular, a DAC may be used to convert each digital symbol into an analog signal (e.g., a current signal having a magnitude that is proportional to a digital value of the digital symbol and a

PUBLIC VERSION

polarity as defined by a sign bit of the digital symbol). Each digital symbol may be converted to its analog equivalent at a rate that may be defined by a frequency of a clock signal that is provided to the DAC.

Id. (quoting '153 patent at 12:59-67). The ALJ explained that “the description of that analog signal apparently corresponds to a square wave, with time on the x-axis and the magnitude of the current on the y-axis, and where the magnitude of the current is ‘proportional to a digital value of the digital symbol,’ that is, except for transitions it is either at its maximum or at zero, assuming the ‘digital symbol’ is either one or zero.” ID at 40.

The ALJ explained that “any real-world square wave may have an amplitude at either the maximum or minimum for most of its length, but it is still continuous and has transitions, that is, its amplitude passes through zero and every intervening value between maximum and minimum. And, again, any square wave which would be operative to encode magnetic stripe data using the F2F protocol necessarily would be a real-world, continuous square wave possessing transitions.” *Id.*

The Commission agrees with the ALJ, and notes that the ALJ implicitly found that Samsung’s proposed construction of “a wave shape whose amplitude changes in a continuous fashion” includes real-world square waveforms based on the disclosures in the specification in Figure 4 and as explained in column 12. As the ALJ observed, “under Samsung’s proposed construction, there appears to be no principled distinction between the admittedly analog Lorentz waveform and a square wave.” ID at 39. Accordingly, the Commission adopts Samsung’s proposed construction and construes “analog waveform” to mean “a wave shape whose amplitude changes in a continuous fashion” with the clarification that the construction includes real-world square waveforms.

2. *Infringement of Claims 1 and 7*

a) *Legal Standard*

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995), *aff’d*, 517 U.S. 370 (1996). A patentee must prove infringement by a preponderance of the evidence, which “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

b) *Analysis: “Analog Waveform”*

For infringement, the ID found that “[t]he parties’ dispute over ‘analog waveform’ in the infringement context is straightforward to resolve, notwithstanding Dynamics’ lack of argument on the point, because it is undisputed that the Accused Products employ a square wave.” ID at 51. The ID observed that “Samsung touts the evidence that they employ a square wave and that ‘[i]t stands to reason, however, that Samsung would not have taken such a position had the parties raised ‘analog waveform’ as a disputed claim in the *Markman* process.” *Id.* The ID found that “[r]egardless, ‘a waveform generator operable to generate said analog waveform’ has been shown in the Accused Products.” *Id.*

Samsung argues that its accused products do not meet the limitation under its claim construction because its products “do not generate or communicate a wave shape whose amplitude changes in continuous fashion.” Samsung Sub. at 6. Samsung explains that the wave form in its products “undisputedly varies between two and only two amplitudes: [[

]] and argues that, as such, its “MST square wave has a discretely changing amplitude, not a continuously changing one.” *Id.* at 6-7.

PUBLIC VERSION

Dynamics asserts that Samsung's accused products employ a real-world square wave that meets the "analog waveform" limitation and that "Samsung's own witnesses – Dr. Apsel and Woosup Lee – have consistently testified that Samsung's Accused Products communicate a real-world square wave to a magnetic stripe card reader." Dynamics Sub. at 6-7 (citing RX-1675C (Apsel) at Q/A 270, 296; RX-1670C (Lee) at Q/A 1-7, 22-24, 17). According to Dynamics, "[i]n addition to expressly referring to the output of the MST antenna as a 'square wave,' Samsung's witnesses further note that this 'square wave' exists in the real world, and thus includes the qualities of a real-world square wave, including continuity (*i.e.*, no immediate change between values), rise times, and fall times." *Id.* at 7.

The Commission affirms and adopts the ID's infringement findings because the ID applies a claim construction that embraces real-world square waves as having analog waveforms, and compares that construction to the waveforms generated by the Samsung products. Specifically, the ID credited the evidence that "Samsung's technical documentation shows [[

]]

ID at 50 (citing RX-121C at 9). In explaining the infringement finding, the ID observed that “the Accused Products operate in essentially the same way as one of the embodiments disclosed in the 153 patent.” *Id.* (citing ’153 patent at 12:59-67). That is, the oscilloscope reading from the Samsung product shows [[

]].

Samsung’s primary argument on this point is that “the amplitude of its MST square wave does not change continuously as required by Samsung’s construction, but discretely.” Samsung Sub. at 8. Samsung relies on the testimony of its engineer, Woosup Lee, and its expert, Dr. Apsel, that the accused MST IC is a motor controller that uses two and only two discrete states, high or low, corresponding to forward and reverse and that the MST IC “*only has two outputs*, [[
]].” *Id.* at 7-8. Samsung also points to the testimony of Dynamics’ expert, Mr. Zatkovich, who admitted that the amplitude of the accused

PUBLIC VERSION

products changes discretely in the Samsung square wave. Tr. (Zatkovich) at 325:5-8; 207:16-24 (the MST square wave “has ***two discrete*** levels, high and low, and alternates between them”).” *Id.* at 8. However, as Dynamics argued, Samsung’s expert, “Dr. Apsel admitted, despite her opinion that a digital waveform must be discontinuous, in the real world, to call a square wave digital is a misnomer, because there is no such thing as a discontinuous real-world square wave.” Dynamics Sub. at 8-9 (comparing RX-1675C (Apsel) at Q/A 290 (“Q290. What is the shape of a digital waveform? A290. It will be discontinuous with discrete levels, like a square wave.”), with RDX-1101 and RX-1675C (Apsel) at Q/A 294 (“[W]hile idealized digital waveforms are drawn with instantaneous transitions, in reality the transition from one discrete amplitude value to another takes some non-zero amount of time.”)).

Samsung also argues that “the distinction between a digital waveform like Samsung’s MST square wave, and an analog waveform under Samsung’s construction, is not whether the shape of the wave in a vacuum is continuous or discontinuous, but whether the ***amplitude changes*** continuously or discretely.” Samsung Sub. at 9 (emphasis by Samsung). Samsung then alleges that its expert, Dr. Apsel, testified that “rise and fall times ***do not represent signal amplitudes***, but represent the amount of time the square wave needs to transition from one discrete amplitude to another.” *Id.* (citing RX-1675C (Apsel) at Q/A 294). In Q/A 294, Dr. Apsel testified:

Q294. Do digital waveforms have instantaneous transitions between their discrete levels?

A294. As I explained at my deposition, while idealized digital waveforms are drawn with instantaneous transitions, in reality ***the transition from one discrete amplitude value to another takes some non-zero amount of time***, referred to as the rise time or fall time, depending on which edge of the pulse you’re looking at.

PUBLIC VERSION

RX-1675C (Apsel) at Q/A 294 (emphasis by Samsung). Dr. Apsel's testimony that Samsung cites, however, belies Samsung's argument. Dr. Apsel testified that "the transition from one discrete amplitude value to another takes some non-zero amount of time," and the Commission finds that during that non-zero amount of time (*e.g.*, the rise and fall times), the amplitude is changing continuously. RX-121C at 9 (Fig. 6 (reproduced above)).

Samsung argues that "[i]t is unclear precisely what the ID means by 'real-world square wave,' but the ID's infringement finding is contrary to the intrinsic record," pointing out that "the admitted prior art including the Poidomani reference [indicate that] a square wave like Samsung's MST square wave is a digital waveform." Samsung Sub. at 10 (citing RX-1675C (Apsel) at Q/A 312; CX-1204C (Zatkovich) at Q/A 39). The Commission finds this argument unpersuasive because the term "real-world square wave" as used in the ID is readily understandable to a person of ordinary skill in the art. The ID specifically stated that Samsung's technical documentation shows [[

]]. ID at 50. In other words, a real-world square wave results in a Lorentz waveform as disclosed in the '153 patent. The Commission finds that Samsung's reliance on the Poidomani reference for evidentiary support of non-infringement is untenable because while Poidomani may be relevant for claim construction, it has little relevance for assessing infringement. *See Tate Access Floors, Inc. v. Interface Architectural Res., Inc.*, 279 F.3d 1357, 1365 (Fed. Cir. 2002) ("there is no 'practicing the prior art' defense to literal infringement").

The ID did not err in finding that "a waveform generator operable to generate said analog waveform' has been shown in the Accused Products." *Id.* The oscilloscope reading of

PUBLIC VERSION

Samsung’s accused products (RX-121C at 9 (Fig. 6)) shows a real-world square wave resulting in a Lorentz-type analog waveform, which is within the scope of the asserted claims.

The Commission is also unpersuaded by Samsung’s argument that “there can be no infringement because the Samsung MST products do not have the related ‘waveform generator’ of claim 1.” Samsung Sub. at 12. According to Samsung, if its “MST square wave that is output from the MST IC is a ‘real-world square wave’ within the meaning of the ID and therefore an analog waveform, then so is the input to the MST IC” and as such, “the MST IC would be converting an analog representation—not a digital representation as required by Claim 1—to an analog waveform.” *Id.* at 12-13. The Commission finds this argument meritless. *See* ID at 50-56. The ID appropriately credited Dynamics’ argument that “certain [[]] of data communicated by MST [[]] and that [[]]

]] ID at 51-52 (citing RX-1674C (Goldberg) at Q/A 24, 28, 36-38, 43-50; RX-1675C (Apsel) at Q/A 330, 347-348; RX-1486; CX-1199C (Zatkovich) at Q/A 73-74, 88; Hr’g Tr. at 497:7-498:18, 505:13-506:1; RX-1673C (Choe) at Q/A 7, 35-36). As Dynamics explains, [[]]

]] Dynamics Reply at 10 (citing Samsung Sub. at 13; RX-1675C (Apsel) at Q/A 80 ([])), Q/A 316 ([])). Dynamics further explains that [[]]

PUBLIC VERSION

]] and [[]] *Id.* (citing CX-1199C (Zatkovich) at Q/A 88; RX-1684C (Prasad) at Q/A 64; RX-1674C (Goldberg) at Q/A 46). Dynamics also explains that [[

]] *Id.* (citing CX-1199C (Zatkovich) at Q/A 88; RX-1684C (Prasad) at Q/A 64; RX-1674C (Goldberg) at Q/A 46). The Commission agrees with Dynamics’ analysis on this point.

Accordingly, the Commission affirms the ALJ’s finding that “the Accused Products meet the limitation ‘wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data’ along with ‘analog waveform.’” ID at 56. The ID found that all other limitations of claims 1 and 7 were satisfied, and therefore, the Commission affirms the ID’s finding that Samsung’s accused products infringe claims 1 and 7 of the ’153 patent.

3. *Technical Prong of the Domestic Industry Requirement*

a) Legal Standard

In a patent-based section 337 investigation, a complainant is required to show that an industry in the United States relating to the articles protected by the patent exists or is in the process of being established. 19 U.S.C. § 1337(a)(2). Under Commission precedent, this domestic industry (“DI”) requirement has been divided into (i) a “technical prong” (which requires articles that practice the asserted patent) and (ii) an “economic prong” (which requires certain levels of investments and qualifying activities with respect to the articles protected by the patent, and under section 337(a)(3)(C), having a nexus to the patent itself). *See, e.g., Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op. at 6-7 (Apr. 14,

PUBLIC VERSION

2011). To satisfy the technical prong, a complainant must show that its products practice the asserted patents. *See Crocs, Inc v. Int’l Trade Comm’n*, 598 F.3d 1294, 1306-07 (Fed. Cir. 2010) (discussing 19 U.S.C. § 1337(a)(2)). The test for claim coverage for the purposes of the technical prong is the same as that for infringement. *Id.* (citing *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003)).

b) Analysis: “Analog Waveform”

The ID found that, as with infringement, “Dynamics has only argued the waveform is ‘analog’ under Dynamics’ construction—such that, if the construction is not adopted, Dynamics has failed to carry its burden.” *Id.* at 61. The ID observed that it rejected Dynamics’ argument and that “Dynamics offers no theory for why any waveforms generated and communicated in the DI Products are ‘analog’ apart from its erroneous construction involving frequency encoding.” *Id.* The ID found that “[i]n contrast to infringement, where the record was clear and undisputed, for domestic industry technical prong Dynamics offers only evidence consistent with its erroneous claim construction proposal” and that Dynamics “points to no evidence in its post-hearing briefs regarding the shape of any alleged waveforms” with respect to its DI products and ““does not cite any evidence of what the waveform in the alleged DI products looks like.”” *Id.* (quoting RX-1675C (Apsel) at Q/A 358). Thus, the ID found that Dynamics failed to establish the technical prong.

The Commission has determined to affirm the ID’s finding that Dynamics failed to adduce sufficient evidence to establish that its DI products meet the “analog waveform” limitation. Unlike infringement, where the adduced evidence shows that Samsung’s accused products transmit a real-world square wave having an analog waveform, Dynamics has submitted no evidence to show that its accused products generate or communicate an analog

PUBLIC VERSION

waveform. And this lack of evidence is of Dynamics' own making. Indeed, Dynamics was well aware of Samsung's proposed construction, and while Samsung sought to exclude real-world square waves from that construction, nothing prevented Dynamics from presenting a domestic industry theory based upon Samsung's proposed construction. Dynamics, however, concentrated all its efforts in attempting to show both infringement and technical prong of DI under its proposed construction, *i.e.*, "a waveform that conveys information in a non-binary manner." The ALJ rejected Dynamics' construction and largely adopted the construction proposed by Samsung. Thus, as the ALJ found, the record does not contain enough evidence to conclude that the DI products practice the '153 patent.

Dynamics relies heavily on "early oscilloscope readings shown in Dynamics' Chief Engineer James Workley's History of Card Technical Development" (reproduced below) and contends that the graph is "representative of the output of all DI products, as Mr. Workley testified." Dynamics Sub. at 13-14 (citing RX-42C (Workley Dep.) at 218:2-25).⁹

⁹ Although Mr. Workley submitted a witness statement and testified at the hearing, Dynamics failed to elicit testimony sufficiently explaining how its DI products operate during either of these opportunities. *See generally* CX-1198C (Workley WS); Tr. (Workley) 30–102.

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CX-155C (the “History” document) at 26. The ALJ, however, considered this evidence and appropriately found it insufficient. ID at 62. Specifically, the ID noted that “[t]he author of the document in which this figure and explanation appear, Mr. Workley, testified at his deposition that the ‘input to the wave-shaping circuit’ is ‘digital,’ and that after wave-shaping the signal is ‘analogue,’ and further agreed that the wave-shaping circuit [[

]] *Id.* (quoting RX-42C at 32:4-21). The ALJ, however, found that “[m]ore context is needed to fully understand this evidence.” *Id.* The Commission agrees with the ALJ.

Moreover, it is unclear whether this evidence actually reflects the design of any of the alleged DI products at issue here. The History document states that “[t]he picture below show[s] the oscilloscope waveforms for our first circuit that controlled the wave shape driving the coil.” CX-155C at 25-26. Dynamics points to Mr. Workley’s deposition testimony that “these early designs were implemented into the DI products, which involve the same functionality, albeit with different versions of the same parts (*i.e.*, the DI products may use a different [[]] from the early designs, but those [[]] provide the same functionality in the same way the prior versions

PUBLIC VERSION

did)” and that “the [[]] described in CX-0013C employ the same process for communicating with a read head that the current DI products employ.” Dynamics Sub. at 14 (citing RX-42C (Workley Dep.) at 218:2-25). Dynamics, however, admits that “the DI products may use a different [[]] from the early designs,” and the Commission finds that there is no evidence, besides Mr. Workley’s unsupported deposition testimony, that the actual [[]] used by Dynamics “provide the same functionality in the same way the prior versions did” and meet the claim limitation. For instance, while Mr. Workley testified that “the circuitry is very much the same,” he admitted that “[i]t may have been modified slightly.” RX-42C (Workley Dep.) at 218:21-25. As Samsung argues, “[t]here is no evidence that the [[]], uses the same design as this breadboard,” and “[e]ven if the designs were the same, the ‘History’ document does not provide sufficient details on how the amplitude of the output waveform changes.” Samsung Reply at 15.

To carry its burden, Dynamics should have produced evidence and analysis of a current DI product. For example, an oscilloscope reading from a current DI product, like the reading from the “Historical” document, would have sufficed to show the shape of the waveform. Yet, the record does not contain such evidence. Dynamics argues that “[s]imilar to the oscilloscope readings from 2015 that Samsung admits are representative of the output of all Accused Products . . . early oscilloscope readings shown in Dynamics’ Chief Engineer James Workley’s History of Card Technical Development are representative of the output of all DI products, as Mr. Workley testified.” Dynamics Sub. at 13. However, unlike the oscilloscope readings from Samsung’s accused products from 2015, Dynamics has not shown that the reading from the Dynamics’ History document depicts its current products. Indeed, while the evidence presented by

PUBLIC VERSION

Dynamics is heavily contested, no one disputes the oscilloscope evidence of Samsung's accused products.

In sum, the Commission finds that the ID did not err in finding that Dynamics failed to show that its DI products practice the '153 patent.

4. Obviousness of Claims 1 and 7 – Gutman in View of Shoemaker

a) Legal Standard

“Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). The underlying factual determinations include the so-called “Graham factors”: “(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness.” *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966). The Supreme Court has held that the critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-21 (2007). In so holding, the Court rejected the Federal Circuit's rigid teaching-suggestion-motivation test. *Id.* While the Court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does,” it described a more flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

PUBLIC VERSION

Id. at 418. In turn, the Federal Circuit has held that where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device . . . and would have had a reasonable expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 399. An obviousness determination should also include a consideration of “secondary considerations,” if evidence is presented in the case as to “commercial success, long felt but unsolved needs, failure of others, etc., which might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Graham*, 338 U.S. at 17-18; *see Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 837 (Fed. Cir. 2015).

b) Analysis

As noted above, the Commission determined to review the ID’s finding that the combination of Gutman and Shoemaker fails to render the asserted claims of the ’153 patent obvious. In its notice of review, the Commission asked the parties the following questions:

Given Gutman’s disclosure that “communication of data by the card of the current invention is independent of movement of the card or placement of the card within the magnetic card reader” (Gutman at col.17 ll.10-13), please explain why or why not one of ordinary skill would be motivated to combine Shoemaker with Gutman.

While Gutman states that “no ‘swiping’ movement is necessary,” the disclosure “allows users to perform the familiar ‘swiping’ movement while using the card 200 of the present invention for users that have become accustomed to the ‘swiping’ movement of the card 106.” Gutman at col.16 l.66 - col.17 l.4. Please discuss the legal significance of this disclosure to an obviousness inquiry in light of Samsung’s proposal to combine Gutman with Shoemaker to solve the so-called directionality problem associated with “swiping.”

86 Fed. Reg. 27652-53 (May 21, 2021).

PUBLIC VERSION

The ID found that Samsung failed to show that a combination of Gutman and Shoemaker would have rendered asserted claims 1 and 7 of the '153 patent obvious to a person of ordinary skill in the art at the time of the invention. ID at 69. The ID noted Samsung's argument that Gutman discloses all limitations in claim 1 except for the "plurality of digital representations" limitation (*e.g.*, multiple representations of the same track data) and that Shoemaker supplies this subject matter by disclosing "use of forward and reverse representations of tracks." *Id.* at 65 (citing Shoemaker at 14:65-15:6; RX-1677C (Lipoff) at Q/A 484).

The ID found that "Samsung's proposed combination is not persuasive, particularly in view of the differences between the claimed invention and the prior art." ID at 66 (citing *Scanner Techs.*, 528 F.3d at 1379). Specifically, the ID stated that "it is not clear that Gutman would benefit from swipe sensors that trigger packaging or preparing track data in forward and reverse directions (*i.e.*, the imported feature of Shoemaker)" because "Gutman discloses its invention as functioning independent of the swiping motion of traditional payments cards." *Id.* Thus, the ID concluded that "while Gutman's invention 'may still be 'swiped,' the disclosure is clear—'no 'swiping' movement is necessary' because 'communication of data by the card of the current invention is independent of movement of the card or placement of the card within the magnetic card reader.'" *Id.* at 67-68 (citing Gutman (RX-877) at 16:64-17:13). Next, the ID found that "even if Gutman were in some way to benefit from Shoemaker's ability to detect swiping direction, Samsung admits that Shoemaker does not disclose storing forward and reverse

PUBLIC VERSION

track data representations in memory.” ID at 68.¹⁰ Finally, the ID observed that Dynamics offers no evidence of secondary considerations of non-obviousness. *Id.*

Samsung argues that one of ordinary skill in the art would have been motivated to use Shoemaker’s multiple representations in Gutman’s card despite Gutman’s disclosure that “communication of data by the card of the current invention is independent of movement of the card or placement of the card within the magnetic card reader.” Samsung Sub. at 25 (citing Gutman at 17:10-13). As Samsung explains, “Shoemaker recognized in 2006—nine years after Gutman but nearly five years before the date of the alleged invention—that certain card readers will only process magnetic stripe track data if it is presented in the order that the card reader expects (forward or reverse), and will fail to process data presented in the wrong direction” and that “motivation to combine is to be evaluated as of the time of the alleged invention—2011—and not earlier.” *Id.* at 26 (citing *KSR*, 550 U.S. at 420 (“Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.”); *Boston Scientific SciMed, Inc. v. Iancu*, 811 F. App’x 618, 624 (Fed. Cir. 2020) (finding motivation to combine because relevant problem was well-known prior to the priority date of patent-in-suit)).

According to Samsung, “[t]o address this problem, Shoemaker teaches using sensors to detect the direction in which its card is swiped, and formatting the data accordingly.” *Id.* Samsung contends that an ordinarily skilled artisan “would have been motivated to incorporate Shoemaker’s swipe direction dependent forward and reverse tracks in Gutman’s device to permit

¹⁰ Rather, Samsung argued that “such memory storage (as opposed to on-the-fly creation) would have further been obvious to one of ordinary skill in the art.” *Id.* (RX-1677C (Lipoff) at 458-459, 486).

PUBLIC VERSION

Gutman's magnetic emulator to work in all types of card readers, including those that require track data to be presented in an order that is consistent with the direction in which cards are swiped." *Id.* at 27 (citing Tr. (Lipoff) at 711:14-712:6; RX-1677C (Lipoff) at Q/A 486).

Samsung argues that "[i]mplementing this functionality in Gutman's device is 'the mere application of a known technique to a piece of prior art ready for the improvement.'" *Id.* (citing *KSR*, 550 U.S. at 417).

Dynamics responds that "[o]ne of ordinary skill in the art would not have been motivated to combine Shoemaker with Gutman." Dynamics Sub at 27. Dynamics explains that "Samsung's proposed combination relies entirely on a supposed directionality problem associated with swiping" but that "Gutman, however, has nothing to do with the alleged directionality problem because data is transmitted from Gutman's device to the read head as soon as Gutman's device is inserted into the trough of the magnetic stripe card reader." *Id.* (citing Gutman at 17:4-10 ("Additionally, since the conductor 204 runs substantially the width of the card, the placement of the card along the 'swipe' direction in the magnetic card reader is not critical for operation with the magnetic card reader 100 as long as a portion of the length of the card is inserted in the slotted portion 104 of the magnetic card reader 100.")). Thus, according to Dynamics, "swiping Gutman through a magnetic stripe card reader has no effect on Gutman's operation nor on the operation of the magnetic stripe reader, other than potential wear and tear damage to Gutman's device and the card reader, which is one of the reasons why Gutman expressly warns against swiping." *Id.*

The Commission has determined to reverse the ID's finding. A review of the entirety of Gutman and Shoemaker makes clear that an ordinarily skilled artisan would have been motivated to combine them, and their combination would have rendered the asserted claims of the '153

PUBLIC VERSION

obvious to a person of ordinary skill in the art at the time of the invention. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 1093-94 (Fed. Cir. 1985) (“The well established rule of law is that each prior art reference must be evaluated in its entirety, and that all of the prior art must be evaluated as a whole.”), *vacated on other grounds*, 475 U.S. 809 (1986); *see also In re Wesslau*, 353 F.2d 238, 241 (C.C.P.A. 1965) (“It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.”). As noted above, the ID gave two main reasons for finding that an ordinarily skilled artisan would not be motivated to combine the references. First, the ID found that because “Gutman discloses its invention as functioning independent of the swiping motion of traditional payments cards,” “it is not clear that Gutman would benefit from swipe sensors that trigger packaging or preparing track data in forward and reverse directions (*i.e.*, the imported feature of Shoemaker).” ID at 65. Second, the ID found that “even if Gutman were in some way to benefit from Shoemaker’s ability to detect swiping direction, Samsung admits that Shoemaker does not disclose storing forward and reverse track data representations in memory” but discloses on-the-fly creation. ID at 68.

With respect to the ID’s first reason, the Commission finds that, while the focus of Gutman is a device that functions independently of the swiping motion of traditional payments cards, the section of Gutman upon which Samsung relied specifically states that “since the conductor 204, in the preferred embodiment, runs substantially the width 201 of the card, the card of the present invention may still be ‘swiped’ through a magnetic card reader” and that “[t]his allows users to perform the familiar ‘swiping’ movement while using the card 200 of the present invention for users that have become accustomed to the ‘swiping’ movement of the card

PUBLIC VERSION

106.” Gutman at 16:64-17:3. Thus, this is not a situation where the disclosure teaches away from swiping. *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (“A reference does not teach away, however, if it merely expresses a general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.”). Rather, the disclosure specifically discloses swiping for “individuals that have become accustomed to the ‘swiping’ movement of the card.” Gutman at 16:64-17:3. Indeed, Gutman is specifically designed to accommodate swiping and states that “the conductor 204, in the preferred embodiment, runs substantially the width 201 of the card.” Gutman at 17:64-66, FIG. 2.

Dynamics contends that “Gutman discourages swiping entirely in order to prevent damage to the card and the card readers.” Dynamics Sub. at 37. For support, Dynamics cites the following from Gutman: “First, cards 106 tend to wear out and become unreliable after repeated use. For example, the magnetic material of the magnetic stripe 110 is subject to physical damage from external hazards, degradation of its magnetic qualities over time, and it can be affected by external magnetic fields.” *Id.* at 34 (citing Gutman at 2:9-13). However, as Samsung notes, and the Commission agrees, “Gutman’s solution to this problem was not to eliminate swiping, but to use a magnetic emulator below the surface of Gutman’s card that could be damaged during swiping.” Samsung Sub. at 35. The relevant portion of Gutman provides:

the card 400 comprising the conductor 408 is a much more durable and reliable medium for initiating transactions with the magnetic card reader 100. With the invention, there are no problems with losing magnetic quality of the magnetic stripe 110 on a card 106 (see FIG. 1). The conductor 408 can be embedded deeply into the card 400 thereby protecting the conductor 408 from the external elements and physical damage. On the other hand, the conventional magnetic stripe 110 typically resides near the outer surface of the conventional magnetic stripe card and can be very susceptible to physical damage or external hazards.”

PUBLIC VERSION

Gutman at 11:20-30. Thus, even though Gutman expresses a preference for not swiping, Gutman does not teach away from swiping. *See DePuy Spine*, 567 F.3d at 1327. Rather, Gutman expressly teaches swiping for “individuals that have become accustomed to the ‘swiping’ movement of the card” and provides a “more durable and reliable medium” for doing so. Gutman at 16:64-17:3; 11:20-30.

Regarding the ID’s second reason (“Shoemaker does not disclose storing forward and reverse track data representations in memory”), while Shoemaker discloses on-the-fly creation and does not disclose storing forward and reverse track data representations in memory, as Samsung notes, Gutman is a memory-based system that discloses storage of data in memory. RX-1677C (Lipoff) at Q/A 489; Gutman at 10:25-34, 11:4-13, 12:1-5, 14:16-24, 15:23-35). It would have been a routine step for a person of ordinary skill in the art to store Shoemaker’s forward and reverse track data representations in Gutman’s memory. *See* RX-1677C (Lipoff) at Q/A 458-459, 485-486; *B/E Aerospace, Inc. v. C&D Zodiac, Inc.*, 962 F.3d 1373, 1379-80 (Fed. Cir. 2020). Accordingly, the Commission finds that this limitation is disclosed.

In sum, there appears to be no dispute that Gutman discloses all of the limitations in claim 1 except for storing multiple representations of the same track data (“a plurality of digital representations of said at least one track of magnetic stripe data.”). ID at 65. There is also no dispute that both Gutman and Shoemaker disclose payment cards using magnetic emulators. There is also no credible dispute that Shoemaker discloses the use of multiple representations of the same magnetic stripe track, specifically in the form of forward and reverse versions of the track, where the direction of the transmitted track is based on a detected swipe direction. Shoemaker (RX-0884) at 14:54-15:6. The only dispute is whether one of ordinary skill would be motivated to combine the references. In our view, such motivation exists.

PUBLIC VERSION

Shoemaker recognized that for certain card readers, the data must be presented in a specific direction in order for the data to be read, and thus discloses multiple representations of the same magnetic stripe track, “specifically in the form of forward and reverse versions of the track, where the direction of the transmitted track is based on a detected swipe direction.” Shoemaker at 14:54-15:6; Samsung Pet. at 32. Samsung’s expert, Mr. Lipoff, testified that an ordinarily skilled artisan “would have been motivated in 2011 to incorporate Shoemaker’s forward and reverse tracks into Gutman to permit Gutman’s magnetic emulator to work in all types of card readers, whether they require forward tracks or reverse tracks.” RX-1677C (Lipoff) at Q/A 458-459, 484-489. Mr. Lipoff explained that one of ordinary skill “looking at Gutman through the lens of Shoemaker would have been motivated to implement Shoemaker’s forward/reverse tracks by storing them in Gutman’s device (Gutman is already a memory-based architecture) because, without it, Gutman’s device would generate an error if it were used in a reader that expected the track data to be in the opposite direction to that stored in Gutman’s memory.” RX-1677C (Lipoff) at Q/A 459, 486; Samsung Pet. at 32.¹¹ Further, Mr. Lipoff testified that implementing Shoemaker’s forward/reverse track scheme in Gutman would have been “well within the skill of a POSITA[.]” RX-1677C (Lipoff) at Q/A 485; *KSR*, 550 U.S. at 427 (finding obviousness where the combination was “within the grasp of a person of ordinary skill in the relevant art”). Thus, an ordinarily skilled artisan would understand that Shoemaker’s forward and reverse track data representations would be stored in the Gutman device’s memory. RX-1677C (Lipoff) at Q/A 459, 486.

¹¹ We note that Dynamics’ expert Mr. Zatkovich did not address or rebut Mr. Lipoff’s testimony set out in this paragraph.

PUBLIC VERSION

Gutman’s statement that “no ‘swiping’ movement is necessary” because “communication of data by the card of the current invention is independent of movement of the card or placement of the card within the magnetic card reader” does not compel otherwise. Gutman at 16:64-17:13; ID at 67-68. As Samsung observes, “Shoemaker expressly and specifically disclosed implementing swipe-direction functionality in an embodiment that does not require swiping,” demonstrating that Gutman’s statement that “no ‘swiping’ movement is necessary” would not deter one of ordinary skill to combine the references. Samsung Sub. at 32 (citing Shoemaker at 8:47-51). Specifically, Samsung points to Shoemaker’s description of “an embodiment that communicates ‘a time-varying serial data stream’ and so does not need to be swiped in order to communicate with a magnetic stripe reader: ‘Since data values in the serial data stream vary as a function of time and not as a function of the swiping speed, *the data pattern can be reliably provided even if the swiping velocity is zero* or if the swiping velocity is erratic.’” *Id.* at 32 (citing Shoemaker at 8:47-51) (emphasis by Samsung).

Dynamics does not dispute this. Rather, Dynamics makes two arguments in response. First, Dynamics argues that Samsung makes this argument for the first time in its response to the Commission’s question and asks the Commission to reject it as untimely. Second, Dynamics argues that “the Commission should . . . note that the embodiment Samsung relies on is shown in FIG. 7, and that Shoemaker states ‘the data pattern can be reliably provided even if the swipe speed is zero’ – a situation in which there is NO swipe direction” and that “that embodiment of Shoemaker appears virtually identical to Gutman because the swipe sensor is not mentioned, and, therefore, swipe direction cannot be determined.” Dynamics Reply at 18 (citing Shoemaker at 8:47-50). Dynamics states that “Shoemaker’s swipe direction detector embodiments, on the

PUBLIC VERSION

other hand, are described in connection with FIG. 13 and require swipe movement in order to determine swipe direction.” *Id.* (citing Shoemaker at 12:30-33 (see step 1302)).

Regarding the first argument, Dynamics is correct that Samsung makes this argument for the first time in its submission. However, Federal Circuit precedent makes clear that the obviousness inquiry requires that “each prior art reference must be evaluated in its entirety.” *Panduit*, 774 F.2d at 1093-94. Thus, it would be error for the Commission to ignore Shoemaker’s disclosure of implementing swipe-direction functionality in an embodiment that does not require swiping and thereby fail to evaluate the entirety of the Gutman and Shoemaker references.

Dynamics’ second argument is also unpersuasive. Dynamics does not appear to dispute the understanding of the disclosure cited by Samsung, *i.e.*, that Shoemaker discloses an embodiment where there is no swiping. Dynamics states that the embodiment Samsung relies on is shown in Fig. 7, and that Shoemaker states “the data pattern can be reliably provided even if the swipe speed is zero’ – a situation in which there is NO swipe direction” akin to Gutman. *See* Dynamics Reply at 18. Dynamics then states that Shoemaker’s swipe direction detectors are disclosed in Fig. 13 and require swipe movement in order to determine swipe direction. *Id.* Shoemaker, however, claims an invention (claim 21)¹² that includes both the embodiments of

¹² Claim 21 recites:

An active card compatible with a card reader, said card reader representing one of a card reader that is configured to read statically implemented magnetic stripe cards and a bar code reader that is configured to read statically printed bar codes, said active card being configured to exchange data with said card reader, comprising:
a card base;

dynamically reconfigurable data providing means attached to said card base, said dynamically reconfigurable data providing means being configured to provide said card reader a first data

PUBLIC VERSION

Figs. 7 and 13. Using Dynamics' own understanding, Shoemaker in claim 21 recites a limitation "virtually identical to Gutman" as well as a "swiping" limitation, combining those two embodiments. Thus, Dynamics' argument that Samsung relies upon the wrong embodiment of Shoemaker ignores the disclosure of claim 21 which combines the embodiments of both Figures 7 and 13.

The Commission finds that the ID erred in concluding that an ordinarily skilled artisan would have had no motivation to include Shoemaker's forward and reverse tracks in Gutman's magnetic emulation card. And while Shoemaker teaches dynamically creating tracks because of potential fraud issues (Shoemaker at 5:3-8, 5:28-31), Gutman discloses storage of data in memory. The evidence indicates that it would have been a routine step for one of ordinary skill in the art

pattern for a first transaction that is different from a second data pattern for a second data transaction, said second data pattern also provided to said card reader by said dynamically reconfigurable data providing means, ***wherein at least one of said first data pattern and said second data pattern represents a time-varying serial data stream, wherein each data value in said time-varying serial data stream is a function of time***; and

a swipe direction detector coupled with said dynamic reconfigurable data providing means, ***wherein each of said first data pattern and said second data pattern changes responsive to a swipe direction of said active card with respect to said card reader***, said swipe direction ascertained via said swipe direction detector.

Shoemaker (RX-884) at 17:32-57 (Claim 21) (emphasis by Samsung).

to store the forward and reverse tracks of Shoemaker in memory. *See* RX-1677C (Lipoff) at Q/A 458-459, 485-486.^{13, 14}

B. The '100 Patent

For the '100 patent, the Commission determined to review the ID's finding as to whether Doughty in combination with VivoTech would not have rendered claim 4 obvious to a person of ordinary skill in the art at the time of the invention and whether Samsung waived that issue. The Commission also reviewed whether claims 4 and 6 are infringed and whether the domestic industry requirement is satisfied.

1. Infringement of Claims 4 and 6

In the conclusions of law, the ID states that "Samsung directly infringes claims 1, 12, and 18 of the 100 patent." ID at 183-84. The Commission notes that the ID also found infringement as to claims 4 and 6 (only as to certain products) and revises the conclusion of law section accordingly. ID at 83-84.

¹³ Apart from the teaching away argument, the Commission notes that Dynamics did not present any secondary considerations evidence or argument for the '153 patent. *See generally* Dynamics Post-Hr'g Br. at 36-41 (contesting obviousness without discussing secondary considerations); Dynamics Post-Hr'g Reply at 19-25 (apart from teaching away, "Dynamics does not contend that other secondary considerations should be considered for the '153 patent."); *Geo. M. Martin Co. v. All. Mach. Sys. Int'l LLC*, 618 F.3d 1294, 1304 (Fed. Cir. 2010) ("Secondary considerations of non-obviousness must be considered *when present*." (emphasis added)). Accordingly, the Commission finds that no evidence of secondary considerations supports a non-obviousness finding.

¹⁴ Commissioner Johanson would affirm the ALJ in this regard. In his view, there is not clear and convincing evidence that supports a finding of obviousness. There is insufficient evidence that combination of the teachings of the references would lead one of skill in the art to the storage of multiple representations, which is not taught by either reference, rather than the "on the fly" creation taught by Shoemaker (*see* Respondents' Post-Hearing Reply Brief at 18).

2. *Obviousness of Claim 4 – Doughty in View of VivoTech*

The ID found that “Samsung tersely asserts that ‘to the extent claim 1 is obvious’ in view of Doughty combined with other references, ‘so is claim 4,’ [but] this assertion only appears in its reply brief” and so “Dynamics therefore did not have an opportunity to rebut it, and it will not be considered further.” ID at 109. Although the ID found claim 4 infringed, not invalid, and that Dynamics established a domestic industry as to the ’100 patent, the ID stated that there is no violation of section 337 with respect to the ’100 patent. For the reasons set forth below, the Commission finds claim 4 invalid as obvious and finds no violation as to that claim.

Samsung, in its contingent petition for review, asserted that at the hearing it “argued that claims 1 and 4 of the ’100 patent are both anticipated by Doughty, or in the alternative, obvious based on the teachings of VivoTech” and that “[i]n disputing anticipation of these claims, Dynamics contended that only a single claim element was missing from Doughty, element 1[c]¹⁵ of the ’100 patent.” Samsung Pet. at 72. According to Samsung, “[a]ll other elements of claims 1 and 4—including the ‘portable telephonic device’ limitation of claim 4—were undisputed by Dynamics” and that “Dynamics conceded in its own brief that Doughty discloses incorporating its magnetic field generator’ substrate into ‘personal communications devices’ such as “a telecommunications device.” *Id.* at 72-73. Samsung added that the “ID expressly found that the only element of claims 1 and 4 missing from Doughty was element 1[c] above.” *Id.* at 73 (citing ID at 102-104).

¹⁵ Element 1[c] recites “wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head.”

PUBLIC VERSION

Samsung further argued that “[i]n its alternative obviousness argument, Samsung contended that the only allegedly missing element of claims 1 and 4—element 1[c]—was obvious based on Doughty in combination with VivoTech” and that “Samsung’s post-hearing brief took a consistent approach to all of its obviousness arguments, only addressing the allegedly missing limitations in the obviousness sections of its brief, rather than restating or re-explaining the undisputed limitations already addressed in the anticipation sections.” *Id.* According to Samsung, the ID agreed “that element 1[c] was obvious based on Doughty in combination with VivoTech, and found claim 1 to be obvious.” *Id.* (citing ID at 109-110). Samsung argued that “because element 1[c] was also the only allegedly missing element from claim 4, the ID should have found claim 4 (which was not disputed to be disclosed) obvious as well.” *Id.*

Dynamics argued that the “ID properly declined to consider Samsung’s assertion that claim 4 of the ’100 patent was obvious in view of Doughty combined with other references because the assertion appeared only in Samsung’s post-hearing reply brief, and Dynamics therefore did not have the opportunity to rebut it.” Dynamics Resp. at 70 (citing ID at 109). Dynamics asserted that the “Ground Rules governing the conduct of the Investigation clearly required Samsung to raise – before its post-hearing reply brief – any invalidity defenses it wanted to preserve.” *Id.* at 70-71. Dynamics argued that “Samsung waived any assertion that claim 4 was obvious over Doughty” as a result. ID at 71.

The ID found that Samsung did not specifically argue, in its pre- or post-hearing brief, obviousness of claim 4 based upon Doughty and VivoTech. ID at 109. Based on the record, the Commission finds that, in essence, Samsung made this argument. *See* Respondents’ Post Hearing Brief at 96-97; Respondents Post Hearing Reply Brief at 55; ID at 138. The

PUBLIC VERSION

Commission thus rejects Dynamics' waiver argument. The Commission further finds Dynamics' argument that it "did not have the opportunity to rebut [this argument]" disingenuous. Dynamics Resp. at 70 (citing ID at 109). Dynamics has had ample opportunity to, and, indeed, did extensively discuss both Doughty and VivoTech. *See, e.g.*, Complainant Dynamics Inc.'s Initial Post-Trial Brief at 54-64. Moreover, it appears that the ALJ's statement to the contrary may have been an oversight because in considering whether a similar claim in the '631 patent was obvious, the ID stated that claim 4 of the '100 patent had been shown to be obvious:

As for claim 4 [of the '631 patent] and 'wherein the apparatus is a portable telephonic device,' Samsung refers to its discussion of the similar limitation in the 100 patent. RRB at 55. Dynamics refers similarly. CIB at 86-87; CRB at 51. As determined, Samsung has shown Doughty, on its own, discloses placing a magnetic emulator in a personal telecommunications device. RX-0283 at [0048]. Accordingly, Samsung has shown claim 4 of the 100 patent to be obvious over Doughty and VivoTech.

ID at 138.

The Commission finds claim 4 invalid because the evidence presented shows that it was obvious at the time of the invention to a person of ordinary skill in the art in light of Doughty in combination with VivoTech. Claim 4 recites: "The device of claim 1, wherein the device is a portable telephonic device." '100 patent at 14:58-59. Dynamics admits that Mr. Lipoff, Samsung's expert, contended that Doughty disclosed the limitations of claim 4. Dynamics Resp. at 72; RX-1677C (Lipoff) at Q/A 249 and RDX-3083. Dynamics also admits that Mr. Lipoff contended that claim 1 was obvious over Doughty combined with VivoTech. Dynamics Resp. at 72 (citing Tr. (Lipoff) at 729:18-730:3 (referring to Mr. Lipoff's witness statement at Q/A 245, which concerned claim 1)). As Samsung notes, the only limitation that VivoTech supplied to Doughty was the claim 1[c] limitation: "wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a

PUBLIC VERSION

quarter of an inch from the read-head.” Taken together, the record evidence shows that a combination of Doughty and VivoTech renders claim 1 obvious as the ID found, and also renders claim 4 obvious since Doughty undisputedly discloses the additional limitation.

In sum, there is no dispute that Doughty discloses the “wherein the device is a portable telephonic device” of claim 4. As discussed above, the ID found that the combination of Doughty and VivoTech discloses all the limitations of claim 1, from which claim 4 depends. Further, as Samsung notes, “Dynamics conceded in its own brief that Doughty discloses incorporating its magnetic field generator’ substrate into ‘personal communications devices’ such as “a telecommunications device.” Samsung Pet. at 72-73. Thus, a combination of Doughty and VivoTech also renders claim 4 obvious.¹⁶

3. *Domestic Industry*

For the ’100 patent, the ID found the technical prong satisfied only as to claim 1, but subsequently concluded Dynamics satisfied the domestic industry requirement. ID at 88, 158, 183. The ID, however, also found claim 1 invalid. ID at 99, 184. The Commission determined not to review the invalidity finding. However, the Commission determined to review the domestic industry finding because this requirement cannot be satisfied by a complainant that practices an invalid patent claim, nor can the economic prong findings relate to articles that practice an invalid patent claim. *Certain Integrated Circuits and Products Containing the Same*, Inv. No. 337-TA-1148, Comm’n Op. at 12 (Dec. 30, 2020) (“Where the technical prong is otherwise met because the DI claims read on the DI products, but the DI claims are invalid, there

¹⁶ Commissioner Johanson would affirm the ALJ’s finding that Respondents failed to carry their burden of showing that claim 4 of the ’100 patent is obvious over Doughty in view of VivoTech as Respondents elected not to assert this argument in their Pre-Hearing and Post-Hearing Briefs. *See* Respondents’ Pre-Hearing Brief at 110–112; *see also* Respondents’ Post-Hearing Brief at 99–100.

PUBLIC VERSION

can be no violation because the domestic industry articles are not protected by the patent.”). Accordingly, the Commission has determined to reverse the ID’s finding that the domestic industry requirement is satisfied as to the ’100 patent.

C. The ’545 Patent: Domestic Industry

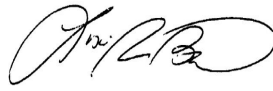
With respect to the ’545 patent, the Commission has determined to take no position on the ID’s findings that Dynamics established a domestic industry in the process of being established as to the technical prong, but failed to show a domestic industry in the process of being established as to the economic prong. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984).

IV. CONCLUSION

Consistent with the analysis above, the Commission has determined, for the ’153 patent, to (1) construe the claim limitation “analog waveform” to mean “a wave shape whose amplitude changes in a continuous fashion” that includes so-called real-world square waveforms; (2) affirm the ID’s finding that the accused Samsung Products infringe the asserted claims; (3) affirm the ID’s finding that Dynamics failed to adduce sufficient evidence to establish that its DI products practice any claims of the patent; and (4) reverse the ID’s finding that the combination of Shoemaker and Gutman fails to render the asserted claims obvious. For the ’100 patent, the Commission has determined to (1) reverse the finding Samsung failed to show that Doughty in combination with VivoTech renders claim 4 obvious; (2) clarify that claims 4 and 6 are infringed; and (3) find the domestic industry requirement not met because the domestic industry claim has been found invalid. For the ’545 patent, the Commission has determined to take no position on the ID’s domestic industry findings. Accordingly, the Commission finds that there has been no violation of section 337 in this investigation.

PUBLIC VERSION

By order of the Commission.

A handwritten signature in black ink, appearing to read 'L.R. Barton', enclosed within a large, loopy oval shape.

Lisa R. Barton
Secretary to the Commission

Issued: July 27, 2021

In the Matter of

**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

Investigation No. 337-TA-1170

SEPARATE VIEWS OF VICE CHAIR RANDOLPH J. STAYIN

The Commission Opinion as to the '153 patent highlights the risks associated with construing claims towards the end of the investigation, which can result in fitting claims to the evidence of infringement rather than the intrinsic record, and denying parties a fair opportunity to present their case. For the reasons set forth below, in my view the plain and ordinary meaning of the term “analog waveform” as used in the '153 patent is a “continuous wave with negative and positive peaks.” Pursuant to this construction, I would find the accused products do not infringe the '153 patent. Furthermore, I would find Dynamics presented sufficient evidence to show its products practice this claim term for purposes of the technical prong the domestic industry requirement, or is entitled to remand for the opportunity to supplement the record. As to invalidity, I believe the record does not show clear and convincing evidence of a motivation to combine the Gutman and Shoemaker references, and therefore would affirm the ID’s conclusion that Samsung did not show the '153 patent to be invalid.

I. Construction of “Analog Waveform”

The legal standard for claim construction as articulated in the ID and the Commission Opinion is not in dispute. Nonetheless, applying these principles the parties, the ID, and Commission Opinion reach four different constructions of the term “analog waveform” as used in the '153 patent:

PUBLIC VERSION

Dynamics	Samsung	ID	Comm’n Op.
“a waveform that conveys information in a non-binary manner”	“a wave shape whose amplitude changes in a continuous fashion”	“any construction consistent with the specification must encompass real-world square waves”	“a wave shape whose amplitude changes in a continuous fashion,” but includes real-world square waves

In my view, the ID and Commission Opinion err by adopting a construction of the term “analog waveform” tailored to their infringement analysis, rather than limited to the plain meaning in light of the specification. The intrinsic record demonstrates that the plain and ordinary meaning of “analog waveform” is a “continuous wave with negative and positive peaks.”

Plain and ordinary meaning. I start from the basic principle that “analog” refers to something that is continuous in nature. I agree with the Commission Opinion that the plain and ordinary meaning of “waveform” is the “shape of a wave.”¹ Comm’n Op. at 12.

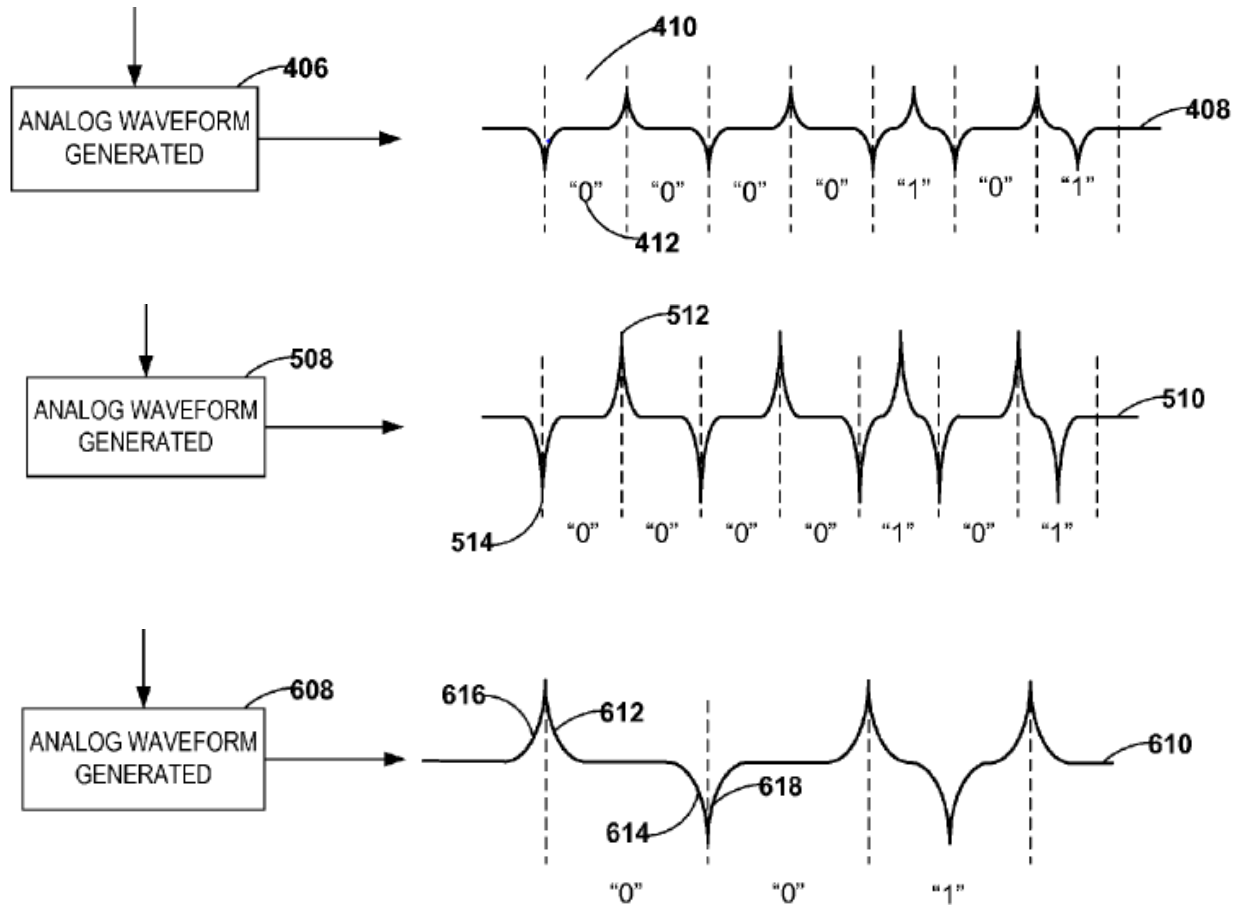
Claims of the ’153 patent. The claims of the ’153 patent describe the function of the “analog waveform” in the context of the invention, and how it is generated. For example:

- The analog waveform is generated by a “waveform generator” “from a digital representation” of magnetic stripe data,” (15:18-20, 16:31-32);
- The analog waveform is “encoded with at least one track of magnetic stripe data,” and can be encoded with two or even three tracks of data (15:16-17, 43-46);
- The analog waveform can be “generated based on a swipe speed,” (15:33-34); and
- The analog waveform is “communicated” by “a magnetic stripe emulator” to complete a transaction, (15:15-19, 16:1-2, 33-34).

¹ See also “Waveform.” Merriam-Webster.com Dictionary, Merriam-Webster, <https://www.merriam-webster.com/dictionary/waveform>. Accessed 13 Jul. 2021 (“a usually graphic representation of the shape of a wave that indicates its characteristics (such as frequency and amplitude) — called also *waveshape*”).

The use of “analog waveform” in the claims does not suggest a meaning apart from the plain and ordinary understanding of “analog waveform” as a wave with a continuous shape.

Specification. Figures 4, 5, and 6 of the '153 explicitly depict three “analog waveforms”:



See '153 patent at 12:59-61 (“In step 406, the magnetic stripe message may be converted from a digital format to an analog format to produce wave form 408.”); *id.* at 13:47-51 (“Successive conversion of all symbols of the selected digital waveform may yield waveform 510 (e.g., as in step 508) having optimized characteristics (e.g., extended amplitudes 512 and 514).”); *id.* at 14:12-17 (“[A]n analog waveform may be generated (e.g., as in step 608) from a digital wave form stored within memory of a card encoded with characteristics (e.g., reduced slew rate 612-618) that may be known to be effective with the magnetic stripe reader as detected in step 604.”). Each of these

PUBLIC VERSION

waveforms are continuous in nature in the sense that the amplitude moves through intervening values when changing, rather than jumping or stepping from one to the next. And each contains negative and positive peaks that may be adjusted by a waveform generator for optimization. *See, e.g., id.* at 13:47-51.

The remainder of the specification provides examples of how the values of an analog waveform might be adjusted based on internal or external parameters. For example, the specification explains that “data symbols retrieved from memory 316 may be modified to generate analog waveforms with better power efficiency (e.g., reduced magnitude and/or reduced slew rate) so as to reduce an amount of power consumed when communicated.” ’153 patent at 12:40-45; *see also id.* at 13:54-62. But none of these discussions suggest the patent uses the term “analog waveform” to mean something other than a continuous wave as depicted in Figures 4-6. Samsung’s proposed construction is consistent with, but overly broad compared to the waves depicted in the specification. And notably, the notation of 1’s and 0’s on each waveform tend to contradict Dynamics’ proposal that the analog waveform conveys information in a non-binary manner.

Prosecution History. The term “analog waveform” was not at issue during prosecution of the ’153 patent. In fact, Dynamics did not dispute that the prior art taught converting a digital representation of magnetic stripe data into an analog waveform. Specifically, the examiner cited Poidomani (US20120205451) as disclosing the conversion from digital to analog waveform for communication to a magnetic stripe reader:

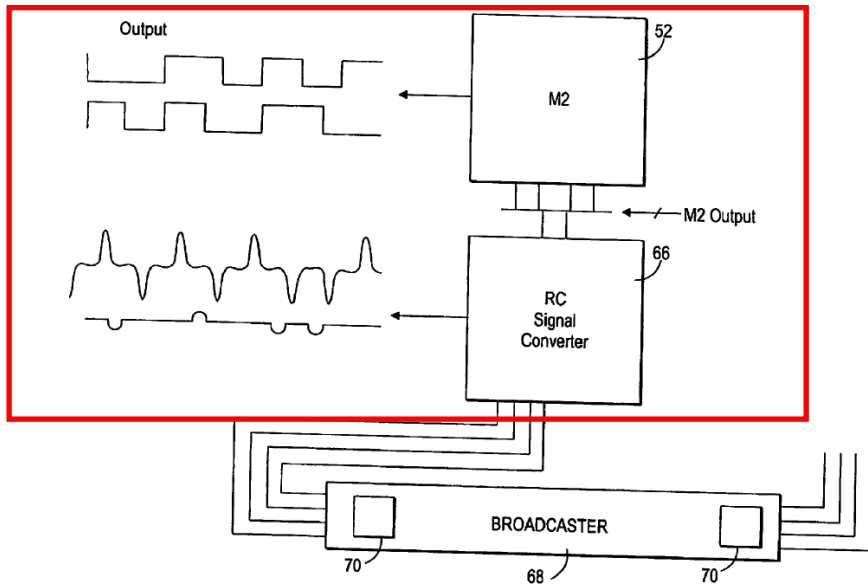


FIG. 32

[0127] FIG. 32 shows an exemplary process for signal conversion which is used to transform the digital square wave output of general processor 52 into the custom waveforms needed to drive broadcaster 68. The digital square wave output of general processor 52 is used to drive the RC network of buffering circuit 66 which produces an analog waveform as output. This is, in turn, used to drive broadcaster 68 which produces magnetic impulses to be received by a magnetic stripe reader.

See CX-0026.0882 (annotation added). Dynamics did not dispute the examiner's citation to Poidomani as showing conversion of a square wave digital signal to an analog waveform. *Id.*; CX-0026.0062. Instead, Dynamics amended the claims to require that the digital signal to be converted is retrieved from a plurality of digital representations of a particular track, a feature it claimed was not taught by the prior art. See CX-0026.0086; CX-0026.0048. Figure 32 of Poidomani highlights the distinction between a digital square wave, with discrete steps and no peaks, and an analog wave, which continuously moves between positive and negative peaks.

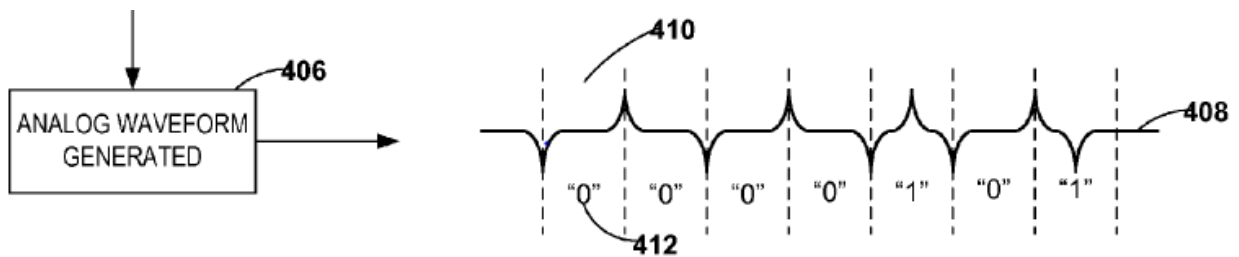
The prosecution history thus reinforces that the plain and ordinary meaning of "analog waveform" as "a continuous wave with positive and negative peaks," and in my view it is unnecessary to review the extrinsic record to construe this term.

Both the ID and Commission Opinion focus on the question of whether a “real-world square wave” is encompassed within a particular proposed construction. ID at 39-40; Comm’n Op. at 14-16. In my view this is a question of infringement, not claim construction.

The ID points 12:59-67 of the patent as describing a “real-world square wave,” finding:

the description of that analog signal apparently corresponds to a square wave, with time on the x-axis and the magnitude of the current on the y-axis, and where the magnitude of the current is “proportional to a digital value of the digital symbol,” that is, except for transitions it is either at its maximum or at zero, assuming the “digital symbol” is either one or zero

ID at 40. Yet Figure 4, which the cited portion of the specification is describing, depicts an analog wave with positive and negative peaks, not a square wave.



Neither of the parties appear to have suggested the specification discloses a square wave, and on review, neither party defended the ID’s characterization of this portion of the specification as describing a square wave (real-world or otherwise). Nothing in the intrinsic record references “real-world square waves,” or suggest they should be a consideration in construing “analog waveform.” Therefore, in my view the ID and Commission Opinion err in their construction of the term “analog waveform.”

II. Infringement

Properly construed, there would be no dispute that the accused products do not infringe claims 1 or 7 of the ’153 patent because the Samsung devices do not generate an “analog waveform.” Figure 6 of RX-121C is a screen shot of an oscilloscope reading representative of accused products: [[

]] the analog waveform in the '153 patent. This is consistent with the testimony of Samsung's engineer, Woosup Lee, who explained that the MST generates a "square wave that has only two discrete values, high or low." Samsung Sub. at 7 (quoting RX-1671C (Lee) at Q/A 30). Dynamics' expert agreed, noting the Samsung square wave "has two discrete levels, high and low, and alternates between them." *Id.* at 8 (quoting Tr. (Zatkovich) at 325:5-8; 207:16-24). MST generates a "discrete," not a "continuous wave," which lacks any peaks. Therefore, I would find no infringement of the '153 patent.

Furthermore, in my view an infringement analysis construing "analog waveform" to necessarily encompass "real-world square waves" is erroneous. In response to Samsung's contention that the term "real-world square wave" as used in the ID is vague, the Commission Opinion defines the term by reference to the oscilloscope reading of the accused products, and

PUBLIC VERSION

concludes that “a real-world square wave results in a Lorentz waveform as disclosed in the ’153 patent.” Comm’n Op. at 21. In my view the MST square wave does *not* generate a Lorentz waveform on the reader head. The second through fifth peaks of the yellow wave in Figure 6 have discrete transitions from zero to the negative/positive amplitude, unlike Figures 4 through 6 of the patent, which show curved transitions on both sides of the peak.

The Commission Opinion relies on the testimony of Samsung’s expert that even for the MST square wave “the transition from one discrete amplitude value to another takes some non-zero amount of time.” RX-121C at 9; Comm’n Op. at 20. Dr. Apsel is simply acknowledging that even digital waveforms require some amount of time to transition between discrete amplitudes. *See* RX-1675C (Apsel) at Q/A 294. It would appear majority opinion holds that “real-world square waves” include a square wave with *any* amount of transition between discrete amplitude values. Such a finding would read digital waves out of existence, and expand the scope of “analog waveform” well beyond what would be understood by a person of ordinary skill.

III. Domestic Industry – Technical Prong

Procedurally, I believe the Commission Opinion errs in faulting Dynamics for failing to present sufficient evidence that its domestic industry products practice the ’153 patent. The parties did not propose constructions for “analog waveform” until requested by the ALJ after the hearing, meaning Dynamics’ only opportunity to present a technical prong case under Samsung’s proposed construction was in its *post-hearing reply brief*. Moreover, the ALJ did not even adopt Samsung’s proposed construction; as a result, the first opportunity for Dynamics to make its case under the construction used in the final initial determination was in its petition for review. I would remand to allow Dynamics the opportunity to show its domestic industry products practice the “analog waveform” as I believe the term should be construed. If, as the Commission holds, the record is

PUBLIC VERSION

insufficient for its purposes, Dynamics should have been given the opportunity to supplement the record on remand.

Nevertheless, I would find remand unnecessary under the majority's approach as the record demonstrates by a preponderance of the evidence that Dynamics' products practice the "analog waveform" limitation of the '153 patent. As construed by the Commission Opinion, Dynamics need only show that its products generate a "real-world square wave" or otherwise produce a Lorentz-type waveform on the reader head. Comm'n Op. at 21.

Dynamics presented the following evidence:

- Testimony from Dynamics' technical expert Ivan Zatkovich that Dynamics' products include a waveform generator in the form of an [[]], which generates an analog waveform from a digital representation of magnetic stripe data. (CX-1199C (Zatkovich) at Q/A 80-81).
- Testimony from James Workley, the Chief Scientist at Dynamics, that Dynamics' products include a waveform generator in the form of an [[]], which generates an analog waveform from a digital representation of magnetic stripe data. (CX-1198C (Workley) at Q/A 64-66).
- An internal Dynamics document titled "History of Card Technical Development," updated in August 2019. (CX-0155C). The document includes a picture of an oscilloscope reading for "our first circuit that controlled the wave shape driving the coil," showing the resulting output signal from the reader head in the form of a Lorentz-type waveform. (CX-0155C.0025-26).

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PUBLIC VERSION

- Deposition testimony from Mr. Workley that the input into the [[]] takes a digital wave, [[]]” and outputs a “waveform that looks just like the waveform coming out of a head from a normal credit card.” (RX-0042C (Workley Dep.) at 32:4-21).
- Deposition testimony from Mr. Workley that the CIBC card uses the wave depicted in the Technical Development document. (RX-0042C (Workley Dep.) at 204:16-23 (referring to CX-0155C.0026)).
- Deposition testimony from Mr. Workley that the newer Dynamics products use a [[]] and the [[]] to create the shaped wave depicted in the Technical Development document. (RX-0042C (Workley Dep.) at 204:24-205:12).
- A document from [[]], dated August 30, 2010, that describes the technical features of the [[]]. (CX-0013C).
- Deposition testimony from Mr. Workley that Dynamics’ newer products use the same process for wave-shaping as described in the [[]] document. (RX-0042C (Workley Dep.) at 218:2-25, 219:2-21).

Samsung does not offer any evidence of its own on this issue; it simply argues there is “insufficient context” for Dynamics’ evidence. The Commission Opinion dismisses Mr. Workley’s deposition testimony as “unsupported.” Comm’n Op. at 26. Mr. Workley—the Chief Scientist at Dynamics since 2015 and an employee of the company since 2009—testified as to the waveforms generated by past and present Dynamics products, and confirmed the documents produced by Dynamics demonstrate the relevant functionality as currently used. In my view the documents and testimony, particularly Mr. Workley’s un rebutted testimony regarding how Dynamics’ current products operated is credible, reliable and probative evidence, sufficient to meet Dynamics’ burden on this issue.

IV. Validity of the ’153 patent

Samsung alleges claims 1 and 7 of the ’153 patent would have been rendered obvious by Gutman (U.S. Patent No. 6,206,293) and Shoemaker (U.S. Patent No. 7,690,580). ID at 64. It appears undisputed that Gutman includes every limitation of claims 1 and 7, except for the requirement that the device have “a plurality of digital representations of said at least one track of

PUBLIC VERSION

magnetic stripe data” stored in the memory of the device. Gutman at 15:22-23 (claim 1). To supply this missing limitation, Samsung relies on Shoemaker, which teaches having multiple representations of a particular track in the form of forward and reverse versions of track data to be used depending on the direction the card is swiped. Shoemaker at 14:65-15:3. Samsung argues, and the Commission Opinion finds, the person of ordinary skill would have been motivated to implement the forward/reverse track data functionality taught by Shoemaker on the card disclosed by Gutman. In my view, the record evidence does not show by clear and convincing evidence that the person of ordinary skill would have been motivated to combine Gutman and Shoemaker in the claimed manner.

“Identifying a motivation to combine the prior art is important because ‘inventions in most, if not all, instances rely on building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.’” *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1357 (Fed. Cir. 2019) (quoting *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–19 (2007)). In my view, the Commission Opinion mistakes overlapping building blocks for evidence of a motivation to combine references seeking to solve distinct problems in the prior art.

Samsung argues that the person of ordinary skill would have been motivated to incorporate the forward/reverse tracks from Shoemaker into the Gutman card “to permit Gutman’s magnetic emulator to work in all types of card readers, including those that require track data to be presented in an order that is consistent with the direction in which cards are swiped.” Samsung Sub. at 27. Likewise, the Commission emphasizes Samsung’s expert’s testimony that without this functionality “Gutman’s device would generate an error if it were used in a reader that expected

PUBLIC VERSION

the track data to be in the opposite direction to that stored in Gutman's memory." Comm'n Op. at 35 (quoting RX-1677C (Lipoff) at Q/A 459, 486; Samsung Pet. at 32).

This purported motivation is belied by Gutman itself. Gutman teaches in one embodiment that the conductor that generates the magnetic field "runs substantially the width of the card" such that "the placement of the card along the 'swipe' direction in the magnetic card reader is not critical for operation with the magnetic card reader *as long as a portion of the length of the card is inserted in the slotted portion of the magnetic card reader.*" Gutman at 17:4-10 (emphasis added). The result of this design is that "communication of data by the card of the current invention is *independent* of movement of the card or placement of the card within the magnetic card reader," and "*no 'swiping' movement is necessary.*" *Id.* at 17:4, 10-13 (emphasis added). In other words, data is transmitted from the Gutman card to the reader as soon as it is inserted into the slot, regardless of whether the user proceeds to swipe the card.²

Samsung explicitly concedes that Gutman's card "does not need to be swiped in order to communicate with a magnetic stripe reader." Samsung Sub. at 31. Samsung's Submission lays out in detail that magnetic field emulators can transmit data to readers without being swiped. *Id.* Nonetheless, Samsung argues "Gutman expressly discloses that it can and likely will be swiped, and would therefore benefit from the improvement described by Shoemaker." *Id.* at 26. This argument simply ignores the portion of Gutman immediately following the discussion of swiping: "communication of data by the card of the current invention is *independent* of movement or the card." Gutman at 17: 10-13. Communication of the data by the Gutman device has *no relation* to

² It is an interesting question whether a reference "teaches away" from swiping by explaining its drawbacks yet accommodating it with the design of the invention, but one that is ultimately irrelevant because the Gutman device communicates data to the read head before any swiping occurs.

PUBLIC VERSION

swiping, thus there is nothing to suggest the Gutman card would have the forward/reverse data problem of a traditional credit card. It is not simply that the Gutman card does not need to be swiped, swiping has no effect on the data transmission.

Samsung and the Commission Opinion stress that Shoemaker purportedly discloses a card that includes both swiping and the ability to transmit data without swiping. Comm’n Op. at 36-37; Samsung Sub. at 32-33. Specifically, claim 21 recites (in relevant part) a card:

dynamically reconfigurable data providing means attached to said card base, said dynamically reconfigurable data providing means being configured to provide said card reader a first data pattern for a first transaction that is different from a second data pattern for a second data transaction, said second data pattern also provided to said card reader by said dynamically reconfigurable data providing means, *wherein at least one of said first data pattern and said second data pattern represents a time-varying serial data stream, wherein each data value in said time-varying serial data stream is a function of time*; and

a swipe direction detector coupled with said dynamic reconfigurable data providing means, wherein each of said first data pattern and said second data pattern changes responsive to a swipe direction of said active card with respect to said card reader, said swipe direction ascertained via said swipe direction detector.

Shoemaker at 17:32-57 (claim 21) (emphasis by Samsung). Shoemaker explains that the “time-varying serial data stream” is meant to address the problem in the prior art wherein “variations in the swiping speed have often-time caused the magnetic stripe reader to fail to read the data pattern on the prior art credit card.” Shoemaker at 8:33-36. To address this issue, Shoemaker teaches configuring the data “such that data can be reliably provided to the magnetic reader head irrespective of the speed at which the card is swiped through the magnetic stripe card reader.” *Id.* at 8:38-41.

Samsung argues “given Shoemaker’s implementation of this [forward/reverse] functionality in a device that does not require swiping, a POSITA would have been motivated to combine Shoemaker and Gutman, even though Gutman’s card does not need to be swiped through

PUBLIC VERSION

a card reader either.” Samsung Sub. at 33. The implication is that because Shoemaker includes transmission that does not rely on swiping and forward/reverse data, there must be some reason the person of ordinary skill would have added forward/reverse data to Gutman as well. This supposition does not amount to clear and convincing evidence of motivation to combine. Likewise the Commission Opinion asserts that Shoemaker’s disclosure “demonstrat[es] that Gutman’s statement that ‘no swiping movement is necessary’ would not deter one of ordinary skill to combine the references.” Comm’n Op. at 36. “Would not deter” is insufficient basis for a motivation to combine. As Dynamics noted, there is no support in the record for the notion that in 2011 the person of ordinary skill “would seek out Gutman’s invention that was already almost a decade old, so that he or she go back and modify that old technology to add features that were already present in Shoemaker.” Dynamics Reply at 25.

At most, Shoemaker supports the notion that the forward/reverse functionality *could be* combined with the Gutman card, not that the person of ordinary skill would be motivated to do so. Gutman and Shoemaker, though both art in the same field, have fundamentally different purposes. Gutman provides alternative hardware to traditional magnetic stripe cards making swiping irrelevant, while Shoemaker offers a different approach to generating data communicated by the cards when swiped. Neither Samsung nor the Commission Opinion cited evidence to reconcile the disparate purposes of these inventions such that the person of ordinary skill would have sought to combine them in the manner claimed by the ’153 patent. *See Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1359–60 (Fed. Cir. 2020). Accordingly, I would affirm the ID’s finding that Samsung failed to show by clear and convincing evidence that the ’153 patent is invalid.

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **ORDER, COMMISSION** has been served upon the following parties as indicated, on **July 27, 2021**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
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Washington, DC 20436

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UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of

**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

Investigation No. 337-TA-1170

**NOTICE OF A COMMISSION DETERMINATION TO REVIEW IN PART A
FINAL INITIAL DETERMINATION FINDING NO VIOLATION OF SECTION 337;
REQUEST FOR WRITTEN SUBMISSIONS ON THE ISSUES UNDER REVIEW AND
ON REMEDY, THE PUBLIC INTEREST, AND BONDING**

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that the U.S. International Trade Commission has determined to review in part the Administrative Law Judge's ("ALJ") final initial determination ("ID") issued on March 16, 2021, finding no violation of section 337 in the above-referenced investigation. The Commission requests briefing from the parties on certain issues under review, as indicated in this notice, and submissions from the parties, interested government agencies, and interested persons on the issues of remedy, the public interest, and bonding, under the schedule set forth below.

FOR FURTHER INFORMATION CONTACT: Panyin A. Hughes, Office of the General Counsel, U.S. International Trade Commission, 500 E Street SW, Washington, D.C. 20436, telephone (202) 205-3042. Copies of non-confidential documents filed in connection with this investigation may be viewed on the Commission's electronic docket (EDIS) at <https://edis.usitc.gov>. For help accessing EDIS, please email EDIS3Help@usitc.gov. General information concerning the Commission may also be obtained by accessing its Internet server at <https://www.usitc.gov>. Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on (202) 205-1810.

SUPPLEMENTARY INFORMATION: On August 16, the Commission instituted this investigation based on a complaint filed by Dynamics Inc. ("Dynamics") of Cheswick, Pennsylvania. 84 FR 42009-10 (Aug. 16, 2019). The complaint, as supplemented, alleges violations of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337, in the importation into the United States, the sale for importation, or the sale within the United States

after importation of certain mobile devices with multifunction emulators by reason of infringement of one or more of claims 1 and 5-8 of U.S. Patent No. 8,827,153 (“the ’153 patent”); claims 1-20 of U.S. Patent No. 10,032,100 (“the ’100 patent”); claims 1-7, 9-13, 19, 21, and 22 of U.S. Patent No. 10,223,631 (“the ’631 patent”); and claims 1-16 of U.S. Patent No. 10,255,545 (“the ’545 patent”). *Id.* at 42010. The Commission’s notice of investigation named as respondents Samsung Electronics Co., Ltd of Gyeonggi, Republic of Korea and Samsung Electronics America, Inc. of Ridgefield Park, New Jersey (collectively, “Samsung”). *Id.* The Office of Unfair Import Investigations is not participating in this investigation.

On September 3, 2019, the ALJ set a sixteen-month target date of December 16, 2020 for completion of the investigation. Order No. 3 (Sept. 3, 2019). The Order set an evidentiary hearing for May 11-15, 2020.

On November 26, 2019, the ALJ held a *Markman* hearing, and on January 31, 2020, issued Order No. 7, construing certain claim terms of the asserted patents.

On May 20, 2020, the ALJ issued an initial determination granting Dynamics’ unopposed motion for partial termination of the investigation as to claims 5, 6, and 8 of the ’153 patent, claims 2, 3, 5, 7, 9-11, 13-17, 19, and 20 of the ’100 patent, claims 2, 3, 5, 7, 9-13, 19, and 21 of the ’631 patent, and claims 2, 4, and 6-16 of the ’545 patent. Order No. 15 (May 20, 2020), *unreviewed*, Notice (June 15, 2020).

Due to the ongoing COVID-19 pandemic, the ALJ amended the procedural schedule several times. On March 12, 2020, the Commission postponed all in-person hearings under section 337 scheduled within the next sixty days. *See* 85 FR 15498 (Mar. 18, 2020). Thus, the ALJ issued Order No. 10, rescheduling the evidentiary hearing for June 22-26, 2020.

On April 6, 2020, the ALJ issued Order No. 12, resetting the target date to February 23, 2021 due to the COVID-19 pandemic. Order No. 12 (Apr. 6, 2020), *unreviewed*, Notice (Apr. 24, 2020).

On May 14, 2020, the Commission extended the postponement of all section 337 hearings. *See* 85 FR 30734-5 (May 20, 2020). On June 22, 2020 the Commission further extended the postponement of all in-person section 337 hearings “until such time as the agency enters Phase Three of the Commission’s three-phase plan to re-establish on-site business operations.” 85 FR 38388-9 (June 26, 2020). This order is currently in effect.

On August 11, 2020, the ALJ scheduled a virtual hearing using the Commission’s newly established videoconference software for November 16-20, 2020 and reset the target date for July 16, 2021. Order No. 24 (Aug. 11, 2020), *unreviewed*, Notice (Sept. 8, 2020).

On March 16, 2021, the ALJ issued the final ID, finding no violation of section 337. The ID found that the importation requirement under 19 U.S.C. 1337(a)(1)(B) is satisfied. ID at 28. Specifically, the ID found that “[t]he parties stipulated to facts establishing the importation

requirement is met for both respondents” and that “Samsung does not dispute the Commission’s jurisdiction over this investigation or that the requisite importation or sale in connection with importation has taken place for each Accused Product.” *Id.* Accordingly, the ID found that the Commission has jurisdiction over this investigation and that the importation requirement has been satisfied. *Id.*

With respect to the domestic industry requirement, the ID found that Dynamics had satisfied the domestic industry requirement for the ’100 patent, but not the ’153, ’631, and ’545 patents. ID at 183-84. For the domestic industry requirement’s technical prong, the ID found that Dynamics failed to show it practiced any claim of the ’153 and ’631 patents. *Id.* at 60-64, 127-31. For the ’545 patent, however, the ID found that Dynamics had shown it was “in the process” of practicing claim 1 of the ’545 patent. *Id.* at 148-52. With respect to the domestic industry requirement’s economic prong, for the ’153 and ’631 patents, the ID found that Dynamics had shown it had made significant investments in satisfaction of section 337(a)(3)(A) and (B), 19 U.S.C. 1337(a)(3)(A)-(B). *Id.* at 158-79. For the ’545 patent, the ID found that Dynamics had not shown that it was “in the process” of establishing a U.S. industry. *Id.* at 180-83.

With respect to infringement and validity, the ID found that Samsung infringes claims 1 and 7 of the ’153 patent and that Samsung failed to establish that those claims are invalid. ID at 45-58, 64-69. The ID also found that Samsung infringes claims 1, 4, 6, 12, and 18 of the ’100 patent (except for claim 6 as to certain modified products), but that the asserted claims, except for claim 4 are invalid as anticipated or obvious by prior art. *Id.* at 83-88, 96-115. The ID further found that Samsung directly infringes claims 1, 4, 6, and 22 of the ’631 patent, but that those claims are invalid as anticipated or obvious by prior art. *Id.* at 121-127, 131-140. The ID also found that Samsung directly infringes claims 1, 3, and 5 of the ’545 patent, but that those claims are invalid for anticipation. Finally, the ID found that Samsung failed to carry its burden with respect to various additional affirmative defenses under 35 U.S.C. 102(f), 116 (inventorship), or 112 (written description and enablement).

The ID included the ALJ’s recommended determination on remedy and bonding (“RD”). The RD recommended that the Commission should issue a limited exclusion order and cease and desist orders if it finds a violation. ID/RD at 186-91. The ID, however, recommended imposing no bond on covered products that may be imported during the period of Presidential review. *Id.* at 193.

On March 29, 2021, Dynamics filed a petition for review of the ID, and Samsung filed a contingent petition for review. On April 8, 2021, Dynamics and Samsung submitted responses to each other’s petition.

Having examined the record of this investigation, including the ID, the petitions for review, and the responses thereto, the Commission has determined to review the ID with respect to the following: (1) for the ’153 patent, claim construction of the term “analog waveform” as well as the related infringement and technical prong analysis, (2) for the ’153 patent, the ID’s

finding that the combination of Shoemaker and Gutman fails to render the asserted claims obvious; (3) for the '100 patent, whether Doughty in combination with VivoTech renders obvious claim 4 and whether such issue was waived, whether claims 4 and 6 are infringed, and whether the domestic industry requirement is satisfied; and (4) for the '545 patent, the ID's domestic industry findings. The Commission has determined not to review the remainder of the ID.

The parties are requested to brief their positions on only the following issues:

1. If the Commission construes "analog waveform" to mean "a wave shape whose amplitude changes in a continuous fashion" that includes so-called real-world square waves, please cite record evidence and explain whether the accused products and DI products meet the relevant claim limitations.
2. Given Gutman's disclosure that "communication of data by the card of the current invention is independent of movement of the card or placement of the card within the magnetic card reader" (Gutman at col.17 ll.10-13), please explain why or why not one of ordinary skill would be motivated to combine Shoemaker with Gutman.
3. While Gutman states that "no 'swiping' movement is necessary," the disclosure "allows users to perform the familiar 'swiping' movement while using the card 200 of the present invention for users that have become accustomed to the 'swiping' movement of the card 106." Gutman at col.16 l.66 - col.17 l.4. Please discuss the legal significance of this disclosure to an obviousness inquiry in light of Samsung's proposal to combine Gutman with Shoemaker to solve the so-called directionality problem associated with "swiping."

The parties are requested to brief their positions with reference to the applicable law and the existing evidentiary record. The parties are not to brief other issues on review, which are adequately presented in the parties' existing filings.

In connection with the final disposition of this investigation, the Commission may issue: (1) an exclusion order that could result in the exclusion of the subject articles from entry into the United States, and/or (2) a cease-and-desist order that could result in the respondent being required to cease and desist from engaging in unfair acts in the importation and sale of such articles. Accordingly, the Commission is interested in receiving written submissions that address the form of remedy, if any, that should be ordered. If a party seeks exclusion of an article from entry into the United States for purposes other than entry for consumption, the party should so indicate and provide information establishing that activities involving other types of entry either are adversely affecting it or likely to do so. For background, *see Certain Devices for Connecting Computers via Telephone Lines*, Inv. No. 337-TA-360, USITC Pub. No. 2843, Comm'n Op. at 7-10 (Dec. 1994).

If the Commission contemplates some form of remedy, it must consider the effects of that remedy upon the public interest. The factors the Commission will consider include the effect that an exclusion order and/or cease and desist orders would have on (1) the public health and welfare, (2) competitive conditions in the U.S. economy, (3) U.S. production of articles that are like or directly competitive with those that are subject to investigation, and (4) U.S. consumers. The Commission is therefore interested in receiving written submissions that address the aforementioned public interest factors in the context of this investigation.

If the Commission orders some form of remedy, the U.S. Trade Representative, as delegated by the President, has 60 days to approve, disapprove, or take no action on the Commission's determination. *See* Presidential Memorandum of July 21, 2005, 70 FR 43251 (July 26, 2005). During this period, the subject articles would be entitled to enter the United States under bond, in an amount determined by the Commission and prescribed by the Secretary of the Treasury. The Commission is therefore interested in receiving submissions concerning the amount of the bond that should be imposed if a remedy is ordered.

WRITTEN SUBMISSIONS: The parties to this investigation are requested to file written submissions on the issues identified in this Notice and on the issues of remedy, the public interest, and bonding. Complainant is requested to submit proposed remedial orders for the Commission's consideration. Complainant is also requested to state the date that the patents expire and the HTSUS subheadings under which the accused products are imported. Complainant is further requested to supply the names of known importers of Respondents' products at issue in this investigation.

The parties' written submissions and proposed remedial orders must be filed no later than the close of business on Wednesday, June 2. Reply submissions must be filed no later than the close of business on Wednesday, June 9. Opening submissions are limited to 50 pages. Reply submissions are limited to 30 pages. Such submissions should address the ALJ's recommended determination on remedy and bonding. Interested government agencies and any other interested parties are also encouraged to file written submissions on the issues of remedy, the public interest, and bonding. Third-party submissions should be filed no later than the close of business on Wednesday, June 9. No further submissions on any of these issues will be permitted unless otherwise ordered by the Commission.

Persons filing written submissions must file the original document electronically on or before the deadlines stated above. The Commission's paper filing requirements in 19 C.F.R. 210.4(f) are currently waived. 85 FR 15798 (March 19, 2020). Submissions should refer to the investigation number ("Inv. No. 337-TA-1170") in a prominent place on the cover page and/or the first page. (*See Handbook on Filing Procedures, https://www.usitc.gov/documents/handbook_on_filing_procedures.pdf*). Persons with questions regarding filing should contact the Secretary at (202) 205-2000.

Any person desiring to submit a document to the Commission in confidence must request confidential treatment unless the information has already been granted such treatment during the

proceedings. All such requests should be directed to the Secretary of the Commission and must include a full statement of the reasons why the Commission should grant such treatment. *See* 19 CFR 210.6. Documents for which confidential treatment by the Commission is sought will be treated accordingly. A redacted non-confidential version of the document must also be filed simultaneously with any confidential filing. All information, including confidential business information and documents for which confidential treatment is properly sought, submitted to the Commission for purposes of this Investigation may be disclosed to and used: (i) by the Commission, its employees and Offices, and contract personnel (a) for developing or maintaining the records of this or a related proceeding, or (b) in internal investigations, audits, reviews, and evaluations relating to the programs, personnel, and operations of the Commission including under 5 U.S.C. Appendix 3; or (ii) by U.S. government employees and contract personnel¹, solely for cybersecurity purposes. All non-confidential written submissions will be available for public inspection at the Office of the Secretary and on EDIS.

The Commission's vote on this determination took place on May 17, 2021.

The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), and in part 210 of the Commission's Rules of Practice and Procedure (19 CFR 210).

By order of the Commission.

A handwritten signature in black ink, appearing to read 'Lisa R. Barton', enclosed within a large, loopy oval shape.

Lisa R. Barton
Secretary to the Commission

Issued: May 17, 2021

¹ All contract personnel will sign appropriate nondisclosure agreements.

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **NOTICE** has been served upon the following parties as indicated, on **May 17, 2021**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

Inv. No. 337-TA-1170

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON REMEDY AND BOND**

Administrative Law Judge Cameron Elliot

(March 16, 2021)

Pursuant to the Notice of Investigation and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is my Initial Determination in the matter of *Certain Mobile Devices with Multifunction Emulators*, Investigation No. 337-TA-1170.

TABLE OF CONTENTS

Page

I.	INTRODUCTION.....	1
A.	Procedural Background.....	1
B.	The Parties	3
C.	The Asserted Patents and Claims.....	4
D.	Products at Issue	7
1.	Domestic Industry Products.....	7
2.	Accused Products.....	7
3.	Non-Accused Products.....	8
II.	STANDARDS OF LAW	16
A.	Standing	16
B.	Claim Construction	16
C.	Infringement.....	20
D.	Domestic Industry	20
1.	Technical Prong	21
2.	Economic Prong.....	22
E.	Invalidity	23
1.	35 U.S.C. § 102.....	23
2.	35 U.S.C. § 103.....	24
3.	35 U.S.C. § 112.....	26
III.	IMPORTATION AND JURISDICTION	28
IV.	U.S. PATENT NO. 8,827,153	28
A.	Level of Ordinary Skill in the Art.....	28
B.	Claims-at-Issue	28
C.	Claim Construction	29
1.	“at least one track of magnetic stripe data”	29
2.	“a device”	33
3.	“analog waveform”	33
4.	“operable to”	41
D.	Infringement.....	45
1.	Claim 1	49
2.	Claim 7.....	56

E.	Domestic Industry – Technical Prong.....	58
1.	Claim 1.....	60
2.	Claim 7.....	63
F.	Validity	64
V.	U.S. PATENT NO. 10,032,100	69
A.	Level of Ordinary Skill in the Art.....	69
B.	Claims-at-Issue	69
C.	Claim Construction	70
1.	“operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader”	70
2.	“a device” and “a portable telephonic device”	78
3.	“operable to”	82
D.	Infringement.....	83
1.	Undisputed Claims.....	84
2.	Disputed Claims.....	85
a.	Claim 1	85
b.	Claim 12.....	87
c.	Claim 18.....	87
E.	Domestic Industry – Technical Prong.....	88
1.	Claim 1	89
2.	Claim 6.....	93
3.	Claim 8.....	95
F.	Validity	96
1.	VivoTech.....	97
2.	Doughty.....	100
3.	VivoTech in combination	104
4.	Doughty in combination	109
5.	35 U.S.C. § 112, ¶ 2 (Enablement)	115
6.	35 U.S.C. §§ 102(f), 116 (Improper Inventorship)	116
VI.	U.S. PATENT NO. 10,223,631	118
A.	Level of Ordinary Skill in the Art.....	118
B.	Claims-at-Issue	118
C.	Claim Construction	119

1.	“electrically couple”	120
2.	“an apparatus”	120
3.	“operable to”	121
D.	Infringement.....	121
1.	Undisputed Claims.....	122
2.	Disputed Claims.....	122
a.	Claim 1	123
b.	Claim 22.....	126
E.	Domestic Industry – Technical Prong.....	127
1.	Claim 1	127
2.	Claim 6.....	130
3.	Claim 22.....	131
F.	Validity	131
1.	VivoTech.....	132
2.	Doughty.....	134
3.	VivoTech in combination	135
4.	Doughty in combination	137
5.	35 U.S.C. § 112, ¶ 1 (Written Description)	140
6.	35 U.S.C. §§ 102(f), 116 (Improper Inventorship)	141
VII.	U.S. PATENT NO. 10,255,545	142
A.	Level of Ordinary Skill in the Art.....	142
B.	Claims-at-Issue	142
C.	Claim Construction	143
1.	“a device”	143
2.	“electrically couple”	144
3.	“operable to”	144
D.	Infringement.....	144
1.	Undisputed Claims.....	145
2.	Disputed Claim	146
E.	Domestic Industry – Technical Prong.....	148
F.	Validity and Other Defenses	152
1.	Pitroda	153
2.	35 U.S.C. §§ 102(f), 116 (Improper Inventorship)	156

VIII. DOMESTIC INDUSTRY - ECONOMIC PRONG	156
A. Domestic Industry in Existence	158
1. Qualifying Expenditures	158
a. Subsection (A) – Plant and Equipment	159
b. Subsection (B) – Labor and Capital	169
2. “Significant” or “Substantial”	171
a. Subsection (A) – Plant and Equipment	172
b. Subsection (B) – Labor and Capital	176
B. Domestic Industry in the Process of Being Established	180
IX. CONCLUSIONS OF LAW	183
X. RECOMMENDED DETERMINATION ON REMEDY AND BOND	184
A. Limited Exclusion Order	186
B. Cease and Desist Order	190
C. Bond	191
XI. INITIAL DETERMINATION AND ORDER	194

TABLE OF ABBREVIATIONS

CDX	Complainant's Demonstrative Exhibit
CIB	Complainant's Revised Initial Post-Hearing Brief
CPB	Complainant's Pre-Hearing Brief
CPX	Complainant's Physical Exhibit
CRB	Complainant's Reply Post-Hearing Brief
CX	Complainant's Exhibit
Dep. Tr.	Deposition Transcript
Hr'g Tr.	Hearing Transcript
JX	Joint Exhibit
RDX	Respondents' Demonstrative Exhibit
RIB	Respondents' Initial Post-Hearing Brief
RPB	Respondents' Pre-Hearing Brief
RPX	Respondents' Physical Exhibit
RRB	Respondents' Reply Post-Hearing Brief
RX	Respondents' Exhibit

I. INTRODUCTION

A. Procedural Background

Complainant Dynamics Inc. (“Dynamics” or “Complainant”) filed the complaint underlying this investigation on July 12, 2019. The complaint alleged respondents Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (“Samsung” or “Respondents”) import or sell in connection with an importation certain mobile devices with multifunction emulators that infringe one or more claims of U.S. Patent Nos. 8,827,153 (“the 153 patent”), 10,032,100 (“the 100 patent”), 10,223,631 (“the 631 patent”), and 10,255,545 (“the 545 patent”).

By publication of a notice in the *Federal Register* on August 16, 2019, the U.S. International Trade Commission ordered that:

Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of products identified in paragraph (2) by reason of infringement of one or more of claims 1 and 5-8 of the ’153 patent; claims 1-20 of the ’100 patent; claims 1-7, 98-13, 19, 21, and 22 of the ’631 patent; and claims 1-16 of the ’545 patent, and whether an industry in the United States exists or is in the process of being established as required by subsection (a)(2) of section 337[.]

84 Fed. Reg. 42010 (Aug. 16, 2019). On September 3, 2019, I set a target date of December 16, 2020 for completion of this investigation via initial determination. Order No. 3. Also on September 3, 2019, I set a *Markman* hearing date of November 25-26, 2019 and an evidentiary hearing of May 11-15, 2020. Order No. 4. On September 11, 2019, the *Markman* hearing was moved back one day to November 26-27, 2019. Order No. 5.

On November 26, 2019, I held a technology tutorial and *Markman* hearing, and on January 31, 2020, issued Order No. 7, construing certain claim terms of the patents at issue. On March 10, 2020, Dynamics moved for summary determination of economic prong only as to the 153, 631, and 100 patents (Motion No. 1170-003), which was denied on June 9, 2020 with Order No. 18.

[REDACTED]

On March 11, 2020, Samsung moved for summary determination on a number of issues (Motion No. 1170-004) including non-infringement as to certain products, lack of technical prong domestic industry under the 545 patent, and invalidity and unenforceability of the 100, 631, and 545 patents. This motion was denied on June 9, 2020. Order No. 19.

On May 19, 2020, Dynamics moved to terminate the investigation (Motion No. 1170-010) with respect to: claims 5, 6, and 8 of the 153 patent; claims 2, 3, 5, 7, 9-11, 13-17, 19, and 20 of the 100 patent; claims 2, 3, 5, 7, 9-13, 19, and 21 of the 631 patent; and claims 2, 4, 6-16 of the 545 patent. The motion was granted via initial determination on May 20, 2020 with Order No. 15. The Commission determined not to review Order No. 15 on June 15, 2020. EDIS Doc. No. 712655.

A number of modifications to this investigation's procedural schedule took place in light of the ongoing COVID-19 pandemic. On March 12, 2020, the Commission gave notice that all in-person hearings under section 337 scheduled within the next sixty days were to be postponed. *See* 85 Fed. Reg. 15498 (March 18, 2020). On March 13, 2020, the parties filed a joint motion (Motion No. 1170-005) to suspend the procedural schedule, as the evidentiary hearing would have occurred within that sixty-day period. On March 16, 2020, the motion to stay was granted with Order No. 9.

On March 26, 2020, the evidentiary hearing was rescheduled for June 22-26, 2020, assuming the Commission would be open by that date. Order No. 10. On April 6, 2020, a corresponding target date was set via initial determination for February 23, 2021. Order No. 12. On April 24, 2020, the Commission determined not to review Order No. 12. EDIS Doc. ID 708803.

[REDACTED]

On May 14, 2020, the Commission issued a notice extending the postponement of all section 337 hearings. *See* 85 Fed. Reg. 30734-5 (May 20, 2020). Accordingly, on May 15, 2020, I suspended the evidentiary hearing once again and until further notice, with all pre-hearing deadlines as scheduled by Order No. 12 remaining in place. Order No. 14.

On June 22, 2020 the Commission further extended the postponement of all in-person section 337 hearings “until such time as the agency enters Phase Three of the Commission’s three-phase plan to re-establish on-site business operations.” 85 Fed. Reg. 38388-9 (June 26, 2020). This order is currently in effect. Accordingly, on June 29, 2020, I issued Order No. 21, which put in place a modified hearing procedure based on submissions from the parties, but left the dates for the evidentiary hearing open. On July 23, 2020, I issued Order No. 22, which adopted additional procedures and deadlines requested by the parties.

Thereafter, on August 11, 2020, I scheduled a virtual hearing using the Commission’s newly established videoconference software for November 16-20, 2020, and reset the target date for July 16, 2021. Order No. 24. On November 4, 2020, and pursuant to Order Nos. 27 and 28, a one-day hearing was held to address certain evidentiary objections from the parties. The evidentiary hearing then took place as scheduled on November 16-20, 2020.

Pursuant to the procedural schedule, and Order Nos. 30, 31, and 32, the parties submitted initial and reply post-hearing briefs on December 9, 2020 and December 22, 2020, respectively. As of the date of this initial determination, no motions remain pending.

B. The Parties

Complainant Dynamics Inc. is a United States corporation organized and existing under the laws of Pennsylvania and having its principal place of business in Cheswick, Pennsylvania. CIB at 2. Dynamics researches, designs, and produces payment card systems intended to improve

[REDACTED]

reliability, security, and efficiency over traditional magnetic stripe payment cards. *Id.* (citing CX-1197C at Q/A 1, 2, 5; CX-1198C at Q/A 17).

Respondent Samsung Electronics Co., Ltd. is a corporation organized and existing under the laws of South Korea with its principal place of business at Gyeonggi-do 16677, South Korea. RIB at 5. Samsung Electronics Co., Ltd. manufactures a “wide range of consumer and industry products, including semiconductors, personal computers, peripherals, monitors, televisions, home appliances, network systems, and telecommunications equipment including mobile devices.” *Id.* (citing, *inter alia*, RX-0669). Respondent Samsung Electronics America, Inc. is a corporation organized and existing under the laws of New York and having a principal place of business in Ridgefield Park, New Jersey. *Id.* Samsung Electronics America, Inc. is a subsidiary of Samsung Electronics Co., Ltd. *Id.* (citing RX-0673).

C. The Asserted Patents and Claims

The Asserted Patents all relate to devices used for making payments with point-of-sale systems in lieu of traditional magnetic stripe-bearing payment cards (*e.g.*, debit or credit cards). In order to accomplish the transaction, the devices create magnetic waveforms that are then received by the same magnetic stripe reader which would have interacted with the traditional payment card. *See, e.g.*, 153 patent at 1:23-37. In this way, it is an objective of the inventions that the magnetic waveform created by the devices be readable or understandable by the magnetic stripe reader in the same way that the magnetic stripe data of the traditional card would have been. Due to this functionality, the inventions include what is referred to as a magnetic stripe emulator. *See, e.g.*, 153 patent at 1:22-37. The following patent claims are at issue in this investigation:

Asserted Patent	Infringement Claims	Domestic Industry Claims
8,827,153	1, 7	1, 7



10,032,100	1, 4, 6, 12, 18	1, 6, 8
10,223,631	1, 4, 6, 22	1, 6, 22
10,255,545	1, 3, 5	1, 5

See CIB at 28, 34-36, 47, 52, 76, 80, 91, 94.

The 153 patent is entitled, “Systems and Methods for Waveform Generation for Dynamic Magnetic Stripe Communication Devices.” CX-0667; RX-0048 (cited herein as “153 patent”). The application leading to the 153 patent was filed on July 17, 2012 and claims priority to a provisional application, 61/509,033, filed on July 18, 2011. *Id.* The 153 patent issued on September 9, 2014. *Id.*

The 100 patent is entitled, “Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same.” CX-0669; RX-0047 (cited herein as “100 patent”). The application leading to the 100 patent was filed on April 25, 2016 and claims priority, through two intervening continuation applications, to several provisional applications—the earliest of which, 61/016,491, was filed on December 24, 2007. *Id.* The 100 patent issued on July 24, 2018. *Id.*

The 631 patent is entitled, “Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same.” CX-0671; RX-0049 (cited herein as “631 patent”). The application leading to the 631 patent was filed on August 1, 2016 and claims priority, through two intervening continuation applications, to several provisional applications—the earliest of which, 61/016,491, was filed on December 24, 2007. *Id.* The 631 patent issued on March 5, 2019. *Id.*

The 545 patent is entitled, “Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same.” CX-0673; RX-0050 (cited herein as “545 patent”). The application leading to the 545 patent was filed on August 1, 2016 and claims priority, through two intervening

continuation applications, to several provisional applications—the earliest of which, 61/016,491, was filed on December 24, 2007. *Id.* The 545 patent issued on April 9, 2019. *Id.*

By way of background, the purpose of the magnetic stripe on the back of traditional payment cards is to carry and communicate data to a magnetic card reader. *See* CIB at 6; RIB at 6. The stripe and its data are subject to various standards set by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). *See* CIB at 6, 8-9; RIB at 6. One such standard requires that the data be encoded in the magnetic stripe on the payment card in a format known as frequency/double frequency (F2F) encoding. CIB at 6-7. Another part of the standard requires that the data be organized into “tracks” and, more specifically, between one to three tracks, referred to as Track 1, Track 2, and Track 3. RIB at 6. As described in Order No. 7, the tracks are stacked across the full width of the payment card as shown below, and are comprised of different character-types at different densities:

Magnetic Stripe Encoding - Financial Transaction Cards

↑ 0.223" ↓	Track		Recording Density (bits per inch)	Character Configuration (including parity bit)	Information Content (including control characters)
0.110"	1	IATA	210	7 bits per character	79 alphanumeric characters
0.110"	2	ABA	75	5 bits per character	40 numeric characters
0.110"	3	THRIFT	210	5 bits per character	107 numeric characters

Order No. 7 at 9; *see* CX-0155C at *7. The arrangement of the data within each track is also standardized, with known starting and stopping characters, or “sentinels,” and field separators. *Id.* In traditional point-of-sale systems, the data contained in each track (*i.e.*, contained in the magnetic stripe) is read by swiping or sliding the stripe against a fixed magnetic read head in a magnetic

[REDACTED]

card reader. In this way, the read head reads each bit of data as it moves by. *See* CIB at 6-7; RIB at 6.

In order to communicate this same information to the same type of read head, the inventions of the asserted patents create magnetic fields similar to those created by the magnetic stripe of the traditional payment card. *See* 153 patent at 1:22-37; CIB at 7-8; RIB at 6-7. The 153 patent, for example, describes creating such fields by passing electrical current through an inductor (*e.g.*, a coil). 153 patent at 2:14-22. Aspects of the produced field, such as its magnitude or direction, may be varied by altering the strength or direction of the current passing through the coil. *Id.* at 2:14-22, 2:66-3:11.

D. Products at Issue

1. Domestic Industry Products

The domestic industry products in this investigation are payment cards which include a microprocessor, coil, battery, and other electrical components, and are dimensioned so as to meet the form factor of traditional payment cards with magnetic stripes. With this size in mind, Dynamics asserts, the products are “intended for use in the traditional manner – *i.e.*, to be swiped through a trough in the magnetic stripe reader” in a point-of-sale device. CIB at 13 (citing CX-1198C at Q/A 30-47; CX-1204C at Q/A 66-67; Hr’g Tr. at 40:23-41:3, 83:17-85:4). The specific models include the IndusInd device, the CIBC device, the SMCC device, and the Emirates NBD device (also referred to as the Connected Wallet Card) (collectively, the “DI Products”). *See id.* (citing CX-1199C at Q/A 66; Hr’g Tr. at 33:15-25).

2. Accused Products

The accused products in this investigation are mobile devices from Samsung—in particular, smartphones and smart watches—which include a feature called MST. According to Samsung, MST is “a proprietary magnetic emulation technology that permits a user to conduct a

credit card transaction at a short distance from a magnetic stripe reader.” RIB at 1. The products also include software in the form of a payment application known as Samsung Pay, which controls MST, to complete transactions. *See id.* at 10-11. The specific devices which Dynamics has accused of infringement (hereafter, the “Accused Products”), and their representative model, are as follows:

Accused Product	Representative Product
Samsung Galaxy S10; Galaxy S8; Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy S10e; Galaxy S10+; Galaxy S10 5G; Note 7; Note 8; Note 9; Galaxy S20; Galaxy Fold; Note 10	Samsung Galaxy S10
Samsung Galaxy A50; Galaxy A51	Samsung Galaxy A50
Samsung Gear S3; Gear S3 Frontier	Samsung Gear S3

CIB at 14 (citing CX-1199C at Q/A 72-76).

3. Non-Accused Products

This investigation also involves a set of Samsung products which bear the same model numbers as some of the Accused Products but have been modified, either from a software or hardware perspective, to remove MST functionality (“Software-Modified Products” or “Hardware-Modified Products,” respectively). *See* RIB at 4, 12; CIB at 102-106. These products include:

Hardware-Modified Products	Software-Modified Products
Galaxy S10	Galaxy S10

Galaxy A50	Galaxy A50
--	Galaxy A70

RIB at 12; RX-1670C at Q/A 25; RX-1672C at Q/A 15. While not accused of infringement by Dynamics, Samsung argues infringement under the asserted claims of the asserted patents by these products should nonetheless be determined—a position which Dynamics opposes. *See generally* RIB at 4, 14-15, 35-43; CIB at 102-109.

The Commission has established:

[T]hat the test for determining whether a respondent has met its burden for adjudication of a redesigned or alternative product includes four factors: (1) whether the product is within the scope of the investigation; (2) whether it has been imported; (3) whether it is sufficiently fixed in design; and (4) whether it has been sufficiently disclosed by respondent during discovery. *See Two-Way Radio*, 2018 WL 8648379 at *13-14.

Certain Human Milk Oligosaccharides and Methods of Producing the Same, Inv. No. 337-TA-1120, Comm’n Op. at 18 (June 8, 2020) (“*Oligosaccharides*”). The Commission also clarified that it has a standing “policy in favor of adjudicating redesigns to prevent subsequent and potentially burdensome proceedings that could have been resolved in the first instance in the original Commission investigation” (*id.*) and, despite factor (2) in the excerpt above, redesigns do not actually need to be imported at all (*id.* at 18 n. 21; *but see Certain Dental and Orthodontic Scanners and Software*, Inv. No. 337-TA-1144, Comm’n Op. at 8 (Dec. 3, 2020) (confirming “affirmative” evidence of importation is necessary for an accused product)). As an example of the flexibility on this issue, the Commission held in *Oligosaccharides* that two documents produced without explanation from the producing party during fact discovery (and one, a patent application containing no reference to the redesigned product name) qualified as “sufficient” discovery under factor (4). *See id.* at 14-15, 20-23. The Commission also held, in a determination that adjudication

[REDACTED]

of a redesign was warranted, that evidence of actual importation outweighed a request for admission (“RFA”) response that importation had not occurred. *See id.* at 15, 20.

With this policy and guidance in mind, it is difficult to see why the Commission would not evaluate the Software-Modified Products and Hardware-Modified Products in this investigation. *See Certain Television Sets, Certain Television Receivers, Television Tuners, and Components Thereof*, Inv. No. 337-TA-910, Order No. 46 at 29 (Nov. 28, 2014) (not reviewed). Two of the four factors are not in dispute: (1) they are within the scope of the investigation, and (2) there has been importation. CIB at 102-107; CRB at 12-19; RIB at 38-39 (citing, *inter alia*, RX-1472C; RX-1619C; RX-1620C; RX-1473C; RX-1621C).

As to factor (3), “fixed in design,” Samsung argues “[t]hese Modified Products are as ‘fixed in design’ as any redesign approved by the Commission because the design is set—the products are the same as the other Accused Products except for the relatively minor and straightforward modification needed to render them incapable of conducting a payment transaction using MST.” RIB at 39 (citing RX-1670C at Q/A 26, 37, 53; RX-1672C at Q/A 17, 29, 51, 69); *see id.* at 36-37 (discussing hardware and software changes). Samsung adds, “[t]he evidence shows that the Modified Products could be sold if Samsung chose to do so, as evidenced by the sample products and the fact that Samsung has already sold devices without MST in the United States [REDACTED]

[REDACTED] and by its sale of phones without MST in other countries.” *Id.* (citing Hr’g Tr. at 663:5-14, 454:21-455:12; RX-1676C at Q/A 27); RRB at 66 (“[REDACTED]

[REDACTED]”). In contrast to some of Dynamics’ claims, Samsung clarifies that its “engineers either created or provided the information for the PowerPoint presentations that

[REDACTED]

depict all differences between the Modified Products and currently-sold versions.” RRB at 67 (CX-1209C at 118:6-9, 123:9-18; Hr’g Tr. at 419:22-420:6, 426:10-18).

Dynamics opposes. As to the Hardware-Modified Products, Dynamics asserts that the documentation produced amounted to merely PowerPoint slides, comprised of vague schematics not prepared by Samsung engineers and not “tie[d] . . . to any other Accused Products at issue.” CIB at 104 (citing, *inter alia*, RX-0085C; RX-0086C; Hr’g Tr. at 420:7-10, 426:13-18). Dynamics adds:

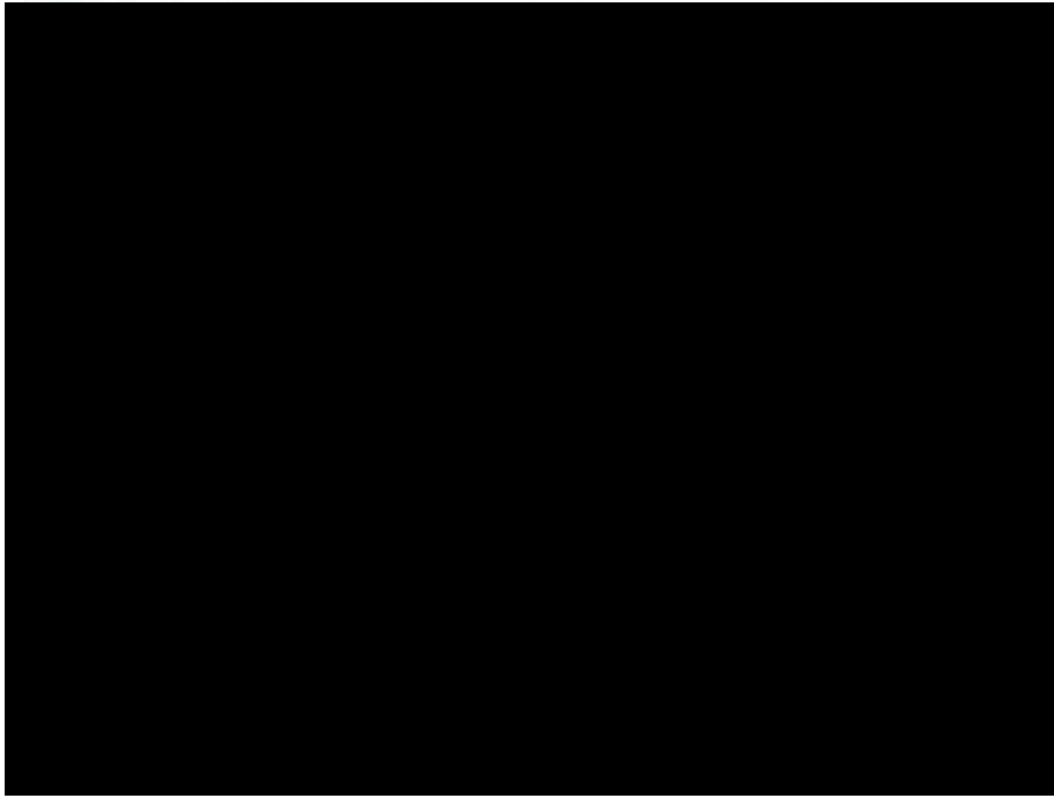
The modification does not appear to be common to any other Samsung non-MST phone, which suggests it was done only for the purposes of this litigation. RX-1672C (Choe) at Q/A 72-76. Tellingly, despite the ALJ’s view that the PowerPoint slides were not the type of technical documentation one would expect to see in this industry, Samsung produced nothing more at the hearing in this matter, and admitted that there is nothing more (*see* further discussion, *infra*).

Id. For Software-Modified Products, Dynamics makes similar criticisms regarding the PowerPoint slides which defined the redesign. *See id.* at 104-105 (citing RX-0087C; RX-0088C). Overall, Dynamics contends “there is no evidence that the Redesigned Products underwent any testing necessary to be released to the market” and “[t]he lack of documentation for Samsung’s allegedly-existing Redesigned Products stands in stark contrast to the volumes of documentation Samsung produced for its Accused Products showing how the Accused Products are made, including specification sheets, user manuals, and other documents” *Id.* at 105; CRB at 12-13 (citing, *inter alia*, Order No. 19 at 5; *Certain Unmanned Aerial Vehicles and Components Thereof*, Inv. No. 337-TA-1133, Comm’n Op. (Sep. 8, 2020) (“*Aerial Vehicles*”); Hr’g Tr. at 426:23-427:4, 430:6-10, 432:3-433:3, 430:6-10). Dynamics states, “[t]he Hardware Modified Products are not fixed in design, so there is no way to determine whether they infringe” and, for example, that without proper schematics “Dynamics has no way of knowing whether they lack any alternative means of supplying power to the MST antenna.” CRB at 17-18. Additionally, Dynamics contends

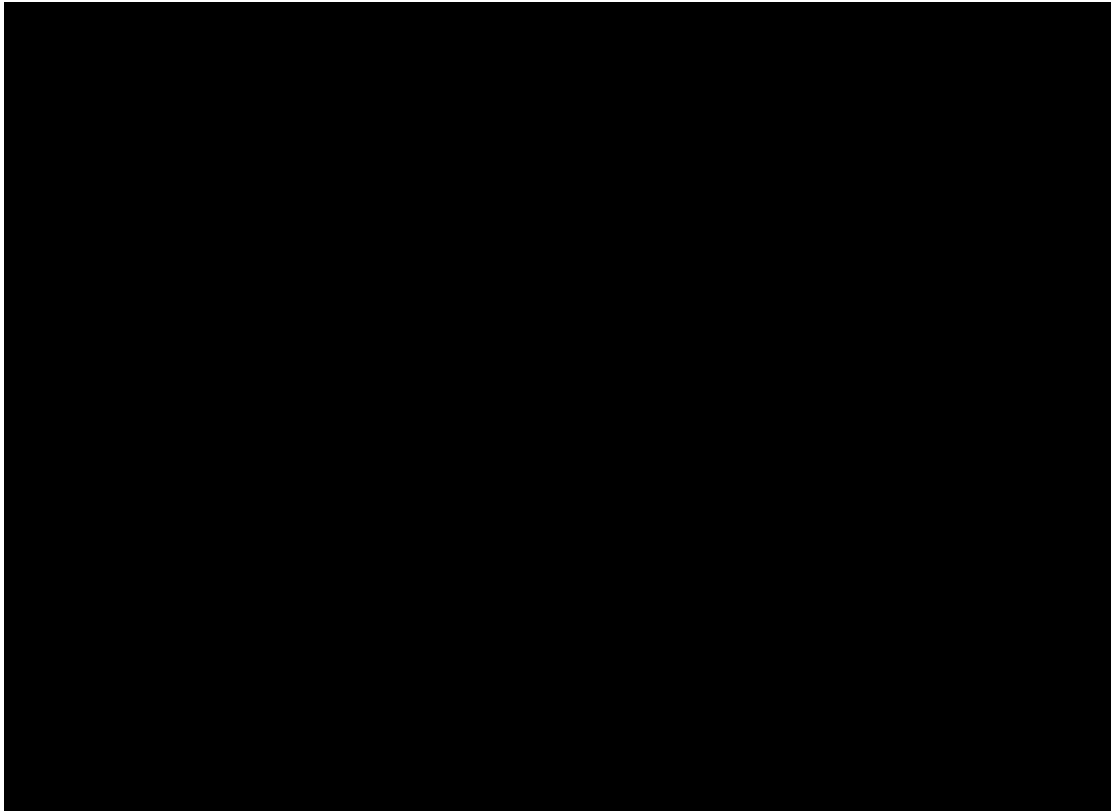
[REDACTED]

“the modifications made to the Hardware Modified Products are not like any other designs included in other non-MST products (*e.g.*, non-MST products sold in other regions do not include MST antennas, while the Hardware Modified Products continue to include MST antennas).” *Id.* at 18 (citing Hr’g Tr. at 454:1-455:12).

It is more likely than not the Hardware-Modified Products are sufficiently “fixed in design” for the Commission’s attention. Importantly, these products are not redesigns in the familiar sense (*e.g.*, achieve the same functionality in a non-infringing manner); they are the original Accused Products with, literally, an MST-critical circuit element ripped out:



RX-0086C at *4;



RX-0085C at *3; *see* RX-1670C at Q/A 30-37, 48-54. If this is the design Samsung seeks adjudication of (*i.e.*, an otherwise complete Accused Product with this one circuit element removed or never installed), then it is fixed. As the design reflects a willingness to forego the functionality giving rise to Dynamics’ claim of infringement (MST), it stands in stark contrast to the redesigns in, for example, *Aerial Vehicles*. Those redesigns were similarly altered to avoid infringement but also to preserve the original functionality. *See Aerial Vehicles*, Inv. No. 337-TA-1133, Comm’n Op. at 22-23. But the redesigns had not been shown to ever be included within or usable with the actual, complete UAV products before the close of fact discovery. *See id.* (holding a redesign is “not just any component[] without a clear connection to a complete or accused UAV product.”). Hence, there was no showing of “fixed in design.” *Id.* at 24-25.

Here, it is clear what the final product will be—an exact copy of the Accused Product with exposed contacts where a circuit switch element had been (*i.e.*, the right images shown above).

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While this would not seem to be commercially feasible for newly manufactured products (wasted circuit board space, ancillary components, signal lines, etc.), it is a design Samsung claims can be sold (RIB at 39) and wants to adjudicate.

The Software-Modified Products are similarly situated. They too involve an otherwise identical copy of an Accused Product but with certain lines of driver code, previously present, but later deleted. RX-1672C at Q/A 24-28, 46-50; RX-0088C at *2; RX-0087C at *2.

As to Dynamics' complaints over documentation (CIB at 104; CRB at 13), the testimony from Samsung's software (Mr. Choe) and hardware (Mr. Lee) engineers, emphasizing the transferability of existing documentation to the redesigns, is credible and persuasive (*see* RX-1672C at Q/A 19, 39-41, 60-62, 77-80; RX-1670C at Q/A 45-47, 61-63). The modifications described above are so minor and involve only the removal of existing componentry or code, they are akin to a line item in a manual describing a variant product (*e.g.*, difference between 10 and 10X smartphone models is extra memory). For example, a single Samsung User manual covers all of Galaxy models S10e/S10/S10+. RX-1097. In another example, Dynamics itself uses the "Product Requirements document, specifications, and features of its C6 Bank device to refer to the specifications, features, and requirements of the Emirates NBD device," even though there is a very notable difference between those two products—cellular connectivity. *See* CIB at 33-34. From this perspective, then, the total documentation for the Hardware-Modified and Software-Modified Products evidencing a fixed design includes existing documentation for the original Accused Products and is considerable.

As to Dynamics' arguments over testing (CIB at 105), Dynamics is correct that testing is important "in industries such as secure payment transactions," but it is entirely unclear how the unavailability of a payment method would require testing, and Dynamics offers no suggestion.



See id. As to Dynamics’ references to the summary determination phase of this investigation, and Samsung’s denied motion on this topic (CIB at 103; CRB at 14-17), the record is now complete.

It is also more likely than not the Hardware-Modified Products and Software-Modified Products were “sufficiently disclosed by respondent during discovery” under factor (4). Samsung argues “[t]wenty-four fully operational Modified Products were imported during fact discovery in this case” with five of them produced to Dynamics. RIB at 40 (citing RX-1472C; RX-1473C; RX-1619C; RX-1620C; RX-1621C; RPX-0038; RPX-0040; RPX-0042; RPX-0044; RPX-0046). Samsung claims it made available all source code “to create the binaries” for the redesigned and Accused Products during fact discovery (*id.* at 40 n.4) and produced the four modification PowerPoint slide decks “explaining all the differences between the Modified Products and the currently sold versions of these products” (*id.* at 40-41 (citing, *inter alia*, RX-0085C; RX-0086C; RX-0087C; RX-0088C)). Further, Samsung points to its discovery responses in this investigation, “offering contentions regarding these products in response to multiple interrogatories beginning more than six weeks before the end of fact discovery and ten days before its first corporate representative on the Modified Products was deposed.” *Id.* at 41 (citing CX-0779C at *11-12, 14-15, 17, 36; CX-0780C at *11-12, 15-17, 19, 38-39; CX-0783C at *74-75, 87-89, 91-92, 111-112, 117, 120, 124, 128, 136, 138-139). Samsung adds that at no time did Dynamics move to compel additional information on these products, or argue it had insufficient ability to depose Samsung’s witnesses on the same. *See id.* at 42. Compared to the much more limited discovery provided by the respondent in, for example, *Oligosaccharides* (discussed above), Samsung’s present efforts are sufficient.

Dynamics’ arguments to the contrary are rooted in an incorrect standard. Dynamics argues there is a need for “extensive” discovery, or discovery “‘equivalent’ to the discovery provided on

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products already determined to be in the investigation.” CIB at 106 (citing *Certain Two-Way Radio Equip. & Sys., Related Software & Components Thereof*, Inv. No. 337-TA-1053, Comm’n Op. at 24 (Dec. 18, 2018) (“*Two-Way Radio*”). The Commission clarified in *Oligosaccharides*, however, that the standard is not so rigorous—instead, “the test requires discovery that is sufficient for the complainant to assess the features relevant to the asserted patent claims.” Inv. No. 337-TA-1120, Comm’n Op. at 20 n.22. Again, considering the relevant feature in the redesigned products is actually the absence of componentry or code, the above discovery, including MST-impaired physical samples, is sufficient to assess infringement.

Accordingly, the Hardware-Modified and Software-Modified Products will be considered for infringement under the Asserted Patents.

II. STANDARDS OF LAW

A. Standing

Commission Rule 210.12 states in relevant part “[f]or every intellectual property based complaint (regardless of the type of intellectual property involved), [the complaint must] include a showing that at least one complainant is the owner or exclusive licensee of the subject intellectual property.” 19 C.F.R. § 210.12(a)(7). In determining whether this rule is met, the Commission looks to the standing requirement used by courts in patent infringement cases. *Certain Audio Processing Hardware, Software, and Products Containing the Same*, Inv. No. 337-TA-1026, Comm’n Op. at 9 (April 18, 2018) (citations omitted).

B. Claim Construction

“The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.” *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). Although most of the disputed

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claim terms were construed in an earlier order, some of the issues presented below are only resolvable with additional claim construction.

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Markman v. Westview Instr., Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc). As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Id.* at 1314; *see Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”). The context in which a term is used in an asserted claim can be “highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.* “Courts do not rewrite claims; instead, we give

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effect to the terms chosen by the patentee.” *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316.

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips*, 415 F.3d at 1317; see *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”).

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* “The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with

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the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention;” or (2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); *see Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring “expressions of manifest exclusion or restriction,

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representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted).

C. Infringement

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing.” *Markman*, 52 F.3d at 976.

A patentee may prove infringement either literally or under the doctrine of equivalents. Infringement of either sort must be proven by a preponderance of the evidence. *SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 889 (Fed. Cir. 1988). A preponderance of the evidence standard “requires proving that infringement was more likely than not to have occurred.” *Warner-Lambert Co. v. Teva Pharm. USA, Inc.*, 418 F.3d 1326, 1341 n.15 (Fed. Cir. 2005).

Literal infringement, a form of direct infringement, is a question of fact. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1332 (Fed. Cir. 2008). “To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly.” *Microsoft Corp. v. GeoTag, Inc.*, 817 F.3d 1305, 1313 (Fed. Cir. 2016) (quoting *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995)). If any claim limitation is absent, there is no literal infringement of that claim as a matter of law. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000).

D. Domestic Industry

In an investigation based on a claim of patent infringement, Section 337 requires that an industry in the United States, relating to the articles protected by the patent, exist or be in the process of being established. 19 U.S.C. § 1337(a)(2). Under Commission precedent, the domestic

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industry requirement has been divided into (i) a “technical prong” (which requires articles covered by the asserted patent) and (ii) an “economic prong” (which requires certain levels of activity with respect to the protected articles or patent itself). *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm’n Op. at 6-7 (April 14, 2011) (“*Video Game Systems*”).

1. Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. §§ 1337 (a)(2), (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 8 (U.S.I.T.C. Jan. 16, 1996). “In order to satisfy the technical prong of the domestic industry requirement, it is sufficient to show that the domestic industry practices any claim of that patent, not necessarily an asserted claim of that patent.” *Certain Ammonium Octamolybdate Isomers*, Inv. No. 337-TA-477, Comm’n Op. at 55 (U.S.I.T.C. Aug. 28, 2003). Historically, the Commission permits the complainant’s products, and those of its licensees, to be considered for technical prong purposes. *See Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 28-29 (April 9, 2019).

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement. *See Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109 (U.S.I.T.C. May 21, 1990), *aff’d*, Views of the Commission at 22 (U.S.I.T.C. Oct. 31, 1990); *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). “First, the claims of the patent are construed. Second, the complainant’s article or process is examined to determine whether it falls within the scope of the claims.” *Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109. As with infringement, the technical prong of the domestic industry can be

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satisfied either literally or under the doctrine of equivalents. *Certain Dynamic Sequential Gradient Devices and Component Parts Thereof*, Inv. No. 337-TA-335, ID at 44, Pub. No. 2575 (U.S.I.T.C. May 15, 1992). In short, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent.

2. Economic Prong

The “economic prong” of the domestic industry requirement is satisfied when there exists in the United States, in connection with products practicing at least one claim of the patent at issue: (A) significant investment in plant and equipment; (B) significant employment of labor or capital; or (C) substantial investment in its exploitation, including engineering, research and development, and licensing. 19 U.S.C. § 1337(a)(3). Establishment of the “economic prong” is not dependent on any “minimum monetary expenditure” and there is no need for complainant “to define the industry itself in absolute mathematical terms.” *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm’n Op. at 25-26 (May 16, 2008) (“*Stringed Instruments*”). However, a complainant must substantiate the significance of its activities with respect to the articles protected by the patent. *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 30 (Feb. 17, 2011) (“*Imaging Devices*”). Further, a complainant can show that its activities are significant by showing how those activities are important to the articles protected by the patent in the context of the company’s operations, the marketplace, or the industry in question. *Id.* at 27-28. That significance, however, must be shown in a quantitative context. *Lelo Inc. v. Int’l Trade Comm’n*, 786 F.3d 879, 886 (Fed. Cir. 2015). The Federal Circuit noted that when the ITC first addressed this requirement, it found the word “‘significant’ denoted ‘an assessment of the *relative* importance of the domestic activities.’” *Id.* at 883-4 (internal citation omitted) (emphasis added). In general, “[t]he purpose of the domestic industry requirement is to prevent the ITC from becoming a forum for resolving

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disputes brought by foreign complainants whose only connection with the United States is ownership of a U.S. patent.” *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, Initial Determination at 21 (Aug. 1991).

E. Invalidity

1. 35 U.S.C. § 102

Pursuant to 35 U.S.C. § 102, a patent claim is invalid as anticipated if:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant;

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States;

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent;”

(g)(2) before such person’s invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it.

35 U.S.C. § 102 (pre-AIA). “A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention. Moreover, a prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citations omitted); *see Santarus, Inc. v. Par Pharm., Inc.*, 694 F.3d 1344, 1354 (Fed. Cir. 2012). “A century-old axiom of patent law holds that a product ‘which would literally infringe if later in time anticipates if earlier.’” *Upsher-Smith Labs., Inc. v. PamLab, L.L.C.*, 412 F.3d 1319, 1322 (Fed. Cir. 2005) (citing *Schering Corp.*, 339 F.3d at 1322). Anticipation, and all other grounds of patent invalidity, must be proved by clear and convincing evidence. *Microsoft Corp. v. I4I Ltd. P’ship*, 564 U.S. 91, 95, (2011).

2. 35 U.S.C. § 103

Section 103 of the Patent Act states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103(a) (pre-AIA). “Obviousness is a question of law based on underlying questions of fact.” *Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1379 (Fed. Cir. 2008). The underlying factual determinations include: “(1) the scope and content of the prior art, (2) the level of ordinary skill in the art, (3) the differences between the claimed invention and the prior art, and (4) objective indicia of non-obviousness.” *Id.* (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)). These factual determinations are often referred to as the “Graham factors.”

The critical inquiry in determining the differences between the claimed invention and the prior art is whether there is a reason to combine the prior art references. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-21 (2007). In *KSR*, the Supreme Court rejected the Federal Circuit’s rigid application of the teaching-suggestion-motivation test. While the Court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does,” it described a more flexible analysis:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court

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can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Id. at 418.

Since *KSR*, the Federal Circuit has announced that, where a patent challenger contends that a patent is invalid for obviousness based on a combination of prior art references, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device . . . and would have had a reasonable expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 399 (“The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor.”). In addition to demonstrating that a reason exists to combine prior art references, the challenger must demonstrate that the combination of prior art references discloses all of the limitations of the claims. *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1373-4 (Fed. Cir. 2010) (abrogated on other grounds by *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S.Ct. 2120 (2014)) (upholding finding of non-obviousness based on the fact that there was substantial evidence that the asserted combination of references failed to disclose a claim limitation); *Velander v. Garner*, 348 F.3d 1359, 1363 (Fed. Cir. 2003) (explaining that a requirement for a finding of obviousness is that “all the elements of an invention are found in a combination of prior art references”).

An obviousness determination should also include a consideration of “secondary considerations,” that is, “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Graham*, 338 U.S. at 17-18. “For [such] objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of

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the claimed invention.” *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995); *see Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 837 (Fed. Cir. 2015). “Where the offered secondary consideration actually results from something other than what is both claimed and novel in the claim, there is no nexus to the merits of the claimed invention.” *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011); *see Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1054-1056 (Fed. Cir. 2016).

3. 35 U.S.C. § 112

Pursuant to 35 U.S.C. § 112, a patent claim is invalid for lack of written description if the patent’s specification fails to “reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). “[T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art” (*id.*), and “the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology” (*id.* (citing *Capon v. Eshar*, 418 F.3d 1349, 1357-58 (Fed. Cir. 2005))).

Additionally, under 35 U.S.C. § 112, a patent claim is invalid for indefiniteness if “its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). Indefiniteness can result from a single claim covering both an apparatus and a method of use of that apparatus, as “a manufacturer or seller of the claimed apparatus would not know from the claim whether it might also be liable for contributory infringement because a buyer or user of the apparatus later performs the claimed method using the apparatus.” *IPXL Holdings v. Amazon.com*, 430 F.3d 1377, 1384 (Fed. Cir. 2005); *see UltimatePointer, L.L.C. v. Nintendo Co.*, 816 F.3d 816, 826 (Fed. Cir. 2016) (holding these types of claims may make it “unclear whether infringement . . . occurs when one

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creates an infringing system, or whether infringement occurs when the user actually uses the system in an infringing manner”) (citation omitted). “[A]pparatus claims are not necessarily indefinite for using functional language,” however, as in, for example, means-plus-function claims. *MasterMine Software, Inc. v. Microsoft Corp.*, 874 F.3d 1307, 1313 (Fed. Cir. 2017) (citing *Microprocessor Enhancement Corp. v. Tex. Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008)). Another example may be when the claim merely recites “that the system ‘possesses the recited structure which is capable of performing the recited functions.’” *Id.* at 1315-16 (quoting *Microprocessor Enhancement*, 520 F.3d at 1375). Overall, “the written description is *key* to determining whether a term of degree is indefinite.” *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1361 (Fed. Cir. 2019) (citing *Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017)) (emphasis in original).

Further, under 35 U.S.C. § 112, a patent specification must contain a description “of the manner and process of making and using” the invention. 35 U.S.C. § 112. This is referred to as the enablement requirement, and a patent claim is sufficiently enabled only when the specification teaches “those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation.” *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997). To determine whether the specification leaves a person of ordinary skill to perform undue experimentation, the Federal Circuit has identified the following factors to consider: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. *In re Wands*, 585 F.2d 731, 737 (Fed. Cir. 1988). “[I]t is not necessary that a court review all the *Wands* factors to find a disclosure enabling. They are

[REDACTED]

illustrative, not mandatory.” *Amgen, Inc. v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200, 1213 (Fed. Cir. 1991).

III. IMPORTATION AND JURISDICTION

The parties stipulated to facts establishing the importation requirement is met for both respondents. *See id.* at 16 (citing EDIS Doc. ID 696214; CX-0767C – CX-0771C). Moreover, Samsung does not dispute the Commission’s jurisdiction over this investigation or that the requisite importation or sale in connection with importation has taken place for each Accused Product. *See* RIB at 14 (citing CX-0767C – CX-0771C). Accordingly, the importation requirement under 19 U.S.C. § 1337(a)(1)(B) is satisfied, and the Commission has *in rem* jurisdiction over the Accused Products.

IV. U.S. PATENT NO. 8,827,153

A. Level of Ordinary Skill in the Art

A person having ordinary skill in the art of the 153 patent at the time of invention “would have: an undergraduate degree in computer science, electrical engineering, or the equivalent (including computer engineering) and at least three years of experience with point of sale systems and the use of magnetic fields to convey information.” Order No. 7 at 7. The parties do not challenge this definition (*see* CIB at 9; *see generally* RIB; RRB), and it is applied throughout this initial determination.

B. Claims-at-Issue

Claims 1 and 7 of the 153 patent are at issue in this investigation, either through allegations of infringement or domestic industry technical prong. *See* CIB at 28, 34-36. They are reproduced below:

1. A device comprising:

a magnetic stripe emulator operable to communicate an analog waveform encoded with at least one track of magnetic stripe data to a magnetic stripe reader; and

a waveform generator operable to generate said analog waveform from a digital representation of said at least one track of magnetic stripe data,

wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data.

....

7. The device of claim 1, wherein said analog waveform is encoded with two tracks of magnetic stripe data.

153 patent at cls. 1, 7.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 153 patent were construed, either as agreed between the parties or determined by Order No. 7:

Claim Term	Construction
“wherein device is operable to retrieve said digital representation”	“wherein said device is operable to read said digital representation from memory”
“plurality”	“more than one”
“digital representation of said at least one track of magnetic stripe data”	“digital information that represents said at least one track of magnetic stripe data”
“magnetic stripe emulator”	“a device that emulates a magnetic stripe”

See Order No. 7 at 18, 21, 22.

1. “at least one track of magnetic stripe data”

During the *Markman* process, the parties sought construction of the term “at least one track of magnetic stripe data” in the 153 patent, but, for reasons explained in Order No. 7, the term was not construed. Order No. 7 at 19-20. Now, in its initial post-hearing brief, Dynamics offers “at

[REDACTED]

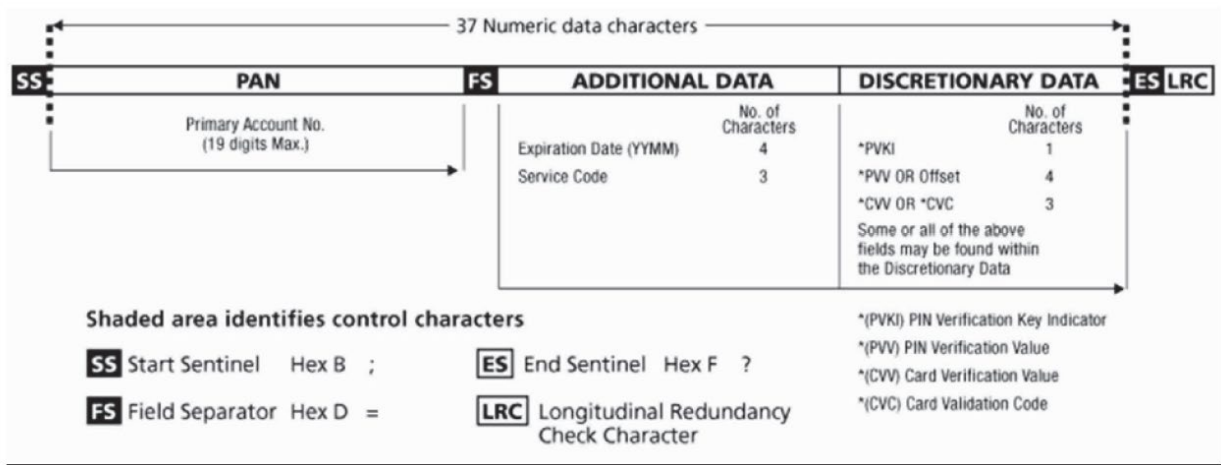
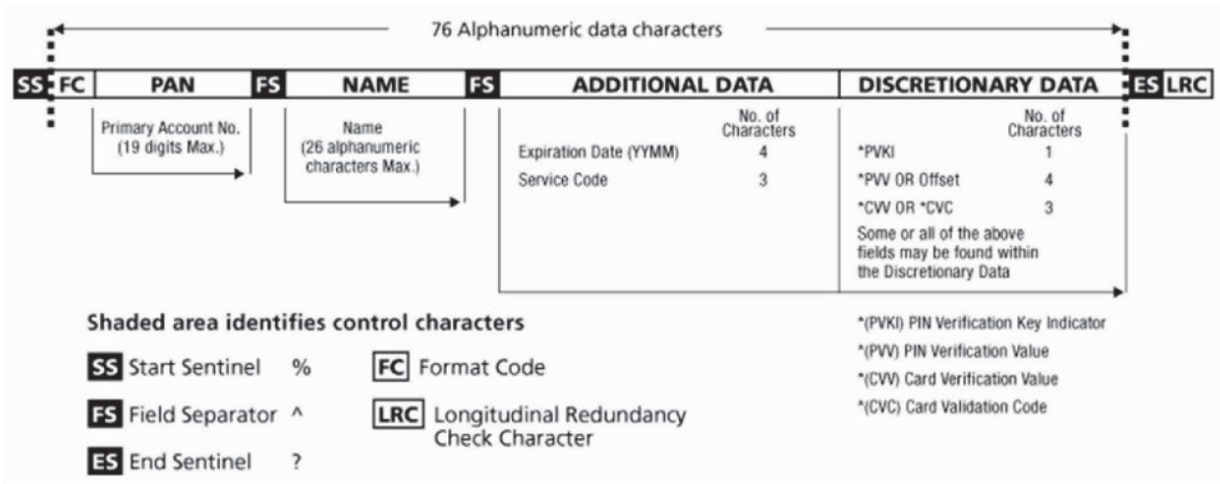
least one set of data encoded in magnetic stripe format.” CIB at 19. Dynamics argues this broad construction satisfies Order No. 7’s supposition that claim 1 of the patent “may be operable merely by communicating, say, test data, or data otherwise encoded in magnetic stripe format but not used for payment purposes.” *Id.*; *see* Order No. 7 at 20.

Samsung argues Dynamics has improperly raised this construction for the first time in its post-hearing brief under Ground Rules 9.2 and 13.1, and, further, that it does not touch on any issue in the investigation. *See* RRB at 2-3 (“[The construction dispute was] subsequently resolved without the need for construction when Dynamics withdrew the infringement argument which gave rise to the dispute in the first place.”). Thus, Samsung reasons, no construction is necessary. *Id.* Regardless, if construed, Samsung contends “track” should receive its plain and ordinary meaning, which is that data set “defined by ISO standards 7813 and 4909 as having a particular format that starts with a start sentinel, and includes an end sentinel and certain other data.” *Id.* at 3 (citing, *inter alia*, RX-1675C at Q/A 341; RX-1677C at Q/A37-38; CX-1199C at Q/A 53; CIB at 19; 153 patent at 2:18-22, 2:25-28, 5:46-50; 5:57-60). Samsung argues the broader word “set” should not be substituted for the specific “track” given this ordinary meaning. *Id.*

The term is material and must be construed. One of Samsung’s three disputes concerning the limitation “wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data” under infringement of claim 1 turns on the scope of a “track of magnetic stripe data.” *See* RIB at 33 (arguing leading and trailing zeros do not fall within the scope of that term). Claim 7 is also implicated. *See* CIB at 32 (arguing “[e]ach version of track 2 data is a digital representation of the same track, and may be considered in fact a track itself”).

Hence, a construction is necessary, and Samsung's is more persuasive. Dynamics' construction, "at least one set of data encoded in magnetic stripe format," reads out "track." This is not preferred, given the importance and well-defined nature of "track" data in the payment card industry (*i.e.*, to persons of ordinary skill in the art). *Phillips*, 415 F.3d at 1313 (holding words should generally receive their plain and ordinary meaning to those of ordinary skill in the art at the time of invention). Mr. Zatkovich explains how magnetic stripe cards are known to store "three different formats of data. Those formats are called 'tracks.' Track 1; Track 2; and Track 3." CX-1199C at Q/A 53. "Each track encodes their data using the F2F scheme, but each track records the information at different densities (bits per inch), which allows for more or less data in each track." *Id.* Below are images, provided at the Joint Technology Tutorial prior to the *Markman* hearing and cited by Mr. Zatkovich, which clearly explain the unique character of each of the three types of "track[s] of magnetic stripe data," and additional information on Track 1 and Track 2 (respectively):

0.223" ↑ ↓	Track		Recording Density (bits per inch)	Character Configuration (including parity bit)	Information Content (including control characters)
0.110"	1	IATA	210	7 bits per character	79 alphanumeric characters
0.110"	2	ABA	75	5 bits per character	40 numeric characters
0.110"	3	THRIFT	210	5 bits per character	107 numeric characters



RX-1575 at *6-8; *see* CX-1199C at Q/A 32 (recognizing read data as Track 2), 53; RX-1629C at *17-25 (ISO 6811 standard specifying of each of tracks 1, 2, 3); RX-0321 (ISO 7813 standard); RX-0319 (ISO 7813 standard). The 153 patent specification suggests an awareness of these details. 153 patent at 10:30-40 (describing ‘magnetic stripe message’ with “one, two, and/or three tracks” that “may define payment account and cardholder information”).

Dynamics’ inclusion of the phrase “encoded in magnetic stripe format” does not make up for the loss of “track of magnetic stripe data.” The encoding of data in a signal (*e.g.*, F2F or other scheme) is a separate concept from the nature of that data (*e.g.*, a specified identity of characters, in a certain order). This is shown, at least, in the ISO 7811 standard, which clearly differentiates

[REDACTED]

between the data which makes up each of tracks 1, 2, and 3 (RX-1629C at *19-24) and its flux transition-encoding (*id.* at *16). The 153 patent makes the same distinction. 153 patent at 10:30-40 (disclosing a “magnetic stripe message” defining payment account and cardholder name, that is then encoded).

Samsung’s construction explicitly aligns with the well-defined meaning within the industry—“at least one track of magnetic stripe data as defined by the ISO standards.” RRB at 3. Accordingly, it is adopted.

2. “a device”

Dynamics additionally argues that the preamble of claim 1, “a device,” should be construed as limiting and given its plain and ordinary meaning of “one device.” CIB at 19-20. Dynamics contends “[c]onstruction of the preamble is appropriate given Samsung’s invalidity positions.” *Id.* at 20. Similar to “at least one track of magnetic stripe data,” Samsung argues “[b]ecause no issue in this case depends on construing this preamble, no construction is required.” RRB at 3. Samsung also explains why, if considered, the preamble is not limiting. *See id.* at 3-4.

No construction is necessary. While Dynamics argues that construction of the preamble of claim 1 of the 153 patent is “appropriate given Samsung’s invalidity positions” (CIB at 20), it does not argue the term is unmet by Samsung’s prior art (*see* CIB at 36-40; CRB at 19-25). Thus, a construction at this time could only resolve a dispute where none exists. *See U.S. Surgical*, 103 F.3d at 1568; *O2 Micro*, 521 F.3d at 1362.

3. “analog waveform”

Claim 1 recites a magnetic stripe emulator “operable to communicate an analog waveform . . . to a magnetic stripe reader,” and a waveform generator “operable to generate said analog waveform from a digital representation of” magnetic stripe data. 631 patent at cl. 1. The parties dispute the meaning of “analog waveform.” *See* CIB at 23-27; RIB at 15-22. Both sides offered

[REDACTED]

a considerable amount of hearing evidence in support of their respective positions, including extensive expert testimony. *E.g.*, Hr’g Tr. at 208:23-24 (Mr. Zatkovich testifying that “an F2F encoded signal is always analog”). This term was not construed during the *Markman* process, however, nor did the parties’ pre-hearing briefs treat the dispute as one involving claim construction. *See* Order No. 7 at 18-22; *e.g.*, CPB at 30-34. The parties were therefore directed to brief their positions from a claim construction perspective. *See* Hr’g Tr. at 908:14-909:16.

The parties’ post-hearing briefs spell out their respective claim construction proposals. *See* CIB at 23 (“a waveform that conveys information in a non-binary manner”); RIB at 15 (“a wave shape whose amplitude changes in a continuous fashion”). Unfortunately, neither proposal is especially well-supported by the intrinsic evidence, as explained below.¹ Fortunately, I am not obliged to accept one or the other proposed construction; an adjudicator “may adopt a definition not proposed by either party that best fits with the claim language and the specification.” *See Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372, 1376 (Fed. Cir. 2017). Moreover, under the circumstances the claims need not even be construed in the usual sense. *See O2 Micro Intern. Ltd. v. Beyond Innovation Technology Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (citations omitted) (“claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims,

¹ Expert testimony on the meaning of a claim term is a form of extrinsic evidence. *Phillips*, 415 F.3d at 1317. I generally accord the testimony on this issue from both parties’ experts little weight, because both offered self-contradicting opinions. *See* Hr’g Tr. at 552:25-554:23 (Dr. Apsel opining digital/analog waveform distinction “depend[s] on where the information is contained”), 554:24-555:8 (Dr. Apsel opining discrete signal levels are “what digital is about”), 602:4-17 (Dr. Apsel opining encoding is irrelevant “it’s the shape of the wave defines whether it’s analog or digital”), 309:17-310:9 (Mr. Zatkovich opining “that’s why the shape of the wave itself does not determine” if it is analog or digital), 188:10-190:7 (Mr. Zatkovich agreeing “waveform” refers to the graphical shape), 322:19-323:10 (Mr. Zatkovich opinion exact same shape waveform could be analog or digital, as it is the receiver that controls the characterization).

[REDACTED]

for use in the determination of infringement”). Four points suffice to explain why.

First, Dynamics makes no argument for either infringement or domestic industry technical prong under any claim construction except its own. *See* CIB at 29-31, 35; CRB at 8-11, 19. It is entirely unclear what Dynamics’ position is on the shapes of the relevant signals in the Accused Products and the DI Products, or on how their amplitudes change. So Dynamics’ technical prong case for claim 1 of the 153 patent rises or falls entirely on whether its proposed claim construction is accepted—although, as explained below, its infringement case does not.

Second, that proposed claim construction is not well-taken. Dynamics’ proposal links “analog” to whether or not the analog waveform conveys information. CIB at 24 (“a waveform that conveys information in a non-binary manner”). But this precludes “analog waveforms” from existing in electrical systems which do not convey information (*e.g.*, power delivery). So Dynamics’ proposed construction does not use the term’s plain and ordinary meaning, as any high school science student would understand after an experiment with signal generators and oscilloscopes, or an electrician installing a dimming light switch.

Dynamics further contends that “the patent defines analog waveforms, and the digital representations thereof, by the environment and conditions in which analog waveforms and digital representations store, retrieve, and communicate data.” CIB at 25. Certainly the specification sheds light on the issue, but each of Dynamics’ citations are merely statements of how the analog waveform is used in the invention and not what is meant by “analog.” *See* CIB at 24 (citing 153 patent at 2:14-22), 25 (citing 153 patent at 12:46-13:4), 25-26 (citing 153 patent at 9:25-51), 26 (citing 153 patent at 10:10-18, 12:65-[13]:4); CRB at 3-4 (citing 153 patent at Fig. 3, 10:19-44, 11:19-27, 11:35-48), 4-5 (citing 153 patent at Fig. 3, 11:38-48, 3:52-55). Moreover, adopting Dynamics’ approach would be no different from finding a plain and ordinary meaning of “magnet”



as “a polarized substance used to store information” because of how magnets are used in the 153 patent, even though magnets are plainly and ordinarily used for purposes apart from information storage.

Dynamics also states “[b]ecause the frequency is what communicates data, rather than the amplitude, the waveform is an analog waveform.” CIB at 27. The logical extension here is that any signal which conveys information through amplitude cannot be “analog.” The basic principles of communication signals discussed in the extrinsic evidence prove this is not the case. *See, e.g.*, RX-1640 at *5 (“Many signals can be used in either the analog or digital sense, the means of carrying the information being the distinguishing feature. The information content of an analog signal is conveyed by the value or magnitude of some characteristic(s) of the signal such as amplitude, frequency, or a phase of a voltage, the amplitude of duration of a pulse . . .”).

Dynamics also contends that “[t]he shape of a waveform should have no bearing on the construction of the term ‘analog waveform’ because the shape is non-existent in the intrinsic record.” CIB at 27; *see id.* at 24 (“Thus, the ’153 patent does not teach that a particular shape of a waveform is relevant to communication of data to a magnetic stripe card reader.”). This is demonstrably incorrect. The patent explicitly discusses how waveform shape (apart from the underlying, encoded data) can be tailored for successful communication between the emulator and the reader:

Detector 166 may, for example, detect a direction and velocity of movement of a read-head of a magnetic stripe reader and report such detected direction and velocity to processor 154. Processor 154 may, in turn, report the direction and velocity of movement to ASIC 164, which may in turn generate one or more waveforms that are compatible with the detected direction and velocity of movement of the detected read-head of the magnetic stripe reader.

id. at 8:7-14;

For example, a temperature detector of a card may detect an ambient temperature (e.g., as in step 504) of the environment that a card may be operating within. A



processor of a card may, for example, select a digital waveform (e.g., as in step 506) that contains the requested account information (e.g., the requested rewards account information), but that also exhibits characteristics that are known to a processor of the card to be optimal based upon a card's detected ambient temperature. Accordingly, successive conversion of all symbols of the selected digital waveform may yield waveform 510 (e.g., as in step 508) having optimized characteristics (e.g., extended amplitudes 512 and 514) that may be known to a processor of a card to be optimized when the card is used in the detected ambient temperature of step 504.

Persons skilled in the art will appreciate that modifying any characteristic of an analog signal may yield optimized results. Accordingly, other characteristics (e.g., rate of change of an amplitude of a signal) may be used to optimize communication of a waveform. Persons skilled in the art will further appreciate that other environmental factors (e.g., relative humidity) may be detected which may effect other characteristic changes to be employed within a waveform to optimize communication of the waveform.

id. at 13:40-62; *see id.* at 13:26-39 (“Each numerical representation of a waveform having the same account information encoded within the waveform may, for example, exhibit different characteristics that may be useful depending upon an environment that the card may be operating within”), 12:23-45 (“For example, data symbols retrieved from memory 316 may be modified to produce waveform characteristics that are optimized for use with a detected magnetic stripe reader type.”), 11:53-67, 10:61-11:3, 3:41-51, 2:66-3:11. Again, these passages do not define “analog,” but they do teach that the shape of an analog waveform is relevant to the invention’s operation.

The idea that wave shape is not relevant to whether a waveform is “analog” is actually undone by Dynamics’ own construction. There is no debate that, according to the 153 patent, the one waveform illustrated in the patent’s Figures is “analog”:



153 patent at Fig. 4; *see id.* at Figs. 5, 6, 12:46-61; CIB at 25; RIB at 17. The 1 and 0 annotations indicate that the information in the signal is conveyed in a binary, not a non-binary, manner. The only way Dynamics' construction works is to understand the waveform as conveying binary information (*i.e.*, 1s and 0s) in a continuous (*i.e.*, non-binary) manner. Indeed, Dynamics agrees that, consistent with the preferred embodiment (the F2F encoding scheme), signal level transitions are the mechanism by which the information is conveyed. *See, e.g.*, CIB at 24-27; CRB at 4; 153 patent at 10:36-40 ("The magnetic stripe message may, for example, be encoded (e.g., F2F encoded) such that a logic "1" may be encoded as a transition within any bit period and a logic "0" may be encoded as a lack of a data transition within any bit period."). Transitions, though, are inherently continuous and require periodic verticality in the wave shape.

Third, Dynamics does not dispute that the prior art Samsung cites for its invalidity case discloses an analog waveform. This is hardly surprising, because that prior art, U.S. Patent No. 6,206,293 ("Gutman"), teaches F2F encoding, thereby falling within the scope of Dynamics' proposed construction of "analog waveform." *See* RX-0877 at 4:8-18. Dynamics' defense to invalidity instead focuses on other elements. *See* CIB at 38-41.



Fourth, Samsung’s proposed construction, whether it is correct or not, does not actually resolve the parties’ dispute, at least as Samsung presents it. Samsung argues that under its proposal, “a digital waveform—the opposite of an analog waveform—[] is a wave comprised of discrete states, like a square wave;” that is, a square wave is not analog, according to Samsung. RIB at 17. Admittedly, a signal that consists purely of discrete amplitudes would likely not qualify as analog in the context of the 153 patent, but it also would not be a signal “encoded with at least one track of magnetic stripe data,” at least in the preferred embodiment, because it would lack transitions. Therefore, such a signal would fall outside the scope of claim 1 anyway.

Moreover, it is not clear how Samsung’s proposed construction encompasses the one waveform illustrated in the Figures—what one skilled in the art apparently would know as a “Lorentz waveform” (*see* CX-0155C.0025)—while excluding real-world square waves. The Lorentz waveform has an amplitude of zero for most of its length, but is nonetheless continuous and has transitions. *See* 153 patent at Fig. 4 (waveform 408). Similarly, any real-world square wave may have an amplitude at either the maximum or minimum for most of its length, but it is still continuous and has transitions, that is, its amplitude passes through zero and every intervening value between maximum and minimum. And, again, any square wave which would be operative to encode magnetic stripe data using the F2F protocol necessarily would be a real-world, continuous square wave possessing transitions. So under Samsung’s proposed construction, there appears to be no principled distinction between the admittedly analog Lorentz waveform and a square wave.

But the most important problem with Samsung’s proposed construction is that a square wave is seemingly expressly disclosed in the specification of the 153 patent as one embodiment of an analog waveform:



In step 406, the magnetic stripe message may be converted from a digital format to an analog format to produce waveform 408. In particular, a DAC may be used to convert each digital symbol into an analog signal (e.g., a current signal having a magnitude that is proportional to a digital value of the digital symbol and a polarity as defined by a sign bit of the digital symbol). Each digital symbol may be converted to its analog equivalent at a rate that may be defined by a frequency of a clock signal that is provided to the DAC.

153 patent at 12:59-67. To be sure, the passage uses the term “analog signal” rather than “analog waveform,” but nothing in the specification suggests any meaningful difference between the two. And the description of that analog signal apparently corresponds to a square wave, with time on the x-axis and the magnitude of the current on the y-axis, and where the magnitude of the current is “proportional to a digital value of the digital symbol,” that is, except for transitions it is either at its maximum or at zero, assuming the “digital symbol” is either one or zero. *Id.*

The crucial point for claim construction purposes, though, is that any construction consistent with the specification must encompass real-world square waves, whatever the correct construction may be. As explained below, that finding resolves the parties’ dispute over infringement, and the parties’ dispute over domestic industry technical prong does not turn on the proper construction of “analog waveform.” So no formal claim construction is necessary to adjudicate these issues.

In summary: (1) Dynamics advances no infringement or domestic industry technical prong argument under any claim construction theory except its own; (2) that claim construction theory is not meritorious; (3) Dynamics’ defense to invalidity does not depend on the construction of “analog waveform;” and (4) regardless of the proper construction of that term, a real-world square wave falls within its scope. Again, as explained below, this suffices to resolve the parties’ disputes involving this term.

4. “operable to”

A final claim construction dispute exists, one not explicitly briefed by the parties but necessitated by certain non-infringement and technical prong arguments from Samsung. Specifically, and discussed in more detail below, Samsung’s non-infringement positions regarding Accused Product software status at the time of importation, software status of the Software-Modified Products, and technical prong domestic industry via the Emirates NBD device all require determining whether or not the asserted claims of each patent require the necessary software in order to satisfy the “operable to” claim limitation. Consequently, the parties discuss this claim construction issue in varying amounts throughout their briefs. Unfortunately, they do so without reference to particular patent claims.

In its initial brief and with respect to the Software-Modified Products, Dynamics argues “[a] product may infringe a patent if it ‘could be programmed to perform the claimed functionality.’” CIB at 108 (citing *Nazomi Commc’ns, Inc. v. Nokia Corp.*, 739 F.3d 1339, 1344 (Fed. Cir. 2014) (citing *Intel Corp. v. U.S. Int’l Trade Comm’n*, 946 F.2d 821, 832 (Fed. Cir. 1991)); *Silicon Graphics, Inc. v. ATI Techs., Inc.*, 607 F.3d 784, 794 (Fed. Cir. 2010) (“*Silicon Graphics*”)). In its reply brief, Dynamics makes a similar point before emphasizing, presumably for all Asserted Patents, “the asserted claims are device claims that recite capability.” CRB at 7 (citing, *inter alia*, *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1204 (Fed. Cir. 2010)). Thus, for Dynamics, it is sufficient that the Accused Products “include a processor, cellular circuitry, an MST antenna, an NFC antenna, an MST IC or MFC IC, and MST driver software, all of which are used to communicate in various ways with a POS terminal.” *Id.* at 7-8.

In Samsung’s initial brief, it refers to the status of its imported products to argue, “Dynamics cannot show that Samsung directly infringes the ’153 patent or any of the other Asserted Patents because, as imported, the Accused Products require further modification by the

[REDACTED]

end user to enable the accused MST functionality.” RIB at 22. That “modification,” according to Samsung, is the installation of Samsung Pay software or the entry of account information. *See id.* at 22-23; CRB at 10-11. But Samsung offers no explanation for why the 153 patent’s asserted claims require this software. *See* CIB at 22-23. In a discussion of the Software-Modified Products, Samsung advances the point a bit further, arguing the removal of “software needed to power on hardware components necessary for MST” is enough to avoid infringement for any asserted patent. *See generally id.* at 35-38 (citing, *inter alia*, Hr’g Tr. at 278:13-278:18; RX-1675C at Q/A 378; *Nazomi*, 739 F.3d at 1345-46; *High Tech Med. Instrumentation, Inc. v. New Image Indus., Inc.*, 49 F.3d 1551, 1555 (Fed. Cir. 1995)); RRB at 64 (“The Software-Modified Products are not operable for MST unless code not present on the phones is added.”). In particular, Samsung views *Silicon Graphics*, cited by Dynamics, as “mak[ing] clear that infringement of ‘an apparatus claim directed to a computer that is claimed in functional terms’ occurs ‘so long as the product is designed in such a way to enable a user of that [product] to utilize the function . . . without having to modify [the product].’” RRB at 65 (citing *Silicon Graphics*, 607 F.3d at 794). According to Samsung, “[t]he case goes on to explain there can be infringement ‘so long as a user could activate the functions programmed into a piece of software ... only [by] activating means that are already present in the underlying software.’” *Id.* (citing *Silicon Graphics*, 607 F.3d at 795).

In a related discussion of technical prong domestic industry, and the Emirates NBD device, Samsung argues the 545 patent claims were never practiced, because on the one prototype put forward, [REDACTED]

[REDACTED] RIB at 123-124; *see id.* at 124 n.18. Overall, Samsung contends Dynamics never addressed a construction for “operable to” in its pre-hearing brief, and has thus waived any position on the issue. *See* RIB at 23; RRB at 10.



As shown, there is very little discussion by the parties as to why every asserted claim across four different patents requires software. Nevertheless, a review of the caselaw supports finding that the claims of the 153 patent require it.

In *Nazomi*, the Federal Circuit considered claims that “recite a CPU that can perform particular functions, namely, the processing of both register-based and stack-based instructions.” 739 F.3d at 1344. The representative claim was:

48. A central processing unit (CPU) capable of executing a plurality of instruction sets comprising:

an execution unit and associated register file, the execution unit *to execute instructions of a plurality of instruction sets, including a stack-based* and a register-based instruction set;

a mechanism to maintain at least some data for the plurality of instruction sets in the register file, including *maintaining an operand stack for the stack-based instructions* in the register file and an indication of a depth of the operand stack;

a stack control mechanism that includes at least one of an overflow and underflow mechanism, wherein at least some of the operands are moved between the register file and memory; and

a mechanism to generate an exception in respect of selected stack-based instructions.

Id. at 1343-44 (italics in original to show “functionalities that cannot be practiced in hardware alone and require enabling software”). In distinguishing a case which required only that claimed hardware “could be programmed to perform the claimed functionality,” the court held “*Nazomi* has not claimed an apparatus with hardware ‘programmable’ to process stack-based instructions, it has claimed a combination of hardware and software capable of performing that function.” *Id.* at 1344 (citing *Intel*, 946 F.2d at 832; *Fantasy Sports Props., Inc. v. Sportsline.com, Inc.*, 287 F.3d 1108, 1117-8 (Fed. Cir. 2002)). The court continued:

Similarly, in *Silicon Graphics, Inc. v. ATI Technologies, Inc.*, the claims contemplated use in an operating system environment and we overturned the district court's ruling that the accused products did not infringe because they could

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not meet the claim limitations until combined with a computer operating system. 607 F.3d 784, 794–95 (Fed. Cir. 2010). There, the asserted patent claimed a system for rendering graphics, including claims covering a “processor that rasterizes” and a “frame buffer ... for storing” data. *Id.* at 795. The asserted claims contemplated that the claimed hardware would be used in the environment of a standard operating system to perform the claimed processes. *Id.* We construed the claims as requiring hardware that could execute the claimed functionality when combined with the Microsoft Windows operating system. *Id.* at 794. We have repeatedly distinguished a description of the environment in which a claimed invention operates from a limitation on the claimed invention itself. For example, in *Advanced Software Design Corporation v. Fiserv, Inc.*, as in *Silicon Graphics*, the claims were addressed to achieving a particular functionality in “the environment in which the claim operate[d],” and were therefore not “limitations that must be performed by an accused infringer.” 641 F.3d 1368, 1375 (Fed. Cir. 2011). Here, in contrast, the claims do not cover hardware that contemplates an environment where it could be combined with software, but rather require a hardware-software combination that must perform the described functions. We affirm the district court's claim construction.

Id. at 1344-5. Obviously, the court in *Nazomi* paid close attention to the precise language of the claims in rendering its decision.

In *Silicon Graphics*, cited by *Nazomi*, the court considered infringement of a “computer system” comprising “a rasterization circuit coupled to the processor that rasterizes” and “a frame buffer coupled to the rasterization circuit for storing [data]” by an accused graphics chip that admittedly “cannot rasterize or store absent an operating system . . .” 607 F.3d at 795. The court held, “[n]othing in the record suggests that the Microsoft Windows operating system provides anything other than a way to activate the accused product. Because infringement of the claims at issue does not turn on activation, this court vacates the summary judgment ruling of noninfringement . . .” *Id.*

Against this backdrop, it is more reasonable to construe “a magnetic stripe emulator operable to communicate an analog waveform encoded with at least one track of magnetic stripe data” (153 patent at cl. 1) as a combination of hardware and software, rather than just hardware that is capable or programmable to perform the recited function. Most pertinent is the recitation

of “magnetic stripe data” in the claim. As determined above, this is not an amorphous data set but standardized in size and identity. This format is achievable only through software—software that does more than simply activate the “magnetic stripe emulator” hardware (*i.e.*, amplifier and antenna).

The language “wherein said device is operable to retrieve said digital representation from a plurality of digital representations” (153 patent at cl. 1) presents an even clearer case. No specific hardware is recited at all (“said device”), only the function of retrieving a digital representation from memory. This is the province of software; and not any generalized software that simply activates “said device,” but software that purposely stores and retrieves different representations of known, standardized data, for a particular purpose (*e.g.*, responding to different environmental conditions).

Thus, these limitations align with those at issue in *Nazomi*—reciting hardware that not only could be programmed to perform an action, but is so programmed. To do otherwise would vitiate the “track of magnetic stripe data” and “plurality of digital representations” aspects of the invention. Accordingly, “operable to” in the 153 patent claim limitations discussed above is construed to require a hardware-software combination that must perform the described functions.

D. Infringement

According to Dynamics’ post-hearing briefing, the use, manufacture, or sale of all Accused Products are alleged to infringe asserted claims 1 and 7 of the 153 patent. CIB at 28. Of these, claim 1 is independent and claim 7 is dependent thereon. For the reasons discussed below, Dynamics has shown infringement of claims 1 and 7 by certain products.

There are a few preliminary points to discuss, however, applicable to all infringement theories based on MST. First is Samsung’s argument that the Accused Products actually require

[REDACTED]

“modification by the end user to enable the accused MST functionality.” RIB at 22-23. Specifically, Samsung refers to a need for a user to install the Samsung Pay application on the device (on some products), and the need to register a card within the application (for all devices) before there could possibly be infringement. *See id.* at 23 (citing RX-1675C at Q/A 36-38, 367-370); RRB at 10-11 (citing, *inter alia*, RX-1684C at Q/A 31-32, 35, 44-46, 49, 69-70). This, according to Samsung, means its devices “as imported and sold by Samsung do not directly infringe any of the Asserted Patents,” necessitating an indirect infringement theory from Dynamics. *Id.* Samsung notes that Dynamics “did not dispute this in its Pre-Hearing Brief, and has therefore waived it” (*id.* (citing G.R. 9.2)), and as to indirect infringement, never briefed such a theory (*see* RIB at 24 (citations omitted); RRB at 10-11).

In response, Dynamics argues “[t]he installation of Samsung Pay is not a requirement for a finding of infringement.” CRB at 7. Dynamics contends “the asserted claims are device claims that recite capability,” and thus, if a product “could be programmed to perform the claimed functionality,” then it infringes. *Id.* (citing *Nazomi*, 739 F.3d at 1344; *Silicon Graphics*, 607 F.3d at 794; *Finjan*, 626 F.3d at 1204). Dynamics continues:

Samsung’s claim that “Dynamics did not dispute this in its Pre-Hearing Brief, and has therefore waived it,” is unreasonable. Dynamics does not accuse Samsung Pay of being the infringing product, or dispute whether Samsung Pay is installed in a particular phone. Dynamics merely points out, as outlined in its Pre-Hearing and Initial Briefs, that the evidence shows that Samsung’s Accused Devices still contain the necessary hardware and source code that meet the claim limitations of the Asserted Patents at the time of importation. Dynamics’ PHB at 22-27; *see also, e.g.*, CX-1199C (Zatkovich) at Q/A 84-88, 96-106. Samsung Pay is the application that takes the most advantage of these functionalities. Complainants’ PHB at 22-27. Indeed, as Mr. Prasad indicated, [REDACTED]

[REDACTED] *See* RX-1684C (Prasad) at Q/A 50-51. The infringing products are the phones and wearable devices, particularly because they include the necessary components that are operable to perform MST (and “tap to pay”) transactions. Dynamics’ PHB at 22-27; CX-1199C (Zatkovich) at 84-88, 96-106, 115-123, 133-140.

[REDACTED]

Id. at 8. Dynamics did not, in fact, advance this argument in its pre-hearing brief, and has therefore waived it under G.R. 9.2. *See generally* CPB at 31-42, 69-80, 107-110, 133-137.

As determined above, a device cannot infringe “operable to communicate an analog waveform encoded with at least one track of magnetic stripe data” and “operable to retrieve said digital representation from a plurality of digital representations” as in claim 1 without the necessary software. Dynamics does not dispute the understanding of Samsung’s expert, Dr. Apsel, that the Galaxy A50, Galaxy Note10, and Galaxy Note10+ accused products “do not have the Samsung pay application installed when imported and sold, only a stub app.” RX-1675C at Q/A 368; *see* CX-1199C at Q/A 29; CIB at 29; CRB at 7-8.

The evidence shows the “stub app” on these devices does not provide the required functionality. Dynamics’ expert, Mr. Zatkovich, opined “the only purpose of the Samsung Pay ‘stub’ application was to install the full version of the Samsung Pay application.” CX-1199C at Q/A 29. That is effectively an admission the required software is not present. Thus, the Galaxy A50, Galaxy Note10, and Galaxy Note10+ accused products do not directly infringe the 153 patent.

As to those remaining Accused Products which are imported with Samsung Pay, Samsung’s argument that registration of credit card information is a “modification” preventing infringement (RIB at 22-23; RX-1675C at Q/A 367-370) is not persuasive. Entry of these values is more akin to the unlocking of existing, fully-functional, software with a product key—which the Federal Circuit has determined is not a modification. *See Nazomi*, 739 F.3d at 1346 (citing *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1205 (Fed. Cir. 2010)). Thus, these products are not barred from infringing claim 1 of the 153 patent due to lack of a registered credit card number.

[REDACTED]

An additional preliminary issue exists regarding the Hardware-Modified Products and the Software-Modified Products. As discussed above, Samsung has adequately placed them into the investigation for an infringement determination.

As to the Hardware-Modified Products, Samsung argues the parties' experts agree they do not infringe any asserted patent, including the 153 patent, because of the removal of a switch necessary for MST to operate. RIB at 36 (citing Hr'g Tr. at 274:13-276:9; RX-1675C at Q/A 374). Samsung adds that Dynamics "admitted during fact discovery that the Hardware-Modified Products produced during discovery do not infringe any Asserted Patent." *Id.* (citing RX-0051C at RFA Nos. 116-119, 124-127). Dynamics does not even argue that the Hardware-Modified Products infringe. *See* CIB at 108-109; CRB at 18-19. Accordingly, the Hardware-Modified Products do not infringe the 153 patent. *See* RX-0051C at *3, 11.

As to the Software-Modified Products, Dynamics argues, "[a] product may infringe a patent if it 'could be programmed to perform the claimed functionality.'" CIB at 108 (citing *Nazomi*, 739 F.3d at 1344; *Intel*, 946 F.2d at 832; *Silicon Graphics*, 607 F.3d at 794)); CRB at 18-19. According to Dynamics, "Samsung's Software-Redesigned Products infringe because they contain all of the hardware components necessary to perform MST and can be upgraded to do so through a routine software update." CIB at 108 (citing CX-1199C at Q/A 143); CRB at 18. Dynamics notes that the ease of updating firmware is shown in Samsung user manuals (CIB at 108 (citing CX-0160 at *255; CX-0161 at *278; CX-0162 at *242; CX-0163 at *247; CX-0164 at *238)), directly contradicting testimony from Samsung's expert at the hearing (*id.* (citing Hr'g Tr. at 579:15-24)). Dynamics argues that full MST functionality can also be restored "by simply uploading the current source code present in all of Samsung's MST-enabled phones currently on the market." *Id.* at 109 (citing CX-1209C at 131:10-22).



Samsung contends that Dynamics’ expert, Mr. Zatkovich, admits the Software-Modified Products also do not infringe “any of Dynamics patents,” taking the same position of its own expert, Dr. Apsel. RIB at 37 (citing Hr’g Tr. at 278:13-278:18; RX-1675C at Q/A 378). Samsung explains the software change removes the code “that is necessary to power on MST hardware.” *Id.* (citing Hr’g Tr. at 472:8-24; RX-1672C at Q/A 20-83; CX-1209C at 133:19-134:14). Samsung describes Dynamics’ argument that the “binaries of these phones could be modified to add the code [back]” as “legally irrelevant and contrary to the evidence in this case.” *Id.* at 37-38 (citing, *inter alia*, *Nazomi*, 739 F.3d at 1345-6; *High Tech*, 49 F.3d at 1555); RRB at 64. In addressing *Silicon Graphics*, cited by Dynamics, Samsung argues there is nothing present in the underlying software of the Software-Modified Devices that could be activated to restore MST functionality—*i.e.*, a true modification is needed. *See* RRB at 65.

Dynamics has not met its burden. As determined in the claim construction discussion of “operable to,” the particular language chosen for the asserted claims of the 153 patent requires a hardware-software combination that performs the recited functions. As they stand, the Software-Modified Devices are unable to power up the MST IC, thereby thwarting the delivery of current to the MST coil. RX-1672C at Q/A 21, 43, 64-65. Hence, they are incapable, among other things, of communicating track data to a magnetic stripe reader. To the extent Dynamics argues the ease of re-installing the necessary software to power the MST IC somehow preserves infringement (*see* CIB at 108-109), it has not provided the legal basis for such a determination.

Accordingly, the Software-Modified Devices do not infringe the 153 patent.

1. Claim 1

For reference, claim 1 of the 153 patent requires:

1. A device comprising:

[REDACTED]

a magnetic stripe emulator operable to communicate an analog waveform encoded with at least one track of magnetic stripe data to a magnetic stripe reader; and

a waveform generator operable to generate said analog waveform from a digital representation of said at least one track of magnetic stripe data,

wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data.

153 patent at cl. 1. There are two disputes between the parties as to whether the Accused Products meet the limitations of this claim—disputes over generating an “analog waveform” and “plurality of digital representations.” These are discussed below. For those remaining limitations which are not in dispute, the Accused Products have been shown to meet them in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 86, 87; CIB at 29-31.

As noted, a real-world square wave falls within the scope of “analog waveform.” Samsung disputes this, to the extent it is a question of claim construction, but does not dispute that the Accused Products generate a real-world square wave. *See* RIB at 25. Samsung’s technical documentation shows [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

RX-0121C at *9. In other words, the Accused Products operate in essentially the same way as one of the embodiments disclosed in the 153 patent. *See* 153 patent at 12:59-67.

This finding is troubling. The parties' dispute over "analog waveform" in the infringement context is straightforward to resolve, notwithstanding Dynamics' lack of argument on the point, because it is undisputed that the Accused Products employ a square wave. In fact, Samsung touts the evidence that they employ a square wave. *E.g.*, RIB at 25. It stands to reason, however, that Samsung would not have taken such a position had the parties raised "analog waveform" as a disputed claim in the *Markman* process. Regardless, "a waveform generator operable to generate said analog waveform" has been shown in the Accused Products.

As to whether the Accused Products "retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data," Dynamics argues certain [REDACTED] of data communicated by MST [REDACTED]

[REDACTED]

[REDACTED] CIB at 31-32 (citing, *inter alia*, RX-1674C at Q/A 24, 28, 36-38). Dynamics contends [REDACTED] (*id.* at 32 (citing, *inter alia*, RX-1675C at Q/A 330, 347-348; RX-1486; CX-1199C at Q/A 73-74, 88); *see* CRB at 11-12 (citing, *inter alia*, RX-1674C at Q/A 24; Hr’g Tr. at 497:7-498:18, 505:13-506:1; RX-1673[C] at Q/A 7)) and that [REDACTED] (CRB at 11 (citing RX-1673[C] at Q/A 35-36; RX-1674C at Q/A 43-50)).

Samsung argues three points in opposition, all of which focus primarily on the scope of the claims rather than the features of the Accused Products. The first is that the [REDACTED]

[REDACTED]

[REDACTED] RIB at 30 (citing, *inter alia*, RX-1675C at Q/A 335; RX-1674C at Q/A 16, 33-42) (emphasis in original); RRB at 13. Samsung contends this is “much different from what is disclosed and claimed in the ’153 patent” because, in part, of a Dynamics’ interrogatory response on invalidity. RIB at 31. Samsung states, “in an attempt to distinguish prior art,” Dynamics argued that tracks constructed at the time of transmission are outside the scope of the ’153 patent, stating that “[t]he ad hoc generation of data, rather than its retrieval from memory, is problematic as it requires substantially greater processing power, as opposed to the ’153 Patent, which merely requires sufficient memory to store the digital representations from which they may be retrieved.” RIB at 31 (citing RX-0607C at *8-11; RX-1675C at Q/A 331); RRB at 14. Continuing, Samsung explains, [REDACTED]

[REDACTED]

[REDACTED] *Id.* at 32 (citing RX-1675C at Q/A 347; RX-1673C at Q/A 34-36; RX-1627C at *48-54; RPX-0018C); RRB at 14. Again, according to Samsung, this is markedly different from the 153 patent, [REDACTED]

[REDACTED]

[REDACTED] RIB at 32 (citing RX-1675C at Q/A 330; 153 patent at 3:41-45, 8:28-31, 11:53-58, Fig. 2); RRB at 14 (alleging patent’s focus on [REDACTED])

The second point is that the characteristics which allegedly demarcate the two “representations”—the number of leading zeros, trailing zeros, ordering, and delay—are actually not part of track data and thus do not result in “a plurality of digital representations of said at least one track of magnetic stripe data.” See RIB at 33 (citing, *inter alia*, CX-1199C at Q/A 88); RRB at 15. Samsung, through Dr. Apsel, contends this is specified in the ISO standards governing magnetic stripe transactions. See RIB at 33 (citing RX-1675C at Q/A 341; RX-0321 at *8; RX-0582C at *25; RX-0583C at *16-17; RX-0584C at *47; RX-0585C at *28-29; RX-1627C at *1). Samsung adds, through the testimony of software expert Dr. Goldberg, that [REDACTED]

[REDACTED]

Id. (citing, *inter alia*, RX-1674C at Q/A 28, 39).

Samsung’s third point is that there is no retrieval of one of the alleged digital representations from the plurality of digital representations. RIB at 33-34. Specifically, Samsung argues, through Dr. Goldberg, [REDACTED]

[REDACTED]

[REDACTED] *Id.* at 34 (citing RX-1674C at Q/A 44-45; Hr’g Tr. at 625:5-24). Rather, according to Samsung, [REDACTED] *Id.* (citing, *inter alia*, RX-1684C at Q/A 45-50; RX-1627C at *61-63, 56-58). In reply, Samsung argues the Accused Products also cannot [REDACTED] which is important because

[REDACTED] RRB at 15.

[REDACTED]

The record supports finding the limitation met in the Accused Products. Samsung's argument that the [REDACTED] is not a "memory" under the claim depends on an overly narrow reading of "memory" that excludes values which are [REDACTED]. See RIB at 32. There is no support in the intrinsic evidence for this restriction. While Samsung argues that in the 153 patent "the disclosed memory is persistent hardware storage," that is not enough to limit the broad term "memory" to this embodiment (*GE Lighting Solns., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (holding it is improper to read in limitations from preferred embodiments, or even only embodiments, absent a clear indication the patentee intended to the claims to be so limited)). And "persistent" or other similar descriptor is not found in Samsung's cited excerpts (RIB at 32 (citing 153 patent at 3:41-45 (only mentions "memory"), 8:28-31 (mentions "memory" and a "write pointer"), 11:53-58 (only mentions "memory"), Fig. 2); RRB at 14 (citing 153 patent at 3:27-40 (only mentions "memory"))). Rather, the Accused Products'

[REDACTED]

[REDACTED] puts them within the claim. If there is a difference between this operation and the 153 patent, as argued by Samsung, it is that the memory is not accessed in response to any kind of sensed condition. See, e.g., 153 patent at 11:53-67 (responsive to temperature), 12:1-12 (responsive to type of card reader), 9:36-51 (responsive to direction of swipe). But this functionality is the subject of other, non-asserted, dependent claims, showing that it is not a requirement of claims 1 or 7. See, e.g., *id.* at cls. 2, 3, 4.

Samsung's argument regarding "plurality of digital representations of said at least one track of magnetic stripe data" also depends on an overly narrow, and generally unexplained, reading of "representation." While the [REDACTED] [REDACTED] (see CX-1199C at Q/A 39, 88) may not technically be part of a "track of magnetic stripe

[REDACTED]

data” as construed above (*see, e.g.*, RX-0321 at *8), Samsung does not explain why the [REDACTED] is not a “digital representation” of a “track of magnetic stripe data” (*see* RIB at 33; RRB at 13-15). The patent appears to employ this flexibility, describing “magnetic stripe message[s]” which contain “one, two, and/or three tracks of magnetic stripe information” as “a series of digital symbols” that “digitally approximate a waveform.” 153 patent at 10:30-48. The patent continues, “[i]n step 404, one or more of many digital waveforms may be retrieved from memory as an array of symbols that *represent* a waveform encoded with a magnetic stripe message containing one, two, and/or three tracks of magnetic stripe data. Such a magnetic stripe message may include, for example, account and account holder information associated with the payment account feature as selected by the cardholder in step 402.” *Id.* at 12:46-58 (emphasis added). The patent also envisions two stored digital waveform representations as containing the same “account information” but differing through “different characteristics that may be useful depending upon an environment that the card may be operating within.” *See id.* at 13:26-39. Thus, there is support for finding [REDACTED] as a “digital representation” of a “track of magnetic stripe data.” That there are [REDACTED] (CX-1199C at Q/A 39, 88), satisfies “a plurality of digital representations.”

As to Samsung’s argument that there is no “retriev[al]” of one of the plurality of representations, this appears to depend on reading the limitation as “operable to retrieve [just one] digital representation from a plurality of digital representations.” *See* RIB at 33; RX-1675C at Q/A 348 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Samsung provides no support for

[REDACTED]

this restriction, and it is otherwise improper. The plain language simply requires the retrieval of a representation from among a plurality. Nothing precludes subsequent, automatic, retrieval of another representation, [REDACTED] *See* RX-1675C at Q/A 348; RX-1673C at Q/A 25; CX-1199C at Q/A 88; RX-1674C at Q/A 26-27. It is also worth noting that the claim does not restrict which component (*e.g.*, MST driver, MST IC, MFC IC, etc.) performs the “retriev[al],” referring only to the overall “device” as “operable to” do so. 153 patent at cl. 1.

Accordingly, the Accused Products meet the limitation “wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data” along with “analog waveform.” Thus, they (not including the Galaxy A50, Galaxy Note10, and Galaxy Note10+) have been shown to infringe claim 1 of the 153 patent.

2. Claim 7

For reference, claim 7 of the 153 patent requires:

7. The device of claim 1, wherein said analog waveform is encoded with two tracks of magnetic stripe data.

153 patent at cl. 7. For this claim, Dynamics argues [REDACTED]

[REDACTED]

[REDACTED] CIB at 32 (citing CX-1199C at Q/A 89).

The additional limitation of claim 7 is met in the Accused Products. The waveform created by the MST driver, [REDACTED] contains two tracks of magnetic stripe data [REDACTED]

[REDACTED] *See* RX-1674C at Q/A 24; RDX-2002C; RX-1627C at *1.

[REDACTED]

In opposition, Samsung asserts that the waveform must be the same between claim 1 and claim 7, but that the waveform relied on for claim 1 [REDACTED] RIB at 35 (citing, *inter alia*, CX-1199C at Q/A 88); RRB at 16. This is not persuasive. First, and contrary to Samsung’s suggestion, Dynamics does not define the exact bounds of the allegedly infringing “waveform” in the discussion of claim 1 (*see* CX-1199C at Q/A 85-88), and, in claim 7, those bounds are impliedly assigned to [REDACTED] which by definition would cover two tracks (*id.* at Q/A 89 ([REDACTED] ”)).

Second, and in the alternative, Samsung argues treating the transmission of [REDACTED] as one waveform conflicts with the “plurality of digital representations” limitation in claim 1 “because [REDACTED] . . . would be part of the same single representation.” RIB at 35. This too is not persuasive. The only way to understand the [REDACTED] as being two parts of a single representation is to assume “waveform generator operable to generate said analog waveform from a digital representation of said at least one track of magnetic stripe data” means the waveform is generated *exclusively* from one digital representation (*i.e.*, [REDACTED]). *See* RRB at 16 (“the waveform of claim 1 that is generated from *one* of the plurality of digital representations”) There is no reason to read this limitation into the claims, especially given the patent’s discussion of portions of a waveform stored within memory, retrieved, and concatenated for a single waveform. 153 patent at 2:23-33.

Accordingly, the Accused Products (not including the Galaxy A50, Galaxy Note10, and Galaxy Note10+) infringe claim 7 of the 153 patent.

[REDACTED]

E. Domestic Industry – Technical Prong

According to Dynamics’ post-hearing briefing, only three DI Products practice claims 1 and 7 of the 153 patent—IndusInd, SMCC, and Emirates NBD devices. *See* CIB at 32-36. Dynamics has not shown by a preponderance of the evidence that these DI Products practice either claim.

As for the Emirates NBD device, it is undisputed that Dynamics has been developing, manufacturing, and selling magnetic emulation payment cards for many years, but the Emirates NBD device is still only in development. *See, e.g.*, Hr’g Tr. at 33:15-35:3, 37:4-9, 61:24-62:8; CX-1197C at Q/A 56-85 (describing development); CIB at 140 (stating “entire Connected Wallet Card design was close to completion at the time Mr. Workley was deposed”). While Dynamics makes certain claims about “various schematics and prototypes that existed prior to the filing of the Complaint” (CIB at 33) and “[REDACTED], Dynamics had finalized a prototype of the Emirates NBD device” (CRB at 56), it is undisputed that only one device was ever produced or made available for inspection as part of this investigation—an “[REDACTED]” prototype demonstrated between counsel on October 17, 2019 (*see* RIB at 121-122; CIB at 33-34; CRB at 58-60; CX-0656C); CPX-0014. This prototype, however, was created earlier that month—*i.e.*, after the July 12, 2019 filing of the complaint. Hr’g Tr. at 61:24-63:3.

This is a fatal problem because domestic industry is to be assessed as of the filing of the complaint absent “very specific circumstances, *i.e.*, ‘when a significant and unusual development has occurred after the complaint has been filed.’” *Certain Thermoplastic-Encapsulated Electric Motors, Components Thereof, and Products and Vehicles Containing Same II*, Inv. No. 337-TA-1073, Comm’n Op. at 7 (Aug. 12, 2019) (“*Thermoplastic Motors*”) (citing *Certain Collapsible Sockets for Mobile Electronic Devices and Components Thereof*, Inv. No. 337-TA-1056, Comm’n

Op. at 15 n.10 (July 9, 2018)). Dynamics makes no argument that “significant and unusual developments” have occurred here, however. *See generally* CIB; CRB.

Thus, the time period for evaluating whether a domestic industry “exists” under the 153 patent begins July 12, 2019, and the October 17, 2019-demonstrated prototype is not available for consideration. As explained by the Commission:

Both Federal Circuit law and Commission precedent require the existence of actual “articles protected by the patent” in order to find that a domestic industry exists. In *Microsoft Corp. v. International Trade Commission*, the Federal Circuit held:

Section 337, though not requiring that an article protected by the patent be produced in the United States, unmistakably requires that the domestic company’s substantial investments relate to actual “articles protected by the patent.” 19 U.S.C. § 1337(a)(2), (3). A company seeking section 337 protection must therefore provide evidence that its substantial domestic investment—*e.g.*, in research and development—relates to *an actual article that practices the patent*, regardless of whether or not that article is manufactured domestically or abroad. *InterDigital Commc’ns v. Int’l Trade Comm’n*, 707 F.3d 1295, 1299, 1304 (Fed. Cir. 2013).

731 F.3d 1354, 1361-62 (Fed. Cir. 2013) (emphasis added). In view of both *Microsoft* and *InterDigital* (cited in the block quotation above), the Commission has held that “a complainant alleging the existence of a domestic industry under 19 U.S.C. § 1337(a)(3)(C) must show the existence of articles.” *Certain Computers and Computer Peripheral Devices, and Components Thereof, and Products Containing Same* (“*Certain Computers and Computer Peripheral Devices*”), Inv. No. 337-TA-841, Comm’n Op. at 40 (Jan. 9, 2014). Thus, to demonstrate that a domestic industry exists, the “existence of articles” requires a physical embodiment of the patented invention. We have clarified that this articles requirement is not “limited to commercial goods.” *Certain Non-Volatile Memory Devices and Products Containing the Same*, Inv. No. 337-TA-1046, Comm’n Op. [at] 41 (Oct. 26, 2018) (public version).

Thermoplastic Motors, Inv. No. 337-TA-1073, Comm’n Op. at 9; *id.* at 10 (“Without the existence of an article protected by the patent, *i.e.*, a physical embodiment of the patented invention, the Commission finds that IV cannot establish that a domestic industry ‘exists’ relating to the articles protected by the patent.”). It does not matter, as Dynamics argues, that the “design,” technical drawings, or bills of materials may otherwise have been “final” by the complaint date. CIB at 33

[REDACTED]

(stating [REDACTED]
[REDACTED]), 34 (stating [REDACTED]), 140 (stating design “was close to complete” as of July 12, 2019), 140-141 (stating bill of materials that “will be used to produce” the device is ready). The Commission encountered essentially the same argument in *Thermoplastic Motors* and rejected it. Inv. No. 337-TA-1073, Comm’n Op. at 10 n.13 (clarifying CAD drawings are not “articles”), 8 n. 11 (explaining why domestic industry analysis cannot be a moving target).

Accordingly, and apart from the discussion below, Dynamics has not shown an actual Emirates NBD article in existence at the time of the complaint to support a domestic industry that “exists.” Moreover, there is no indication Dynamics contends an industry for the 153 patent is otherwise “in the process of being established.” *See generally* CIB; CRB.

1. Claim 1

Claim 1 of the 153 patent is presented above in connection with infringement. The primary dispute between the parties is whether the relevant DI Products generate and communicate an “analog waveform” as claimed. This is discussed below. For those remaining limitations which are not in dispute, the DI Products have been shown to practice them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 80-82; CIB at 34-35.

As to communicating an “analog waveform,” Dynamics argues the three devices include a coil assembly, part of Dynamics’ “programmable magnetics’ payment technology.” CIB at 34-35 (citing, *inter alia*, CX-1199C at Q/A 80; CX-0156; CX-0157; CX-0158). As to generating an “analog waveform,” Dynamics refers to an [REDACTED] in a bill of materials which “communicates an analog waveform [REDACTED].” *Id.* (citing Hr’g Tr. at 54:12-17; CX-1198C at Q/A 64-66). Dynamics argues, much as it did with infringement, that “[b]ecause the waveform conveys information via varying frequencies in accordance with the F2F encoding

[REDACTED]

format, the waveform is an analog waveform.” *Id.* (citing Hr’g Tr. at 55:24-56:4, 79:11-80:25); CRB at 19.

In opposition, Samsung contends Dynamics “offers no evidence of what the output of the [REDACTED] actually looks like” such that “there is no way to determine whether the coil drive [REDACTED] in the DI Products actually produces an analog waveform as required by the ‘waveform generator’ limitation of the claim.” RIB at 44 (CX-1199C at Q/A 80-81; RX-1675C at Q/A 358). Samsung also notes, as with infringement, that Dynamics has only argued the waveform is “analog” under Dynamics’ construction—such that, if the construction is not adopted, Dynamics has failed to carry its burden. RRB at 16.

And the construction is not adopted, as explained above. Dynamics offers no theory for why any waveforms generated and communicated in the DI Products are “analog” apart from its erroneous construction involving frequency encoding. With that construction rejected, there is no theory left to evaluate, and Dynamics cannot meet its burden.

This finding, too, is troubling. In contrast to infringement, where the record was clear and undisputed, for domestic industry technical prong Dynamics offers only evidence consistent with its erroneous claim construction proposal. *See* CIB at 34-35; CRB at 19. It points to no evidence in its post-hearing briefs regarding the shape of any alleged waveforms. And as Dr. Apsel observes, “Mr. Zatkovich does not cite any evidence of what the waveform in the alleged DI products looks like.” RX-1657C at Q/A 358.

What makes this troubling is that, according to some record evidence, Dynamics’ products

[REDACTED] in virtually the same way the Accused Products do:

[REDACTED]

[REDACTED]

CX-0155C at *25-26. As seemingly shown in the figure and its accompanying explanation, a

[REDACTED], which is then transmitted to the coil, with the [REDACTED]
[REDACTED] as the reader head output. *See id.* The author of the document in which this figure and
explanation appear, Mr. Workley, testified at his deposition that the “[REDACTED]
[REDACTED]” and further agreed that
the wave-shaping circuit “[REDACTED]” RX-0042C at
32:4-21. More context is needed to fully understand this evidence, but there is at least some reason
to believe that the DI Products use a [REDACTED] wave as an input to the emulator coil,
which, if true, would appear to satisfy the “analog waveform” limitation.

[REDACTED]

So it may well be that domestic industry technical prong could have been proven, had Dynamics simply presented its case differently. There are any number of possible reasons why Dynamics did not do so, but it is concerning that one such reason may have derived from the parties' failure to raise the interpretation of "analog waveform" at the *Markman* stage. Had they done so, the term likely could have been construed, and the parties' arguments could have been tailored to that construction. But that did not happen, and for whatever reason Dynamics chose not to make out a technical prong case based alternatively on Samsung's proposed interpretation of "analog waveform." As a result, I am compelled to find facts that may not be consistent with the record.

In any event, Dynamics has not proven the limitation is present in the three DI Products, and claim 1 is not practiced.

Notwithstanding the above, the Emirates NBD device has not been shown to practice claim 1 for an additional reason. As determined above, "operable to" in claim 1 requires the recited functions to take place in a hardware-software combination. The evidence shows the only embodiment of the Emirates NBD device made available to Samsung as part of this investigation—the card demonstrated on October 17, 2019—[REDACTED]
[REDACTED] *See, e.g.*, RRB at 59 (citations omitted); CRB at 53-60; CIB at 33-34 (implicitly admitting [REDACTED] CX-1199C at Q/A 127, 129. Thus, there can be no practice of the claim by this device.

2. Claim 7

Claim 7 of the 153 patent is presented above in connection with infringement. The dispute between the parties is whether the "analog waveform" of claim 1 is "encoded with two tracks of magnetic stripe data" as claimed. Dynamics argues succinctly, "[t]he two coils that form the coil assemblies in the IndusInd, SMCC (which includes three tracks), and Emirates NBD devices may

[REDACTED]

be considered, collectively, to communicate an analog waveform, which would include at least two tracks—one from each coil.” CIB at 26 (citing CX-1199C at Q/A 83). Samsung, by contrast, argues “Mr. Zatkovich never explains why these two tracks can be considered part of a single waveform and, in fact, they are not,” and contends that each coil outputs its own track in separate waveforms. *See* RIB at 44 (citing, *inter alia*, RX-0042C at 206:17-207:9; RX-1675C at Q/A 364); RRB at 16-17.

Samsung has the more persuasive position. Dynamics provides no explanation for why two separate emissions from two separate coils would be considered a single waveform, as required by the claim. CIB at 16; CX-1199C at Q/A 83. Given that these signals are “overlap[ping],” or occurring at the same time (Hr’g Tr. at 316:18-22; RX-1675C at Q/A 238), the more natural interpretation is they are not one waveform, but two.

Accordingly, practice of claim 7 has not been shown.

F. Validity

Samsung identifies the following invalidity and unenforceability theories for the 153 patent:

Claims	Theory
1, 7	Rendered obvious under 35 U.S.C. § 103 by Gutman (RX-0877) and Shoemaker (RX-0884)

See generally RIB at 45-57. Of the prior art listed above, Samsung argues U.S. Patent No. 6,206,293 (“Gutman”) is prior art to the 153 patent, a point not disputed by Dynamics. RIB at 46 n.6. As Samsung’s expert, Mr. Lipoff, explains, “Gutman issued on March 27, 2001, from an application filed on December 1, 1997, and is prior art under 35 U.S.C. sections 102(a), (b), and (e).” RX-1677C at Q/A 98; *see* RX-0877.

[REDACTED]

Samsung argues U.S. Patent No. 7,690,580 (“Shoemaker”) is also prior art to the 153 patent, again not disputed by Dynamics. RIB at 46 n.6. As Mr. Lipoff explains, “Shoemaker issued on April 6, 2010, from an application filed on November 17, 2006, and is prior art under 35 U.S.C. sections 102(a), (b), and (e).” RX-1677C at Q/A 103; *see* RX-0884. Therefore, both Gutman and Shoemaker qualify as prior art to the 153 patent.

As for the scope and content of the prior art, Samsung argues Gutman discloses all limitations in claim 1 except for “multiple representations of the same track data.” RIB at 45; RRB at 17. Samsung contends Shoemaker “discloses use of forward and reverse representations of tracks,” however, and further contends it would have been obvious to combine the two. RIB at 45-46 (citing RX-0884 at 14:65-15:6; RX-1677C at Q/A 484).

As to that combination, Samsung argues Shoemaker discloses “‘swipe sensors’ to determine whether the card has been swiped in a forward or reverse direction and that, based on the detected swipe direction, the data will be output in the forward or reverse order.” *Id.* at 49 (citing RX-0884 at 12:28-43, 14:54-15:6). Samsung’s expert testified, according to Samsung, that “it would have been obvious to a POSITA to implement the forward and reverse transmission described by Shoemaker by storing both the data in both forward and reverse directions, and then retrieving the proper representation based on the detected swipe direction.” *Id.* (citing RX-1677C at Q/A 458-459, 484-486); RRB at 18. As to whether this would benefit Gutman, Samsung refers to Gutman’s disclosure that its “‘invention may still be ‘swiped’ through a magnetic card reader’” and would be helpful in those card readers that “only process magnetic stripe track data if it is presented in the order that the card reader expects (forward or reverse, but not both).” RIB at 49 (citing RX-0877 at 16:4-17:3; RX-1677C at Q/A 459, 486; CX-1197C at Q/A 49-50). Samsung adds, “storing the forward and reverse representations in Gutman’s device would require less

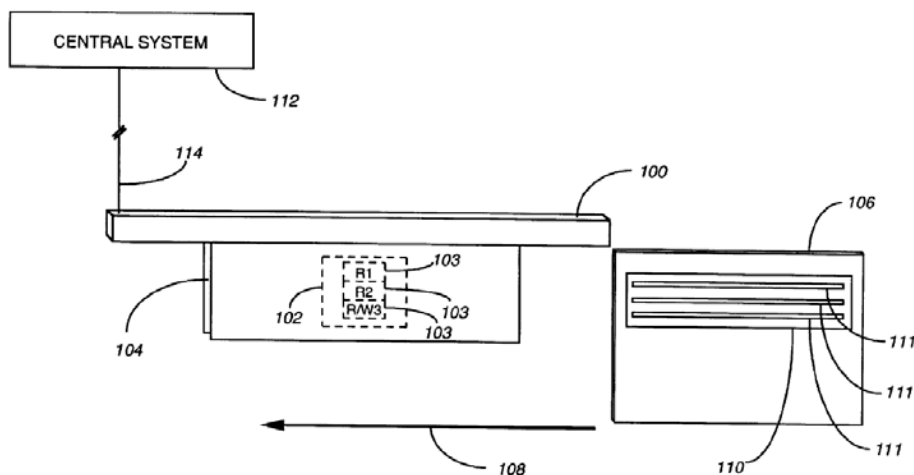
[REDACTED]

processing time and power than reversing the data at the time of the transaction, and is one of ‘a finite number of identified, predictable solutions’ that would have been obvious to try.” RIB at 50 (citing RX-1677C at Q/A 458-459, 486; *KSR*, 550 U.S. at 421); RRB at 18, 20 (“Gutman stores tracks relating to different accounts, so storing another track in the reverse direction does not add any additional complexity.”).

Samsung’s proposed combination is not persuasive, particularly in view of the differences between the claimed invention and the prior art. *See Scanner Techs. Corp.*, 528 F.3d at 1379. First, invalidity must be shown by clear and convincing evidence (*Microsoft*, 564 U.S. at 95), but it is not clear that Gutman would benefit from swipe sensors that trigger packaging or preparing track data in forward and reverse directions (*i.e.*, the imported feature of Shoemaker). Gutman discloses its invention as functioning independent of the swiping motion of traditional payments cards:

Therefore, by electronically changing the magnetic fields about a conductor of the conductor 204 in a time variable manner, information is communicated to a magnetic card reader such as the prior art magnetic card reader 100. Since the magnetic fields change electronically, movement of the card of the present invention is not required, thereby saving wear and tear on both the card and the card reader. Nevertheless, since the conductor 204, in the preferred embodiment, runs substantially the width 201 of the card, the card of the present invention may still be “swiped” through a magnetic card reader. This allows users to perform the familiar “swiping” movement while using the card 200 of the present invention for users that have become accustomed to the “swiping” movement of the card 106. However, no “swiping” movement is necessary. Additionally, since the conductor 204 runs substantially the width of the card, the placement of the card along the “swipe” direction in the magnetic card reader is not critical for operation with the magnetic card reader 100 as long as a portion of the length of the card is inserted in the slotted portion 104 of the magnetic card reader 100. Consequently, communication of data by the card of the current invention is independent of movement of the card or placement of the card within the magnetic card reader. Further, the long track also provides for the present invention to work with magnetic card readers which have electromechanical mechanisms which automatically move the card through the magnetic card reader.

RX-0877 at 16:57-17:16. This is shown in the figures, where Gutman’s emulator is inserted into a card reader slot perpendicular to the traditional (*i.e.*, prior art) swiping axis:



Prior Art
FIG. 1

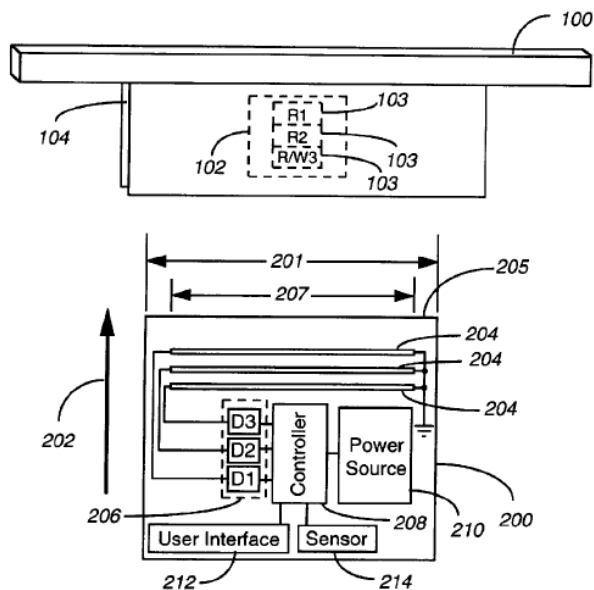


FIG. 2

Compare RX-0877 at Fig. 1 with *id.* at Fig. 2; see Figs. 4, 5. Thus, while Gutman’s invention “may still be ‘swiped,’” the disclosure is clear—“no ‘swiping’ movement is necessary” because “communication of data by the card of the current invention is independent of movement of the

[REDACTED]

card or placement of the card within the magnetic card reader.” *Id.* at 16:64-17:13. While Samsung argues, “[a]s Mr. Lipoff explains, Gutman’s tracks are formatted only in a single direction, and will not work in readers that expect tracks in the opposite direction” (RRB at 18), it provides no cite to that supposed testimony (*see generally* RX-1677C at Q/A 470-489), and the point is otherwise not persuasive, given Gutman’s explicit independence from any kind of swiping motion.

Second, even if Gutman were in some way to benefit from Shoemaker’s ability to detect swiping direction, Samsung admits that Shoemaker does not disclose storing forward and reverse track data representations in memory. RRB at 18 (“Shoemaker creates its forward and reverse tracks on the fly—it does not store them.”). Samsung instead contends that such memory storage (as opposed to on-the-fly creation) would have further been obvious to one of ordinary skill in the art. RIB at 50 (citing RX-1677C at 458-459, 486).

Mr. Lipoff’s explanation is insufficient for a clear and convincing case. He testifies (in relation to separate prior art), “[a] POSITA would also have recognized that storing these representations in the device would allow the device to more quickly respond to the swipe and require less processing power than reversing a single stored representation on the fly.” RX-1677C at Q/A 459; *see id.* at Q/A 485-487. But he points to no disclosure in the prior art (invalidating reference or other text) to support these claims of improved response time and power use, and no explanation for why they occur. Moreover, Mr. Lipoff acknowledges that Shoemaker already discloses storing multiple account data sets (*id.* at Q/A 487 (citing RX-0884 at 13:51-14:7)), even though Shoemaker also teaches creating reverse tracks on the fly. Lastly, Dynamics offers no secondary evidence of non-obviousness. *See* CIB at 36-40.

[REDACTED]

Accordingly, in view of the *Graham* factors, Samsung has not made a clear and convincing case for the combination of Gutman and Shoemaker to invalidate claims 1 and 7 of the 153 patent.

V. U.S. PATENT NO. 10,032,100

A. Level of Ordinary Skill in the Art

As with the 153 patent, a person having ordinary skill in the art of the 100 patent at the time of invention “would have: an undergraduate degree in computer science, electrical engineering, or the equivalent (including computer engineering) and at least three years of experience with point of sale systems and the use of magnetic fields to convey information.” Order No. 7 at 7.

B. Claims-at-Issue

Claims 1, 4, 6, 8, 12, and 18 of the 100 patent are at issue in this investigation, either through allegations of infringement or of the domestic industry technical prong. *See* CIB at 47, 52. These claims are reproduced below:

1. A device comprising:

a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader; and

a processor for controlling the circuit,

wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head.

....

4. The device of claim 1, wherein the device is a portable telephonic device.

....

6. The device of claim 1, further comprising a display operable to display a virtual card.

....

8. The device of claim 1, wherein the circuit is operable to emit a second electromagnetic field.

....

12. A portable telephonic device comprising:

a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader; and

a processor for controlling the circuit, wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader.

....

18. The portable telephonic device of claim 12, further comprising a second circuit operable to emit a second electromagnetic field.

100 patent at cls. 1, 4, 6, 8, 12, 18.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 100 patent were construed, either as agreed between the parties or determined by Order No. 7:

Claim Term	Construction
“virtual card”	“visual representation of a payment card”

See Order No. 7 at 38.

1. “operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader”

As with the 153 patent, I declined for reasons expressed in Order No. 7 to construe “operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader.” *Id.* at 37.

In its initial post-hearing brief, Dynamics proposes a new construction of “operable to receive an electrical current that causes the circuit to emit an electromagnetic field that couples to

[REDACTED]

and transmits data to a read-head located on a magnetic stripe reader.” CIB at 42. Dynamics asserts this construction is consistent with the observation that “electrical coupling refers to a general state of electrical interaction between two devices, which is necessarily broader than just electrical communication of data.” *Id.* Dynamics states, “[f]or example, wireless smartphone charging is certainly an electrical coupling, yet no data is communicated” (*id.* (citing Order No. 7 at 30)) and the invention’s practical operation involves electrical coupling (*id.* (citing 100 patent at 1:65-2:6, 5:54-61); *see generally id.* at 43-44 (“when providing examples of how the electromagnetic field is used to communicate data to a read-head, the specification of the ’100 patent describes a coupling process that requires electricity in order to be accomplished”)). Dynamics summarizes, “[t]he ’100 patent consistently describes electrical coupling as coupling that occurs between a magnetic emulator (*i.e.*, a coil) and a read-head when a current is input to the emulator, thereby generating an electromagnetic field that communicates with the read-head.” *Id.* at 45.

In reply, Dynamics argues Samsung “elevate[s] extrinsic evidence over intrinsic evidence” and generally fails to acknowledge the specification’s disclosures. CRB at 31 (citing *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015)). Dynamics also disputes Samsung’s position that “inductive coupling cannot be a species within the genus of electrical coupling” based, in part, on textbook evidence. *Id.* at 33 (citing RX-1485 (“In electrical engineering, two conductors are said to be inductively coupled or magnetically coupled when they are configured such that a change in current through one wire induces a voltage across the ends of the other wire through electromagnetic induction.”); 100 patent at 1:60-2:6, 8:24-65, 12:64-14:9).

In its initial brief, Samsung focuses on the “electrically couple” portion of the larger construction and notes the parties are in agreement it should be assigned its plain and ordinary

meaning of “coupling in which electrical energy is transferred between components or circuits.” RIB at 60-1 (citing, *inter alia*, Hr’g Tr. at 222:14-18, 223:4-8). Accordingly, Samsung emphasizes “there must be a transfer of electrical energy from the circuit to the read head. This is in contrast to a transfer of magnetic energy, which is magnetic—or inductive—coupling,” while also noting inductive coupling is not prohibited from occurring alongside the electrical coupling. *Id.* at 61; *see* RRB at 21-22. Samsung adds, “[e]ven Mr. Zatkovich admits that a standard magnetic stripe card, which uses magnetic fields, does not electrically couple, because it does not transfer electrical energy to the read head, *i.e.*, there is no electrical interaction with the read head.” RIB at 62 (Hr’g Tr. at 224:2-225:8; CX-1199C at Q/A 64).

In reply, Samsung characterizes Dynamics’ position as “designed to capture any type of coupling provided electricity is involved in its generation.” RRB at 21. Samsung argues “[t]his is contrary to the ordinary meaning, which defines a coupling by the type of energy that is *transferred between two components*, not how that energy is generated. Under Dynamics’ logic, the coupling used in MST could equally be called ‘chemical coupling,’ because the current applied to the coil originates in the Samsung battery.” *Id.* (emphasis in original); *see id.* at 25 (citing far-field RFID as example of true electrical coupling). Samsung also views Dynamics’ construction as contrary to Order No. 7, which emphasized electrical interaction. *Id.* at 23 (citing Order No. 7 at 26-30).

For this term, the intrinsic evidence strongly favors Dynamics’ position. In stark contrast to the 153 patent’s lack of explicit description for “analog waveform,” the 100 patent is clear that its emulator “electrically couples” to the read-head of a magnetic stripe reader to communicate data:

[REDACTED]

The magnetic emulator may be, for example, a circuit that emits electromagnetic fields operable to electrically couple with a read-head of a magnetic stripe reader such that data may be transmitted from the circuit to the magnetic stripe reader.

....

An electromagnetic field may be generated by the emulator such that the emulator is operable to electrically couple with a read-head from a magnetic stripe reader without making physical contact with the read-head.

....

A magnetic emulator may be provided as device 151. Device 151 may be operable to electrically couple with a read-head of a magnetic stripe reader. Persons skilled in the art will appreciate that a read-head housing of a magnetic stripe reader may be provided with one, two, or three active read-heads that are operable to each couple with a separate magnetic track of information.

....

Accordingly, a magnetic emulator may transmit data serially while a read-head is electrically coupled with a magnetic reader.

....

Accordingly, emulator 351 may be driven to electrically couple with an RFID receiver and emulator 351 may also be driven to electrically couple with a magnetic stripe reader. Accordingly, processor 360 may drive emulator 351 to communicate information (e.g., payment information that includes dynamic information) to an RFID receiver when an RFID field is present and to a magnetic stripe reader when a magnetic stripe is present.

....

Card 730 may be provided with emulator 731 and may electrically couple with a read-head of magnetic stripe reader 710. Any number of emulators may be provided in card 730 in any number of orientations such that the appropriate electromagnetic field may couple with a read head of read-head housing 711 regardless of the orientation of card 720 with respect to read-head 711.

100 patent at 1:30-34, 1:65-2:2, 4:11-18, 5:59-61, 7:8-15, 8:50-56. The patent also includes a figure, captioned as showing “electrical coupling” (*id.* at 3:24-26), an “electromagnetic field 791”:

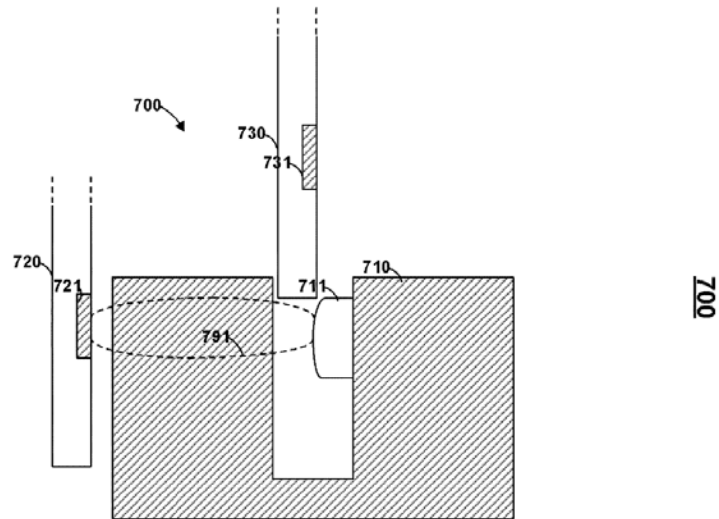


FIG. 7

100 patent at Fig. 7. Not surprisingly, the elliptical lines of electromagnetic field 791 resemble the known lines of magnetic fields (as described by Samsung's expert, Dr. Apsel):

Technical Background

- Magnetic fields are vector fields that describe the magnetic influence exerted by whatever has generated the magnetic field
- At any given point, the magnetic influence exerted by the source of the field has both a magnitude and a directional component:

Magnetic Field of a Bar Magnet

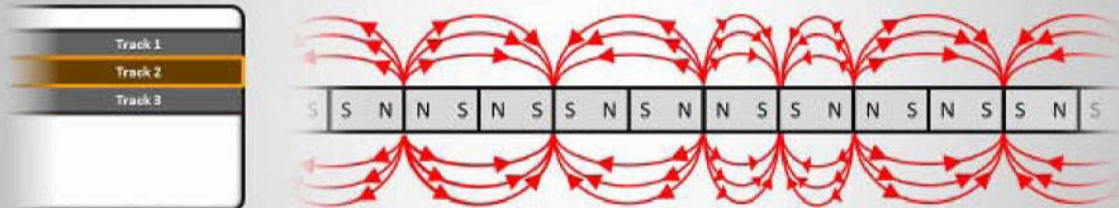
Magnetic Field of a Coil

RDX-1008

RDX-1008;

Technical Background

- **Magnetic communication uses magnetic fields to communicate data**
- **Many small ferromagnetic particles are encoded into “domains,” which generate a local magnetic field with a polarity in one direction or another:**



- **Magnetic communication is used by magnetic storage media, like audio cassettes, hard disk drives, and payment card magnetic stripes**

RDX-1010

RDX-1010; *see* RX-1675C at Q/A 44-46, 54. Thus, there is strong support for finding that “electrical coupling” as used in the 100 patent can include the use of magnetic fields to induce electrical responses. This is consistent with the record evidence showing magnetic read-heads only respond substantively to magnetic energy. *See* RIB at 62 (citing Hr’g Tr. at 224:2-6; CX-1199C at Q/A 64)); RX-1675C at Q/A 32 (“Magnetic stripe readers detect data encoded in magnetic fields of alternating polarity.”), 53-57, 63-70, 73-76, 108; 100 patent at 4:11-18 (“A magnetic emulator may be provided as device 151. Device 151 may be operable to electrically couple with a read-head of a magnetic stripe reader. Persons skilled in the art will appreciate that a read-head housing of a magnetic stripe reader may be provided with one, two, or three active read-heads that are operable to each couple with a separate magnetic track of information.”). Indeed, Samsung’s expert, Dr. Apsel, at no point opines that data may be communicated to magnetic stripe read-heads using electrical energy despite arguing the patent claims are limited to that. *See generally* RX-1675C. It is reasonable, therefore, to find that a person having ordinary



skill in this art would understand “electrical coupling” as used in the 100 patent to include, at least, magnetic energy passed between an emulator and a magnetic read-head.

There is also no mention in the 100 patent of the “magnetic” or “inductive” coupling Samsung argues is distinct from and takes place instead of “electrical coupling” in communicative interactions with magnetic stripe read-heads. If this type of coupling would have been discussed in the patent—poised as an alternative to “electrical coupling”—Samsung’s position would certainly be strengthened; but it is not. *See generally* 100 patent. Indeed, while Samsung affirmatively states such things as “[i]n fact, the specification describes both magnetic and electrical coupling,” it provides no citation in support. RRB at 24; *see* RIB at 60-62; RRB at 21-26.

In another example, Samsung refers to “Far-field RFID” as “described in the ’100 specification” to further argue that the patent recognizes a difference between “electrical coupling” and the coupling that occurs with magnetic stripe read-heads. RRB at 25. Yet, Samsung cites to expert testimony instead of the patent (*see id.* (citing RX-1675C at Q/A 131)), with that testimony also failing to identify any passage in the patent, stating only “Q. Do the Mullen Patents discuss FM radio? A. No, but they do discuss electrically coupling to an RFID reader, which involves the same type of electrical coupling.” RX-1675C at Q/A 131.

With that said, it is true the 100 patent discusses RFID in several places. *See, e.g.*, 100 patent at 6:61-7:22. But the patent does not, as Samsung argues, make it clear that RFID involves an electrical coupling distinct from a magnetic/inductive coupling—quite the opposite in fact:

A magnetic emulator may be operated to electrically couple, and transmit data to, devices other than a magnetic stripe reader. For example, a magnetic emulator may be operated to electrically couple, and transmit data to, a device using a Radio Frequency IDentification (RFID) protocol. Accordingly, a processor may drive the emulator at a frequency and magnitude in order to electrically couple with a read-

head of a magnetic stripe reader and then drive the emulator at a different frequency and a different magnitude in order to electronically couple with an RFID reader.

Id. at 2:7-17, 7:5-11 (“Emulator 351 may be able to generate electromagnetic fields of different frequencies and magnitudes, and operate in different manners, depending on drive signals provided by processor 360. Accordingly, emulator 351 may be driven to electrically couple with an RFID receiver and emulator 351 may also be driven to electrically couple with a magnetic stripe reader.”). Even assuming, for the sake of argument, the patent was referring to “far field” (term not used) RFID in this discussion, which Samsung asserts uses true “electrical coupling” and not magnetic/inductive coupling (RRB at 25), then the most reasonable conclusion is that the 100 patent uses the term “electrical coupling” for both types.

Samsung also refers to an apparent agreement between the parties’ experts that “electrically couple” should receive its plain and ordinary meaning of “coupling in which electrical energy is transferred between components or circuits.” *See* RIB at 61 (citing, *inter alia*, RX-1675C at Q/A 67; CX-1199C at Q/A 52; Hr’g Tr. at 222:14-18, 223:4-8); RRB at 21-22. This definition, taken from a dictionary (RX-0593 at *9; Hr’g Tr. at 222:19-223:8), is reasonable but ultimately not consistent with the 100 patent’s repeated use of the term. The patent is clear that the emulator’s generation of an electromagnetic field “is operable to electrically couple with a read-head from a magnetic stripe reader” in order to communicate information. 100 patent at 1:65-2:10. There is no indication in the intrinsic record that read-heads of magnetic stripe readers are capable of receiving or responding to the transfer of electrical energy *apart* from that electrical energy induced by a magnetic field. The invention is, after all, a “magnetic emulator.” *See, e.g.*, 100 patent at Abstract; RX-1675C at Q/A 72 (“Q. What is magnetic emulation? A. Magnetic emulation refers to emulating magnetic stripe data, and is typically performed by replicating the way swiped magnetic stripes communicate with the read-heads in magnetic stripe readers and

payment terminals.”).

In sum, the overwhelming weight of the intrinsic evidence shows that, for this invention, the phenomenon in which an emulator runs current through a coil to produce electromagnetic energy, with that energy travelling over a distance to a magnetic read-head, and inducing a voltage within that read-head, is “electrical coupling.” *See Phillips*, 415 F.3d at 1314, 1317. This is commensurate with the observation made in Order No. 7 that “electrical coupling” is a general term referring to “electrical interaction between two devices.” Order No. 7 at 30. If it is true that the patent drafter mistakenly viewed this activity as “electrical coupling” rather than the customary “magnetic coupling,” the law defers to the patent’s usage. *McRO, Inc. v. Bandai Namco Games America Inc.*, 959 F.3d 1091, 1099 (Fed. Cir. 2020) (“But the existence of one broader meaning in the field is not controlling. What matters is the meaning most appropriate in the context of the particular patent. Here, it is clear, based on the intrinsic evidence, that the term ‘vector’ has the narrower geometric meaning in this patent.”).

2. “a device” and “a portable telephonic device”

In addition, Dynamics now proposes the preambles to claim 1, “a device,” and claim 12, “a portable telephonic device,” should be construed as limiting and given their plain and ordinary meanings. CIB at 45-46. Dynamics argues the plain and ordinary meaning of “a device” is “one device,” and, correspondingly, the meaning of “a portable telephonic device” is “one portable telephonic device.” *Id.* at 45. Dynamics explains these constructions are to differentiate from “any number of separate and distinct devices which otherwise operate as a system.” *Id.* For support, Dynamics refers to the patent’s “figures depicting that the limitations recited in the independent claims are embodied within a single device, rather than a system of separate and distinct devices” and those parts of the specification where “a single embodiment is logically inferred.” CRB at 28 (citing 100 patent at 7-10 [sic], 16-19 [sic], 23 [sic], Figs. 2-4, 10; *AbTox*

[REDACTED]

Inc. v. Exitron Corp., 122 F.3d 1019, 1024, 1027 (Fed. Cir. 1997)). Dynamics also suggests the claims of the 100 patent “contradict[]” treatment of “device” as non-limiting alleging later uses of “device” in dependent claims and claim 2’s requirement that the device be “thicker than a payment card” and claim 3 requiring a “wireless communication device.” CRB at 29-30 (citing 100 patent at cls. 2, 3).

Samsung disputes the terms are limiting under the general rule “‘a preamble is not limiting ‘where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.’” RIB at 58 (citing *Catalina Mktg. Int’l, Inc. v. Coolsavings.com Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002)). Samsung also remarks “the Federal Circuit has characterized ‘device’ as a ‘nonce word’ that does not connote any particular structure.” *Id.* (citing *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1350 (Fed. Cir. 2015)). If limiting, Samsung argues “there is no basis to construe it to mean ‘a single device’ as Dynamics proposes.” *Id.*

The preambles are not limiting. Beginning with claim 1, “device” does not connote or suggest any structure or feature, in a plain and ordinary sense or in how it is used within the patent.

At times the term is used to refer to overall commercial products (*e.g.*, inventive card, magnetic stripe reader, memory storage, etc.). 100 patent at 2:52-54 (“Dynamic information may be provided by a processor located on the card, or other device, and communicated through a magnetic emulator”), 2:33-39 (“A circuit may be provided on a credit card that is operable to receive data from a magnetic stripe encoder and/or an RFID transmitter. Such a circuit may electrically couple with an RFID transmitter and/or magnetic stripe encoder and deliver information to a processor. In this manner, a card, or other device, may communicate bi-directionally with a device.”), 10:17-25 (“Person skilled in the art will also appreciate that a card

[REDACTED]

may be cloned by a thief, for example, when the thief puts [an] illegitimate credit card reader before a legitimate credit card reader and disguising the illegitimate credit card reader. . . . In doing so, for example, a bank, or the police, may be notified of the possibility of the presence of a *disguised cloning device*.” (emphasis added)), 10:53-54 (“In doing so, a merchant may be protected from having credit card numbers stolen from its various storage devices.”).

At other times, it refers to components within those products (*e.g.*, emulator circuitry, read-head, etc.). 100 patent at 4:10-14 (“Card 150 may be provided. Card 150 may include static magnetic stripe tracks 153 and 152. A magnetic emulator may be provided *as device 151*. *Device 151* may be operable to electrically couple with a read-head of a magnetic stripe reader.” (emphasis added)), 4:23-28 (“For example, the read-head housings may be provided on opposite walls of a trough sized to accept payment cards. Accordingly, *the devices* on the opposite sides of the trough may be able to read a credit card regardless of the direction that the credit card was swiped.” (emphasis added)), 5:22-24 (“Batteries may be, for example, rechargeable and contacts, or other devices, may be provided on card 100 such that the battery may be recharged.”), 12:1-7 (“Persons skilled in the art will appreciate, for example, that a card may include an IC chip (*e.g.*, EMV chip), RFID, and a dynamic magnetic communications device (*e.g.*, a magnetic emulator or encoder). The same information may be communicated through, for example, any number of such devices (*e.g.*, a dynamic magnetic communications device, RFID, and an EMV chip”).

Given that the 100 patent uses “device” to describe more than the invention, it is not proper to impute important features or aspects of the invention into the definition of “device.” *Abtox*, 122 F.3d at 1024 (stating “in this instance, this court seeks the meaning of the claim terms by examining their fuller context,” and then examining the specification). Further, Dynamics does not argue “a device” has any particular meaning, only that it be seen as limiting the invention to a single such

[REDACTED]

thing. CRB at 28. It is therefore difficult to see how “device” could possibly “give life, meaning, and vitality” to the body of claim 1, which otherwise concerns an emulator circuit and its ability to couple and communicate with a magnetic stripe reader. *See Catalina Mktg.*, 289 F.3d at 808; 100 patent at cl. 1. This is also true for dependent claims 8-11, which similarly solely concern that circuit. As for dependent claims 2-7, these do concern the overall device as opposed to the circuit, but the lack of any real meaning for “device” prevents its ability to give context to each claim.

Moreover, “[w]hether to treat a preamble as a limitation is a determination ‘resolved only on review of the entire patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim.’” *Catalina Mktg.*, 289 F.3d at 808 (citing, *inter alia*, *Corning Glass Works v. Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989)). Dynamics argues a review of the patent “clearly indicates the patentee’s intent to limit the term ‘a device’ to mean a singular device . . . as opposed to a system of separate and distinct devices.” CRB at 28. The 100 patent, however, is expressly flexible as to the nature of the product which would contain the otherwise allegedly inventive magnetic emulator—*i.e.*, it is not important:

In other words, for example, the emulator may be located in a device that is thicker than a card—yet the emulator can still communicate with one or more read-heads located in a magnetic stripe reader. Such a device may be, for example, a security token, a wireless communications device, a laptop, a Personal Digital Assistant (PDA), a physical lock key to a house and/or car, or any other device.

. . . .

A magnetic emulator may be provided and may be positioned on card 150 such that when card 150 is swiped through a credit card reader, the magnetic emulator passes underneath, or in the proximity of, a read-head for a particular magnetic track. An emulator may be large enough to simultaneously pass beneath, or in the proximity of, multiple read-heads.

. . . .

Persons skilled in the art will appreciate that card 720 may be coupled to a device via a permanent or removable cable. Such a device may provide power to card 720 as well as control information—such as control information for emulator 730.

....

Persons skilled in the art will appreciate that any type of device may be utilized to provide dynamic magnetic information on a card to a magnetic stripe reader.

....

FIG. 12 shows personal electronic device 1200 which may be, for example, a portable telephonic device, portable media player, or any type of electronic device.

100 patent at 2:44-51, 4:29-35, 8:40-44, 11:20-22, 12:32-34. Among these is an embodiment with an emulator-containing card connected via a “permanent or removable cable” to a separate device. *Id.* at 8:40-44. This is not a clear intent to exclude a collection of multiple things (for lack of a better word) from the scope of the invention. Accordingly, the preamble of claim 1 of the 100 patent is not limiting.

The preamble of claim 12, “a portable telephonic device,” is in similar straits. As with claim 1, the body of claim 12 is focused on the emulator circuit with no relation to the portability or telephonic properties of a “portable telephonic device.” As the specification excerpts reproduced above show, a cellphone is just one of many products that could house the invention. Dependent claims 14 and 18-20 are similarly focused and with no relation to a phone. Dependent claims 13 and 15-17 recite additional features for the overall device, but again, with no connection to portability or telephonic properties. In this way, “portable telephonic device” is simply the context or intended environment in which the structurally complete invention exists and is not limiting. *See Catalina Mktg.*, 289 F.3d at 808.

3. “operable to”

As noted above, the parties dispute whether software required for MST functionality must be present on a device to infringe the asserted patents under the “operable to” claim language. While the parties do not discuss any of the claims of the asserted patents individually, and it is determined above that claim 1 of the 153 patent requires such software, certain claims of the 100

patent do not.

To begin, the limitations in the 153 patent reciting software-dependent functions are absent here. In the 100 patent, the type of data is not specified; instead, only “a circuit operable to . . . transmit data” and “operable to communicate data” is required. 100 patent at cls. 1, 4, 6, 8, 12, 18. Further, the recited functions are closer to what would be the result from basic activation of the recited hardware—*e.g.*, a circuit operable to “emit an electromagnetic field,” “transmit [any] data,” “communicate [any] data . . . at a distance.” *Id.* at cl. 1; *see id.* at cl. 12. For these claims then, the software may be necessary for operation, but it is part of the expected environment rather than a claim limitation. *Nazomi*, 739 F.3d at 1344-5; *Silicon Graphics*, 607 F.3d at 795.

The exception is claim 6, “[t]he device of claim 1, further comprising a display operable to display a virtual card.” 100 patent at cl. 6. The display of a virtual card (as construed by the parties) is not an inherent feature of any sort of “display.” It does not come from mere activation but from specific programming, akin to the “track of magnetic stripe data” in claim 1 of the 153 patent. Thus, “operable to display a virtual card” in claim 6 requires a hardware-software combination that must perform the described function.

D. Infringement

According to Dynamics’ post-hearing briefing, the use, manufacture, or sale of the Accused Products are alleged to infringe claims 1, 4, 6, 12, and 18 of the 100 patent. *See* CIB at 47. Of these, claims 1 and 12 are independent, and claims 4, 6, and 18 dependent. For the reasons discussed below, Dynamics has shown infringement of claims 1, 4, 6, 12, and 18 of the 100 patent by certain products.

As with the 153 patent, the preliminary issue of whether Samsung’s Accused Products infringe at the time of importation needs to be resolved. As determined above, only claim 6 of the

[REDACTED]

100 patent requires the presence of enabling software. As the Galaxy A50, Galaxy Note10, and Galaxy Note10+ do not include Samsung Pay at the time of importation, these devices do not infringe claim 6. The remaining Accused Products, otherwise including Samsung Pay but lacking a registered credit card number, are not barred from infringement on this ground, however.

Additionally, adjudication of the Hardware-Modified Products and the Software-Modified Products is warranted. For the same reasons as the 153 patent, there is no dispute the Hardware-Modified Products lack the necessary components to practice the claims of the 100 patent. *See, e.g.,* RX-0051C at *4, 12; RIB at 36. Accordingly, the Hardware-Modified Products do not infringe the 100 patent.

As to the Software-Modified Products, the above discussion of “operable to” as used in claims 1 and 12 of the 100 patent does not require that the device actually perform the recited functions. Thus, the elimination of the precise code used to power the MST IC, or even the lack of the Samsung Pay application generally, is not a barrier to infringement of these independent claims. As to claim 6, which was determined above to require any necessary software to accomplish the function “display a virtual card,” the depowering of the MST IC would not appear to be relevant at all. Hence, the Software-Modified Products may still infringe the asserted claims of the 100 patent alongside the Accused Products, as discussed below.

1. Undisputed Claims

Samsung does not contest Dynamics’ claims of infringement under claims 4 and 6, apart from their dependency on claim 1 for which infringement is disputed. *See* RIB at 62-70; RRB at 27-30. In view of the testimony of Mr. Zatkovich that the Accused Products include the limitations recited in these claims, and there being no clear disagreement from Samsung as to that fact, the Accused Products meet the limitations of the dependent claims as alleged, with the exception of claim

[REDACTED]

6 (requiring software) and the Galaxy A50, Galaxy Note10, and Galaxy Note10+. *See* CX-1199C at Q/A 101-102; CIB at 50-51.

2. Disputed Claims

Samsung contests Dynamics' claims of infringement under independent claims 1 and 12 and dependent claim 18. *See* RIB at 62-70.

a. Claim 1

For reference, claim 1 of the 100 patent requires:

1. A device comprising:

a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader; and

a processor for controlling the circuit,

wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head.

100 patent at cl. 1. There are two disputes between the parties as to whether the Accused Products meet the limitations of this claim—disputes over “electrically couple” and “emit an electromagnetic field.” These are discussed below. For those remaining limitations which are not in dispute, the Accused Products have been shown to meet them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 96-97, 99; CIB at 48-50.

As to whether the Accused Products “electrically couple” and communicate data to a magnetic stripe reader through that coupling, the weight of the evidence shows that they do. Dynamics summarizes the practicalities of the products' operation as:

[REDACTED] *i.e.*, “the circuit operable,” to emit an electromagnetic field. CX-1199C (Zatkovich) at Q/A 98, 136-137; Tr. (Choe) at 480:14-481:1; Tr. (Prasad) at 496:10-19; RX-1671 (Lee) at Q/A 21. This electromagnetic field interacts with the ferromagnetic material in a read-head of a magnetic stripe card reader. CX-1199C (Zatkovich) at Q/A 98, 136-137; Tr. (Choe)

[REDACTED]

at 480:14–481:1; Tr. (Prasad) at 496:10-19; RX-1671 (Lee) at Q/A 21. This induces a voltage (*i.e.*, electricity in the form of an electromotive force) in the read-head, which allows the read-head to decode the data from the electromagnetic fields and further process the transaction. CX-1199C (Zatkovich) at Q/A 98, 136-137; Tr. (Choe) at 480:14–481:1; Tr. (Prasad) at 496:10-19; RX-1671 (Lee) at Q/A 21.

CIB at 48-49. Samsung does not dispute this description other than to argue the field emitted by MST is a magnetic field—not electric (*see* RIB at 64)—and the resulting coupling is likewise magnetic or inductive coupling—not electric (RIB at 65-70; RRB at 27-28). As determined above, however, the correct construction for “electrical coupling” encompasses a field created by the provision of an electrical current to a coil to trigger a field that interacts with the magnetic properties of a magnetic stripe read-head. MST operates in precisely the same way and, thus, matches the 100 patent’s repeated and consistent description of “electrical coupling.” *See, e.g.*, 100 patent at 5:54-61 (“Persons skilled in the art will appreciate that processor 220 may cause a current to flow through a coil of emulator 202 in a different direction to produce different electromagnetic fields. The transitions between the different electromagnetic fields may be sensed by a magnetic stripe reader as information. Accordingly, a magnetic emulator may transmit data serially while a read-head is electrically coupled with a magnetic reader.”).

The same is true for the “emit an electromagnetic field” limitation. The 100 patent consistently refers to the field produced by a “magnetic emulator” operating in the above manner as an “electromagnetic field.” *See, e.g.*, 100 patent at 1:28-34, 5:54-61. The patent also describes the use of its invention in close distances to card readers, in terms of inches. *See, e.g., id.* at 2:2-6, 8:29-39. To the extent the patent has misused the plain and ordinary meaning of “electromagnetic field” in its claims to describe a “magnetic field” (see RX-1675C at Q/A 49, 108 (explaining electromagnetic fields cannot be used for communication at short ranges); RIB at 66 (discussing “as a matter of science,” 5 cm operating range must be a magnetic field)) the law defers to the patent’s usage (*McRO*, 959 F.3d at 1099 (“But the existence of one broader meaning in the

[REDACTED]

field is not controlling. What matters is the meaning most appropriate in the context of the particular patent. Here, it is clear, based on the intrinsic evidence, that the term ‘vector’ has the narrower geometric meaning in this patent.”)).

Accordingly, the Accused Products, and Software-Modified Products, infringe claim 1 of the 100 patent.

b. Claim 12

For reference, claim 12 of the 100 patent requires:

12. A portable telephonic device comprising:

a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader; and

a processor for controlling the circuit, wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader.

100 patent at cl. 12. The disputes between the parties on claim 12 are the same as claim 1—whether the Accused Products “electrically couple” and “emit an electromagnetic field.” *See* RIB at 62-70. For those remaining limitations which are not in dispute, the Accused Products have been shown to meet them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 103, 105; CIB at 51.

As to whether the Accused Products “electrically couple” and communicate data to a magnetic stripe reader through that coupling, the weight of the evidence shows that they do for the same reasons discussed with claim 1. The same is true for whether the products “emit an electromagnetic field.” Accordingly, the Accused Products, and Software-Modified Products, infringe claim 12 of the 100 patent.

c. Claim 18

For reference, claim 18 of the 100 patent requires:

[REDACTED]

18. The portable telephonic device of claim 12, further comprising a second circuit operable to emit a second electromagnetic field.

100 patent at cl. 18. For this claim, Dynamics argues the Asserted Products include an RFID electromagnetic field used to communicate with point-of-sale terminals using near field communication (“NFC”) protocols. CIB at 52 (citing CX-1199C at Q/A 106; CX-0376). Samsung disagrees, arguing “the NFC circuitry . . . communicates using ‘only an alternating magnetic field,’ not an electromagnetic field.” RIB at 70 (citing RX-1484 at *4; RX-1675C at Q/A 151-154; RX-1667 at *8; RX-1668 at *8); *see* RRB at 30.

The limitation is met in the Accused Products. As noted above, the intrinsic evidence of the 100 patent describes the use of “electromagnetic fields” to couple and communicate data from an energized coil to magnetic stripe read-heads. *See, e.g.*, 100 patent at 5:54-61. Given that magnetic stripe read-heads are only responsive to magnetic fields for this communication, it is reasonable to treat the patent’s use of “electromagnetic fields” as encompassing magnetic fields. As Samsung concedes the Accused Products include [REDACTED] to emit NFC magnetic fields, the limitation is met.

Accordingly, the Accused Products, and Software-Modified Products, infringe claim 18 of the 100 patent.

E. Domestic Industry – Technical Prong

According to Dynamics’ post-hearing briefing, all DI Products practice claims 1, 6, and 8 of the 100 patent (CIB at 52), but only the Emirates NBD device is mentioned specifically under claim 6’s discussion (*id.* at 54); and no discussion of claim 8 is provided at all (*see id.* at 52-54; CRB at 36-39). For the reasons discussed below, Dynamics has shown by a preponderance of the evidence that the DI Products practice claim 1, but not claim 6 or claim 8.

[REDACTED]

Again, no actual article of the Emirates NBD device has been shown to exist at the time of the filing of Dynamics' complaint. *Thermoplastic Motors*, Inv. No. 337-TA-1073, Comm'n Op. at 10. Dynamics makes no argument that "significant and unusual developments" have occurred to consider post-complaint evidence, nor has Dynamics argued domestic industry for the 100 patent is "in the process of being established." *See generally* CIB; CRB. Accordingly, and apart from the discussion below, the Emirates NBD device cannot support domestic industry under the 100 patent.

1. Claim 1

Claim 1 of the 100 patent is presented above in connection with infringement. The primary dispute between the parties is whether the DI Products are operable while outside a magnetic stripe reader. This is discussed below. For those remaining limitations which are not in dispute, the DI Products have been shown to practice them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 80-81; CIB at 34-35.

As to "operable to communicate . . . while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch," Dynamics argues Mr. Zatkovich "was able to communicate data to a read-head from outside the card reader" using a piece of metal to trigger the [REDACTED] *See* CIB at 53-54 (citing, *inter alia*, CX-1199C at Q/A 94; Hr'g Tr. at 84:1-85:4; CX-1198C at Q/A 64-66). Dynamics contends Samsung's expert, Dr. Apsel, was also "able to successfully communicate card data from a DI product while the product was located outside the reader." *Id.* at 54 (citing Hr'g Tr. at 582:16-583:5).

In its reply brief Dynamics dismisses any unsuccessful attempts at outside the reader communication under the rule that "where claim language recites 'capability, as opposed to actual operation,' an apparatus that is 'reasonably capable' of performing the claimed functions 'without

[REDACTED]

significant alterations’ can infringe those claims.” CRB at 36 (citing *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1362 (Fed. Cir. 2018)); *see id.* at 37 (citing *Wisconsin Alumni Research Found. v. Apple Inc.*, 905 F.3d 1341, 1349 (Fed. Cir. 2018) (“[A] product that ‘sometimes, but not always, embodies a claim nonetheless infringes.’”)). Dynamics also disputes that use of a piece of metal to artificially trigger [REDACTED] is a “modification” of the DI Products. *See id.* at 36-38. Rather, according to Dynamics, it is a “secondary benefit.” *Id.* at 38.

In opposition, Samsung argues the DI Products “are specifically designed to prevent outside-the-reader communication.” RIB at 71 (citing RX-1675C at Q/A 184-206; Hr’g Tr. at 583:23-584:12, 606:1-607:23); *see id.* at 72 (describing intentional credit card form factor); *see id.* at 72-73, 74 (describing [REDACTED]); RRB at 31 (“Dynamics asks the Commission to find a domestic industry in patents that its products are specifically designed not to practice.”). Samsung explains “[t]he reason Dynamics purposely designed the DI Products to not be operable outside the reader is that all of the DI Products [REDACTED] [REDACTED] and [REDACTED] cannot be read by a card reader because of signal interference.” RIB at 73 (citing, *inter alia*, CX-1198C at Q/A 53-54; Hr’g Tr. at 86:6-13, 51:19-52:3, 606:1-607:1, 608:23-609:12, 609:21-611:18, 317:6-15; RX-1675C at Q/A 205-206, 233-234); *see id.* at 73-74 (citing RX-0042C at 24:4-7).

Samsung contends the aforementioned use of a piece of metal to trigger the communication is an improper “modification” to the device and regardless, only allows for “rare and random happenstances” of communication. RIB at 71; *see* RIB at 75 (citing Hr’g Tr. at 41:22-42:11, 48:15-49:2, 83:17-25, 84:20-85:4, 260:8-261:2); RRB at 31 (citing *High Tech Med.*, 49 F.3d at 1555; *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1330 (Fed. Cir. 2001)). Specifically, Samsung refers to a series of tests performed by Dynamics’ employee, Mr. Workley,

[REDACTED]

and by Samsung's expert, Dr. Apsel, that "generally produced errors or nothing at all." RIB at 77 (citing, *inter alia*, Hr'g Tr. at 53:6-15, 608:18-609:20; RX-0042C at 211:12-212:5, 213:2-22, 215:2-6, 217:3-10; RX-1675C at Q/A 202-203; RDX-1065C); RRB at 32-33. This is especially true, Samsung reports, for attempts to communicate both track 1 and track 2 data, which never occurred. *See* RIB at 78 (citing, *inter alia*, Hr'g Tr. at 53:6-54:11, 88:20-89:8, 261:19-23, 263:7-16, 608:23-609:12, 611:24-612:2; RX-1675C at Q/A 202-203); RRB at 32. Samsung concludes:

Moreover, Dynamics' own chief scientist testified that [REDACTED]

[REDACTED] *See* Tr. (Workley) at 51:5-9; *see also id.* at 46:19-24, 84:20-85:4, 88:8-89:2; CX-1198C (Workley) at Q/A 53-54; RX-0042C (Workley) at 24:4-7, 24:25-25:9.

RRB at 33.

The weight of the evidence does not support finding the limitation met in *all* the DI Products. The relevant claim limitation states "wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head." 100 patent at cl.1. The most natural means of showing this limitation in a product would be experimental testing, especially for products designed for inside-the-reader swiping.

As to testing, Dynamics has presented almost no evidence on the methods and results of Mr. Zatkovich. *See* CX-1199C at Q/A 94. Instead, Dynamics summarily argues Mr. Zatkovich "was able to communicate data to a read-head from outside the card reader" (CIB at 53; *see* CX-1199C at Q/A 94) as was Samsung's expert, Dr. Apsel (CIB at 54). This would ordinarily be insufficient on its own.

[REDACTED]

Samsung, however, has presented additional information as to *both* parties' test methods and results; and it demonstrates that at least one DI Product is operable as claimed. Dr. Apsel testified that she tested samples of each DI Product against sixteen different magnetic stripe readers. RX-1675C at Q/A 200; RDX-1065C. Of these, Dr. Apsel reports that no data was successfully communicated to fifteen of them, but a complete Track 1 data set was communicated using the MagTek 21040145 reader and the CIBC product. RX-1675C at Q/A 202-203; RDX-1065C. Interestingly, Dr. Apsel notes that this is the same reader model used by Mr. Zatkovich (RX-1675C at Q/A 202)—assumedly serving as the basis of Mr. Zatkovich's statement that "I performed such an act in my analysis of the Dynamics products and recorded my results, which showed the card reader reading track 2 data multiple times" (CX-1199C at Q/A 94).

In conclusion, Dr. Apsel surmises "[t]hey suggest to me that the read-heads in the MagTek 21040145 are unusually sensitive." RX-1675C at Q/A 204. This is a reasonable conclusion. Dr. Apsel continues, "[b]ut more importantly, they confirm that the DI Products are not operable to communicate from outside the reader." *Id.* This is not as reasonable. Clearly, the evidence supports finding that one product, the CIBC card, is operable with at least one brand of magnetic stripe reader, the MagTek 21040145. As the claim does not specify the type of reader, the limitation is met for this DI Product. As to the other DI Products, however, there is no evidence that they were similarly operable beyond Mr. Zatkovich's generalized statements. CX-1199C at Q/A 94. As mentioned, this is insufficient.

As to Samsung's arguments that no product should be deemed "operable" because of their intended use inside a card reader (*see* RIB at 71-75, 78), this is a claim construction issue which necessarily ties operability to designer intent and has not been sufficiently briefed (*see generally id.* (failing to discuss intrinsic and extrinsic evidence)). To the contrary, a plain and ordinary

[REDACTED]

meaning for “operable to” as in claim 1 of the 100 patent would simply be “can be operated to.” The testing from Dr. Apsel and Mr. Zatkovich were designed specifically to answer this practical question; and did, in the affirmative for one product and negative for the other three.

As to Samsung’s arguments that use of an “intermediary” foreign metal object to trigger the emission of the electromagnetic field is an improper “modification” (*see* RIB at 75-76), this is not persuasive. Use of such an object outside a reader is no more a modification than the use of metal in a magnetic read-head to trigger the emission during an inside-the-reader swipe. CX-0155C at *30 [REDACTED]

[REDACTED] Hr’g Tr. at 43:14-47:5. In this way, the device did exactly as it was intended to do. *See* RIB at 78 (citing *High Tech Med.*, 49 F.3d at 1555; *Hap Corp. v. Heyman Mfg. Co.*, 311 F.2d 839, 843 (1st Cir. 1962))). Moreover, the limitation makes it clear that it is “the circuit” which must be “operable.” 100 patent at cl. 1. No part of “the circuit” is modified by holding or waving a bottle opener, for example, next to the card.

Accordingly, practice of the limitation has been shown for the CIBC product, but no others.

2. Claim 6

For reference, claim 6 of the 100 patent requires:

6. The device of claim 1, further comprising a display operable to display a virtual card.

100 patent at cl. 6. For this claim, Dynamics argues it is practiced by the Emirates NBD “because it includes an E-ink display having a resolution of 256 x 256 pixels.” CIB at 54 (Citing CX-1199C at Q/A 95; CX-1198C at Q/A 82-83). In Dynamics’ reply brief, it adds that the display “is capable of displaying various graphics, including text representing a card number, cardholder’s name, and



graphics including a VISA or MasterCard logo, balloons, QR codes, buildings, and more.” CRB at 38-39 (CX-1199C at Q/A 95, 126; CX-1198C at Q/A 80-83). Samsung argues the Emirates NBD card only displays text and thus cannot meet the construction for “virtual card” as “visual representation of a payment card.” RIB at 79 (citing RX-1675C at Q/A 212-220); *see* RRB at 33.

The claim is not met. The simplest means to show practice would be an image of the Emirates NBD card displaying a virtual card in its 256x256 pixel display. Dynamics does not provide one, however. The testimony from Mr. Zatkovich reasoning why a “visual representation of a payment card” is *possible* given the complexity of other types of imagery which have been displayed (*see* CX-1199C at Q/A 95) is not sufficient. As discussed above, the claim language “operable to” in this claim requires the act to take place.

With that said, Mr. Zatkovich (not Dynamics) appears to opine, in a discussion of the 545 patent’s cellular network connectivity, that a “visual representation of a payment card” occurred on the display during the October 17, 2019 demonstration between counsel. CX-1199C at Q/A 126 (citing CX-0656C). He points to the 1:47 timestamp, reproduced below:



Id. (citing CX-0656C). This is not a “visual representation of a payment card” however. It is merely the salient information of a payment card in a customized arrangement, with no border lines or other markings to invoke the appearance of an object (card or otherwise). *Compare* CX-0656C *with* CX-1199C at Q/A 122.

Accordingly, no DI Product has been shown to practice claim 6 of the 100 patent.

3. Claim 8

For reference, claim 8 of the 100 patent requires:

8. The device of claim 1, wherein the circuit is operable to emit a second electromagnetic field.

100 patent at cl. 8. For this claim, Samsung generally argues domestic industry cannot be shown because no witness offered testimony on how it is met, in the Emirates NBD product or any other. Dynamics asserted practice of this claim in its pre-hearing brief (CPB at 94) but omitted any discussion in its post-hearing brief (*see generally* CIB; CRB).

Accordingly, no practice of claim 8 of the 100 patent has been shown.

F. Validity

Samsung identifies the following invalidity theories for the 100 patent:

Claims	Theory
1, 4, 8, 12, 18	Anticipated under 35 U.S.C. § 102(a) and (b) by VivoTech (RX-0881)
1, 4, 8, 12, 18	Anticipated under 35 U.S.C. § 102(a) and (b) by Doughty (RX-0283)
1, 4, 6, 12	Rendered obvious under 35 U.S.C. § 103 by VivoTech (RX-0881) and Kim (RX-0871), Pitroda (RX-0878), and/or Zellner (RX-0880)
1, 4, 6, 12	Rendered obvious under 35 U.S.C. § 103 by Doughty (RX-0283) and VivoTech (RX-0881)
1, 4, 6, 8	Lack of enablement 35 U.S.C. § 112, ¶ 2
1, 4, 6, 8, 12, 18	Invalid under 35 U.S.C. §§ 102(f), 116 due to incorrect inventorship

See generally RIB at 80-104; RRB at 34-49. U.S. Patent No. 7,114,652 (“VivoTech”) issued on October 3, 2006 and is prior art to the 100 patent under 35 U.S.C. §§ 102(a) and (b). RIB at 82; RX-0881. U.S. Pub. No. 2006/0161789 (“Doughty”) published on July 20, 2006, and is prior art to the 100 patent under 35 U.S.C. §§ 102(a) and (b). RIB at 88; RX-0283. Korean Utility Model No. 20-0287641 (“Kim”) published on August 30, 2002, and is prior art to the 100 patent under 35 U.S.C. §§ 102(a) and (b). RIB at 95 n.15; RX-0871. U.S. Patent No. 6,769,607 (“Pitroda”) issued on August 3, 2004, from an application filed on June 6, 2000, and is prior art to the 100 patent under 35 U.S.C. §§ 102(a) and (b). RIB at 95 n. 15; RX-0878. U.S. Patent No. 7,097,108 (“Zellner”) issued on August 29, 2006, from an application filed on October 28, 2004, and is prior

art to the 100 patent under 35 U.S.C. §§ 102(a) and (b). RIB at 96 n.16; RX-0880. Dynamics does not dispute that these references qualify as prior art. *See generally* CIB; CRB.

1. VivoTech

Samsung contends claims 1, 4, 8, 12, and 18 are anticipated by VivoTech, which “describes an adapter that uses magnetic emulation to communicate from outside of a magnetic stripe reader.” RIB at 82.

As for claim 1 and “a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader,” Samsung states, “Dynamics does not dispute that VivoTech discloses this element.” RIB at 83. Samsung points to VivoTech’s disclosure of a “magnetic field-generating element 70 aligned with Track 1 reader head 10a and Track 2 reader head 10b of device 2” (*id.* (citing RX-0881 at 5:25-29)), with that element itself including inner 74 and outer coils 76—*i.e.*, a circuit (*id.* at 83-84 (citing RX-0881 at 5:33-36, Fig. 2; RX-1677C at Q/A 130)). Samsung argues these coils “are operable to couple to and communicate data to a read-head of a magnetic stripe reader.” *Id.* at 84 (citing RX-0881 at 2:55-3:6, Abstract, 3:59-65, 6:49-7:9, 8:12-16; RX-1677C at Q/A 131).

As for “a processor for controlling the circuit,” Samsung first states “Dynamics did not dispute this limitation in its Pre-Hearing Brief, and so waived any such contention.” RIB at 84 (citing CIB at 95-96). As to its disclosure, Samsung points to VivoTech’s adapter which “contains ‘one or more . . . interface processors 24.’” *Id.* (citing RX-0881 at 4:41-43). Samsung argues these processors convert data received in one wireless format to the relevant ISO standard format for magnetic stripe readers (*id.* at 85 (citing, *inter alia*, RX-1677C at Q/A 134-136)), and, if it is not these processors specifically, one such processor performing that function must necessarily be present (*see id.* (citing RX-1677C at Q/A 137, 140)).



As for “wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head,” Samsung explains, “VivoTech describes ‘an adaptor positioned external to . . . the housing of the conventional magnetic stripe card reader device’ and that ‘the adaptor includes elements configured to emit a localized magnetic field of sufficient strength to communicate a signal through the housing to the head of the magnetic stripe card reader.’” RIB at 85 (citing RX-1677C at Q/A 148-160; RX-0881 at 4:59-65, Abstract, 2:55-3:6, 3:36-38, 5:25-29, 6:43-48, 8:1-16, Figs. 3A-4B; Hr’g Tr. at 806:20-24, 813:7-18, 802:2-11). Samsung notes the particular quarter of an inch requirement would have been a standard thickness of card reader housings in the 2005 to 2006 timeframe. *Id.* at 86 (citing RX-1677C at Q/A 148-151; Hr’g Tr. at 832:12-16; 100 patent at 8:35-39).

Samsung has shown anticipation of claim 1 by VivoTech by clear and convincing evidence as alleged above. The central thrust of VivoTech is not the mere use of an electromagnetic field to emulate the swiping of a magnetic stripe payment card, but performing that emulation from outside the card reader so as to avoid the “reluctance of merchants to replace their existing POS card acceptance systems.” RX-0881 at 2:40-42, Figs. 1, 3A-4B. This is also the only potentially distinctive feature of claim 1 of the 100 patent. *See* 100 patent at cl. 1.

Dynamics’ opposition is rooted in treating the preamble, “a device,” as limiting. *See* CIB at 56 (emphasizing “a device” must be limiting), 57 (“VivoTech does not meet the limitations of claim 1 because it teaches an adapter that becomes part of the merchant’s reader, and thus does not operate outside the reader. . . . Moreover, VivoTech is not a device because VivoTech is a system formed from a consumer device and a merchant device that communicate with each other. . . . Because VivoTech does not disclose a standalone device that operates from outside the



card reader, it does not anticipate claim 1”); CRB at 41 (“discloses a system in which one of the components becomes part of the merchant’s reader, and does not teach a standalone device operable to communicate from outside a reader, as required by claim 1.”). As determined above, however, “a device” is not limiting, so it does not distinguish prior art that otherwise clearly teaches every element of the claim.

Accordingly, Samsung has shown that VivoTech anticipates claim 1 of the 100 patent.

As for claim 4 and “wherein the device is a portable telephonic device,” Samsung contends “[t]he claim does not limit the ‘portable telephonic device’ to a single physical object” and “the combination of VivoTech’s adapter and the cellular phone shown in Figure 1, which together communicate payment data to a magnetic stripe reader, is a device.” RIB at 86-87. Thus, the combined device includes a portable telephone and is thus “a portable telephonic device.” *Id.* at 87.

Here, Samsung is not persuasive. VivoTech teaches an adapter that sits between a traditional merchant card reader and a customer’s portable electronic device. *See, e.g.*, RX-0881 at Figs. 1, 3A-4B, Abstract, 3:55-65. VivoTech does not teach an adapter integrated into the portable electronic device, or vice versa; and just as Samsung has argued the adapter does not become part of the card reader when placed adjacent thereto (*see* RRB at 34-35; RX-0881 at Fig. 1), the customer’s cellphone does not become part of the adapter when it is placed on the adapter’s “C-pod” (*see* RIB at 87; RX-0881 at 4:8-15, Fig. 1). Rather, the card reader and portable electronic device are the environment in which the adapter is expected to function. *See Silicon Graphics*, 607 F.3d at 795 (holding that a Microsoft Windows operating system, otherwise necessary for rasterizing under the claim limitation “processor that rasterizes,” was simply part of the environment for accused software to operate).

Accordingly, Samsung has not shown that VivoTech anticipates claim 4 of the 100 patent.

As for claim 8 and “wherein the circuit is operable to emit a second electromagnetic field,” Samsung claims “[t]his element is undisputed.” *See* RIB at 87. VivoTech includes two coils 74 and 76 which emit separate electromagnetic fields of varying strength. *See id.* (citing RX-0881 at 6:49-7:2, 5:33-36; CX-1204C at Q/A 81). Dynamics does not, in fact, dispute this. *See* CIB at 60; CRB at 41.

Accordingly, Samsung has shown that VivoTech anticipates claim 8 of the 100 patent.

As for independent claim 12, the parties effectively treat it the same as independent claim 1, with Dynamics’ opposition again based on treating the preamble as limiting. CIB at 61 (“The only difference between claim 1 and claims 12, other than removing the one-quarter inch element from the read-head requirement, is that claim 12 is directed to a portable telephonic device.”); CRB at 41; RIB at 87-88; RRB at 38. And again, as determined above, the preamble is not limiting.

Accordingly, Samsung has shown that VivoTech anticipates claim 12 of the 100 patent.

As for claim 18 and “further comprising a second circuit operable to emit a second electromagnetic field,” it is present in VivoTech, based on the inner 74 and outer coils 76 discussed above in connection with claim 8. RIB at 88 (citing RX-0881 at 5:33-36, 6:49-72). Dynamics does not dispute this. *See* CIB at 61; CRB at 41.

Accordingly, Samsung has shown that VivoTech anticipates claim 18 of the 100 patent.

2. Doughty

Samsung contends claims 1, 4, 8, 12, and 18 are anticipated by Doughty, which “describes, among other things, integrating a magnetic emulator into a telecommunication device.” *See* RIB at 88-95.

As for claim 1 and “a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader,” Samsung first

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asserts “Dynamics did not dispute this element in its Pre-Hearing Brief.” RIB at 88 (citing CPB at 96). Samsung points specifically to Doughty’s disclosures of a magnetic field generator meant to emulate the signal from a swiped magnetic stripe card. *See id.* at 88-90 (citing, *inter alia*, RX-0283 at [0010], [0053], [0040]; RX-1677C at Q/A 232-233).

As for “a processor for controlling the circuit,” Samsung also claims this element is “not disputed” in Doughty. RIB at 90 (citing CPB at 96). Samsung points to a “control circuit 554,” as to which Doughty discloses “may be part of the device processor.” *Id.* (citing RX-0283C at [0053], Fig. 5B; RX-1677C at Q/A 234-235).

As for “wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head,” Samsung points to Doughty’s disclosures of its emulator integrated into personal communication devices and other items such as jewelry, watches, key rings, and the like, and reasons:

[T]hat, in order for Doughty’s magnetic field generator to be integrated into such objects and devices, the magnetic field generator must necessarily be capable of communicating data to a read-head from outside of a magnetic stripe reader, as many of the personal objects and devices described by Doughty, such as rings, watches, eye glasses, PDAs and cellular phones cannot fit inside the trough of a magnetic stripe reader.

Id. at 91 (citing RX-1677C at Q/A 236); RRB at 38 (citing RX-0283 at [0008], [0010], [0021], [0040], [0048], [0053]-[0054], Fig. 5B); *id.* at 38-39 (“But while Doughty certainly discloses swipeable embodiments such as a card embodiment, it also discloses non-swipeable embodiments, as discussed above.”). According to Samsung, if these devices integrated with magnetic emulators cannot fit within the trough of a card reader, they must “be capable of communicating data to a read-head from a distance of at least a quarter of an inch from the read-head.” RIB at 91 (citing RX-1677C at Q/A 237).



Samsung has met its burden on all but the last limitation. It is undisputed that Doughty does not explicitly disclose outside-the-reader communication with a magnetic stripe card reader read-head. Rather, Samsung pieces together a variety of disclosures to infer this feature is taught, essentially under an inherency theory. Specifically, Samsung points to a magnetic field generator placed on a “device,” along with many other communicative features/protocols, with that “device” then “integrated” into any number of portable items such as “a personal communication device, such as a personal data assistant (PDA), a telecommunications device, a pager, a computer and an electronic mail transceiver . . . a personal device/belonging, such as a watch, a jewelry, a key ring, a tag and eye glasses, etc.” RX-0283 at [0048]. Then, based on commonly understood dimensions of those items, Samsung asserts they would not fit within the trough of a card reader for swiping. RIB at 90-91; RX-1677C at Q/A 236. Thus, according to Samsung, the non-swipeable nature of these items must mean the magnetic field generator (through its inclusion in the “device”) functions from an outside-the-reader position, thereby satisfying the limitation. RIB at 90-91; RRB at 38-41; RX-1677C at Q/A 236.

The central problem with Samsung’s theory is that when Doughty actually describes the details of its magnetic field generator, it does so with two competing embodiments: spatial-based encoding of a programmable magnetic stripe, and a time-varying magnetic signal. *See* RX-0283 at [0010], [0040], [0043], [0052], [0053], Figs. 5A, 5B. It is undisputed that the former must be swiped through a card reader as with a traditional payment card (CIB at 58; RX-0283 at [0054]; *see* RRB at 38-39), and Doughty *expressly* discloses the latter as being *designed* for inside-the-reader operation both in terms of signal composition and coil placement:

Now referring to FIG. 5B, a block diagram of a programmable magnetic stripe 550 (308 FIG. 3) using a single induction coil 552 for sending emulated time-varying magnetic stripe data to a magnetic card reader directly from the on-card controller in accordance with another embodiment of the present invention is shown. The



programmable magnetic stripe 550 (308 FIG. 3) includes a magnetic stripe 502, a single inductive coil 552 and a control circuit 554. The magnetic stripe 502 contains one or more sets of magnetic data cells 504-516. For example, magnetic stripe 502 will typically contain three tracks or sets of magnetic data cells 504-516. The long inductive coil 552 is mounted immediately beneath the entire length of the magnetic stripe 502 and its corresponding binary magnetic data cells 504-516 such that a time-varying signal can be transmitted to the heads of the magnetic card reader *as the card is swiped through the reader. The data rate is determined based on the minimum and maximum swipe speeds that standard readers can accommodate. In other words, the single inductive coil 552 is long enough for it to be in the physical proximity of the card reader heads for the entire time period required to transmit the time-varying signal from the card to the card reader.* The inductive coil 552 is electrically connected to the control circuit 554, which may be integrated into the device processor 314 (FIG. 3). By establishing the configuration in this manner, the inductive coil 552 can be pulsed with varying currents and current directions so that the time-varying data stream of a card being swiped through the reader is emulated, thus providing the same magnetic data stream to the reader heads of the magnetic stripe reader as would be seen if a card with binary data in multiple spatially distributed data cells 504-516 in the magnetic stripe 502 were swiped through the reader. This magnetic signal will, therefore, emulate the data that would be generated by the swipe of a magnetic stripe card with the desired information embedded in the individual data cells 504-516 of the stripe 502.

RX-0283 at [0053] (emphasis added); CIB at 59. In view of this passage, it cannot be said Doughty clearly and convincingly teaches “wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head,” either expressly or inherently. *Guangdong*, 936 F.3d at 1364 (“An element may be inherently disclosed only if it is ‘necessarily present,’ not merely probably or possibly present, in the prior art.”).

Additionally, both Dynamics and Samsung point out enablement issues with the other’s proposed embodiments that are not completely without merit. *See, e.g.*, CIB at 59 (“Mere statements that Doughty’s substrate may be included in a cell phone, jewelry or key ring fail to explain how Doughty’s swipeable programmable magnetic stripe can be implemented in a cell phone, jewelry or key ring that are not apparently swipeable through the magnetic readers.”); RRB at 41 (“Dynamics argues that Doughty must use a swipeable extension, similar to that disclosed

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by Pitroda. . . Dynamics never explains how it would even be possible to incorporate an extension having the length of a magnetic stripe into something like a key ring or a pair of eyeglasses. Nor does Dynamics explain how one would swipe something as large as a computer at a POS terminal . . .”). All of these, however, are overshadowed by Doughty’s complete lack of suggestion that its time-varying magnetic field could be used in ways other than swiping—a point all the more surprising given a discussion of an unidentified VivoTech product in the background of the art. RX-0283 at [0005].

Accordingly, Samsung has not shown that Doughty anticipates claim 1 of the 100 patent, nor, due to their dependency, claims 4 and 8. As to independent claim 12, the parties largely treat it the same as independent claim 1. CIB at 61; RIB at 94; *see* CRB at 41-43. Accordingly, Samsung has not shown that Doughty anticipates claim 12 of the 100 patent, nor, due to its dependency, claim 18.

3. VivoTech in combination

Samsung contends claims 1, 4, 6, and 12 are obvious in light of VivoTech and various other references. *See* RIB at 95-99. Anticipation is the “epitome of obviousness,” so claims 1 and 12 are necessarily obvious in view of VivoTech. *In re Kalm*, 378 F.2d 959, 962 (C.C.P.A. 1967).

As to claim 4, “wherein the device is a portable telephonic device,” Samsung argues “Mr. Lipoff explains that it would have been obvious to incorporate the functionality described by VivoTech into a portable telephonic device in view of U.S. Patent No. 7,097,108 (‘Zellner’) and/or Pitroda.” RIB at 96 (RX-1677C at Q/A 162-178). More specifically, Samsung argues “Pitroda in particular shows that a POSITA would have understood there are two general approaches, the standalone adapter used by VivoTech, and the approach of putting an emulator directly into a phone, obviating the need for an adapter.” *Id.* (citing RX-1677C at Q/A 167); *see id.* at 96-97 (citing RX-0878 at 2:3-6, 4:37-52, 7:23-25, 11:11-39, Figs. 20, 21). The latter, according to

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Samsung, provides the benefit of not needing to rely on a merchant to have acquired VivoTech’s adapter, and would be “the mere application of a known technique to a piece of prior art ready for the improvement.” *See id.* at 96-97 (citing RX-1677C at Q/A 167-169; *KSR*, 559 U.S. at 417). Aside from Pitroda, and in response to argument from Dynamics, Samsung disputes that Zellner “discloses an encoder that programs a separate card, not an emulator.” *Id.* at 97 (citing RX-0880 at 5:35-39).

The evidence does not rise to a clear and convincing case of obviousness. Although the scope and content of the prior art discloses the various elements of claim 4, Samsung has not provided a persuasive benefit or motivation to include the magnetic emulator of VivoTech—designed to communicate while outside a card reader—with a portable telephone. Samsung argues “a POSITA would have been motivated to make such a modification so that a customer who desired to use his or her portable telephonic device to complete payment transactions would not need to rely on a merchant having purchased VivoTech’s adapter.” RIB at 96. But Pitroda’s device already solves this problem by combining a magnetic emulator with the customer’s personal electronic transaction device (*e.g.*, a wireless telephone). *See, e.g.*, RX-0878 at 1:42-55 (“RF proximity chip cards are slowly replacing the magnetic stripe card for use in financial transactions”), 3:21-48 (“One potential hurdle for the widespread adoption of electronic transaction devices such as Universal Electronic Transaction Cards and similarly configured PDA’s and wireless telephones is compatibility with the existing infrastructure of magnetic card readers.”). Pitroda also allows for independence from merchant equipment by placing the emulator in a “reader insertable portion” of the device housing (*i.e.*, not outside-the-reader communication). RX-0878 at 3:57-59, 4:37-52, Fig. 2. To the extent Zellner also discloses integrating a magnetic emulator with wireless telephone, it too already solves the problem. Samsung’s briefing mentions

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no other possible benefits or motivations to make the combination. *See* RIB at 96-97; RRB at 42-43.

Mr. Lipoff, Samsung's expert, opines "if VivoTech's magnetic field-generating element were integrated into a cellular phone, a customer who wanted to use the phone to complete payment transactions would not need to rely on a merchant having purchased VivoTech's adapter." RX-1677C at Q/A 168. Again, this problem—relying on merchant infrastructure—is already solved by Pitroda and Zellner. Their portable, personal electronic devices bring magnetic emulation with them.

Mr. Lipoff also offers, "VivoTech describes a standalone adapter because that was the business of VivoTech, Inc. But a POSITA reading VivoTech would have realized that putting the emulator directly into a phone is a viable and potentially better alternative, particularly if you are in the cell phone business." RX-1677C at Q/A 173. A "potentially better alternative" is exceptionally vague and not particularly probative or persuasive.

Mr. Lipoff further testifies "[t]he cell phone disclosed by VivoTech already had the ability to communicate payment card information using various wireless protocols. Providing it with the additional ability to communicate directly with magnetic stripe readers, without the need for an adapter, expands the utility of this payment functionality and the number of places where it can be used." RX-1677C at Q/A 174. Again, communicating directly with a magnetic stripe reader without the need for a merchant adapter is already covered by Pitroda and Zellner.

So there is a crucial gap between the claimed invention and the prior art: a reason for a person of ordinary skill to incorporate, specifically, VivoTech's outside-the-reader magnetic emulation capabilities into a cellular phone (RX-1677C at Q/A 178) that already has a swipeable emulator as in Pitroda and Zellner. A clear and convincing case of obviousness cannot be made

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without closing this gap. *KSR*, 550 U.S. at 399 (“The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor.”).

Testimony or other evidence showing that a POSITA might view the emulator adapter of Pitroda as deficient for some reason (*e.g.*, appearance, technical feasibility, information security, etc.) could supply the missing piece, but none is cited for this theory. Indeed, the benefit which VivoTech attributes to its outside-the-reader communication (outside-the-reader communication leaves the card reader slot open for other customers’ conventional cards) would not apply to Samsung’s proposed combination:

In accordance with one embodiment of the present invention, the adaptor includes an inductor capable of generating a magnetic field of sufficient power to couple with a head of a magnetic stripe card reader through the housing of the reader device. In this manner, the adaptor can be positioned external to the reader device, *leaving the slot of the reader accessible for conventional interactions with magnetic stripe cards.*

RX-0881 at Abstract (emphasis added);

An adaptor in accordance with the present invention allows a conventional magnetic stripe card POS reader to receive information from contact-based or wireless sources *while maintaining the concurrent ability of the reader to interact with a magnetic stripe card.* In accordance with one embodiment of the present invention, the adaptor includes an inductor capable of generating a magnetic field of sufficient strength to couple through the housing of the reader device, with a head of a magnetic stripe card reader. Selective inductive communication with individual heads of the reader device may exploit their differing sensitivity to external magnetic fields generated by the adaptor. In this manner, the adaptor can be positioned external to the reader device, *leaving the slot of the reader accessible for conventional interactions with magnetic stripe cards.*

id. at 2:51-65 (emphasis added);

An adaptor in accordance with the present invention allows a conventional magnetic stripe card reader to interact with other media such as RF proximity chip cards and Infra-Red *while retaining the continuous ability to receive a magnetic stripe card.* In accordance with one embodiment, the adaptor includes an adaptor positioned external to, and affixed to the housing of, the conventional magnetic stripe card reader device. The adaptor includes elements configured to emit a

localized magnetic field of sufficient strength to communicate a signal through the housing to the head of the magnetic stripe card reader.

id. at 3:55-65 (emphasis added).

Admittedly, the secondary evidence of non-obviousness has only a weak nexus to the claims. *See* CIB at 65-68; RRB at 46. According to Dynamics, the crucial element supporting such secondary evidence is “communicat[ing] the data . . . while located outside of the magnetic stripe reader,” but testing of that feature was only successful using a single card and a single reader, and only for one track of data, and required an adjacent bottle opener. *See* RX-1675C at Q/A 202-203; RDX-1065C. Nonetheless, considering all the *Graham* factors, Samsung has not demonstrated the obviousness of claim 4.

As to claim 6, requiring “a display operable to display a virtual card,” Samsung argues it was well known in 2008 and is expressly disclosed in both Zellner and Pitroda. *See* RIB at 98 (citing RX-1677C at Q/A 179-188; RX-0880 at 10:63-11:8, 1:53-59, 2:35-43, 2:53-59, 6:1-8, 7:17-21, Figs. 2A, 3A, 12; RX-0878 at 2:11-17, 1:55-59). Samsung continues, “a POSITA would have been motivated to combine these teachings from Zellner or Pitroda with VivoTech, as such images would make it easier for users to identify and select the right card for a particular transaction, and that such a combination was within the skill of [a] POSITA and would yield predictable results.” *Id.* (citing RX-1677C at Q/A 182-184; KSR, 550 U.S. at 416).

Samsung’s theory is not persuasive, largely because the scope and content of the prior art do not clearly teach all claim elements. Although VivoTech discloses a “display region 21” on its “C-pod portion 16” (RX-0881 at 4:28-40), Samsung does not allege it would have been obvious to display a virtual card there. Instead, Samsung argues it would have been obvious “to display virtual cards on the display *of the cellphone*” which a customer would place upon the C-pod to initiate a transaction. RIB at 98 (emphasis added); RX-1677C at Q/A 183; *see* RX-0881 at Fig. 1.



Doing so would not meet claim 6, however, because the claimed “device” is the VivoTech adapter—and not the cellphone or card reader. It bears repeating that just as Samsung argues the adapter does not become part of the card reader when placed adjacent thereto (*see* RRB at 34-35; RX-0881 at Fig. 1), the customer’s cell phone does not become part of the adapter when it is placed on the “C-pod” (*see* RIB at 87; RX-0881 at 4:8-15, Fig. 1). These are merely the features of the environment in which VivoTech is expected to operate.

As an alternative, Samsung contends the combination can also be considered as “a cellphone that has been integrated with VivoTech’s magnetic field-generating element.” RIB at 98; RX-1677C at Q/A 183. This approach seems to assume claim 4 (“wherein the device is a portable telephonic device”) has already been accepted. As determined above, however, Samsung has not shown with clear and convincing evidence that it would have been obvious to put VivoTech’s outside-the-reader emulator in a portable electronic device.

So the scope and content of the prior art fall significantly short of demonstrating obviousness, and there are substantial differences between the claimed invention and the prior art. And although, again, the secondary indicia of non-obviousness lack a solid nexus to the claims, overall Samsung has not shown the obviousness of claim 6 by clear and convincing evidence.

4. Doughty in combination

Samsung contends claims 1, 6, and 12 are obvious in light of Doughty in combination with various other references. *See* RIB at 99-102; RRB at 44-46. Although Samsung tersely asserts that “to the extent claim 1 is obvious” in view of Doughty combined with other references, “so is claim 4,” this assertion only appears in its reply brief. RRB at 45. Dynamics therefore did not have an opportunity to rebut it, and it will not be considered further.

With respect to claim 1, the scope and content of the prior art are noteworthy, because Doughty discloses all limitations except outside-the-reader communication. Samsung argues that,

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for Doughty, “the only thing necessary to communicate with a read-head from outside the reader is a strong enough magnetic field,” which is a simple matter of increasing the supplied current. RIB at 99-100 (citing, *inter alia*, RX-1677C at Q/A 50-56, 244; Hr’g Tr. at 796:7-10); RRB at 44-45. Samsung further argues “it would have been obvious to incorporate the functionality of VivoTech’s magnetic field-generating element in Doughty’s devices so that they do not require a swipeable or insertable extension.” RIB at 100 (citing RX-1677C at Q/A 245-247). Additionally, Samsung disputes that Doughty’s discussion of a VivoTech product amounts to teaching away, as its disparagement was focused on the standalone adapter-aspect of VivoTech, not the outside-the-reader capability. *Id.* (citing RX-0283 at [0005]); RRB at 45.

Samsung has established a clear and convincing case of obviousness. Doughty discloses that its magnetic field generator 208 “can be mounted on the substrate or disposed within the substrate” of a device 302, which itself “may be integrated into a personal communication device, such as a personal data assistant (PDA), a telecommunications device, a pager, a computer and an electronic mail transceiver, etc.” (RX-0283 at [0048]); and while Doughty only teaches swiping its magnetic emulator coil inside the reader, its background discussion of VivoTech would inform or at least lead a person of ordinary skill in the art to VivoTech’s outside-the-reader communication using the same coil (RX-0283 at [0053]; RX-0881 at 5:32-53).

Importantly, and unlike the discussion of obviousness with VivoTech as the base reference, Samsung has provided a motivation for incorporating VivoTech’s outside-the-reader communication into the personal communication device of Doughty. Samsung argues “it would have been obvious to incorporate the functionality of VivoTech’s magnetic field-generating element in Doughty’s devices so that they do not require a swipeable or insertable extension.” RIB at 100 (citing RX-1677C at Q/A 245-237). This is persuasive on its own (*see, e.g.*, RX-0878 at

Fig. 20) and further supported by Doughty's disparagement of use of an adapter between a customer's personal device and the merchant:

Similarly, one developer, ViVOTech, Inc., places a fixed bridge in the magnetic stripe reader that is capable of receiving radio frequency ("RF") data and then emulates the feed of data into the magnetic stripe reader via RF to complete the transaction without requiring physical contact of the card with the reader. Both of these technologies require either a fixed or mobile adaptor to be added to the card-reader infrastructure to enable data to be read from the card. While this is possible, it is still a modification to the world-wide infrastructure that is undesirable for unfettered use of the card. The use of such a bridge is cumbersome, adds cost and reduces reliability. In addition, this method also does not incorporate authentication of the user to provide protections against skimming or use by unauthorized individuals.

RX-0283 at [0005]. After all, the point of VivoTech is to show how to communicate with a standard magnetic stripe card reader without having to use the card swipe trough. RX-0881 at 2:51-65. Thus, there is a clear motivation to make the combination.

There can also be no real debate that it would have been within the ordinary skill of a person in the art. Both parties' experts effectively admit that increased current applied to the coil is mostly what is needed to create the requisite time-varying electromagnetic signal. RX-1677C at Q/A 50-56, 244; *see* Hr'g Tr. at 795:10-801:20). While it is true Dynamics' expert, Mr. Zatkovich, qualified his response with "[y]es, and to the extent that that is only one of several factors needed to successfully transmit card data outside of a reader" (Hr'g Tr. at 801:8-10), he does not mention what those factors might be or claim they are outside the skill of an ordinary person in the art. 19 C.F.R. § 210.37(a) ("The proponent of any factual proposition shall be required to sustain the burden of proof with respect thereto."). VivoTech itself explains how communicating between more and less sensitive read-heads from outside a reader is simply a matter of creating more and less powerful magnetic fields. *See* RX-0881 at 6:49-7:27.

Dynamics' other points of opposition are not persuasive. The topic is not addressed at all in its initial brief. *See* CIB at 64. In its rebuttal, Dynamics refers to a U.S. Patent Office Notice

[REDACTED]

of Allowance (*see* CRB at 44 (citing “Notice of Allowance at 2-3”); *id.* at 40 (citing EDIS Doc. ID 727694)) which is not in the record. Dynamics also views Doughty as teaching away from outside-the-reader communication. *Id.* at 44 (citing, generally, RX-0283). Not so. As explained, Doughty criticizes use of an inter-device adapter, not outside-the-reader communication. RX-0283 at [0005].

Dynamics’ discussion of secondary considerations of non-obviousness do not disturb the above findings. Dynamics contends the commercial success of its own products is due to their “primary feature” of communicating outside the reader (CIB at 65), yet the cited evidence consists of testimony from its technical expert, Mr. Zatkovich, simply repeating this point and then the 100 patent itself (*see id.*). Moreover, as noted, outside-the-reader communication involves the kludge of the claimed invention combined with a nearby metal object, and is hardly a “primary” feature that led to any kind of commercial success. There is simply no merit to Dynamics’ claim that “[t]his feature is key to Dynamics’ success” (CIB at 66), nor to the claim that Samsung’s massive phone sales evidence the same (*id.* (citing CX-1204C at Q/A 147)).

Dynamics’ reference to the licensing of its entire patent family fares similarly, with no demonstrated connection to outside-the-reader functionality. CIB at 65 (citing, *inter alia*, CX-1197C at Q/A 52-54). For example, Dynamics argues it [REDACTED]

[REDACTED] *Id.* at 66 (citing CX-1203C at Q/A 36). But, as noted, this is inconsistent with the technical prong evidence of record, nor is it clear why a practical demonstration would be needed to incentivize licensing this patent.

Dynamics’ claims of long felt need (*see* CIB at 66-67) are similarly unpersuasive. Dynamics refers to testimony from Mr. Zatkovich, who cites but does not discuss various news

[REDACTED]

articles. *Id.* (citing CX-1204C at Q/A 149-151; CX-0299; CX-0300; CX-0301; CX-0302; CX-0303; CX-0304). A review of the first three (CX-0299; CX-0300; CX-0301) reveals no discussion of outside-the-reader communication, except for technical FAQ on the accused apparatus from Samsung, and certainly no suggestion of long felt need. And again, Dynamics’ claim that the 100 patent solved the need because Dynamics “developed devices that emit a magnetic field strong enough to communicate successfully with a read-head both within and from outside a card reader” (CIB at 67 (citation omitted)) is dubious given the technical prong evidence of record.

Dynamics’ claims of praise by others and copying are not persuasive for the same reasons. That Dynamics’ products have not been shown to reliably communicate outside-the-reader (RX-1675C at Q/A 202-204; RDX-1065C), and even have to be “tricked” into operating this way with a foreign piece of metal (Hr’g Tr. at 41:22-42:11), seriously undercuts any idea that the products were copied or praised for their outside-the-reader abilities. Indeed, Dynamics does not even allege that the copying or praise was for this ability—as opposed to its magnetic emulation technology generally. *See* CIB at 67-68.

Accordingly, in view of the *Graham* factors Samsung has shown claim 1 of the 100 patent to be obvious in light of Doughty in combination with VivoTech.

As for claim 6, requiring, “a display operable to display a virtual card,” Samsung argues the types of personal communications devices disclosed in Doughty, and which would contain the magnetic field generator, included PDAs and cellphones—known to “easily display virtual cards, and it would have been obvious to use them for that purpose” in light of prior art references Zellner and Pitroda. RIB at 100-101 (citing, *inter alia*, RX-1677C at Q/A 253-257; RX-0283 at [0048]; RX-0880 at 1:53-59, 2:35-43, 2:53-59, 6:1-8, 7:17-21, 10:63-11:8, Figs. 2A, 3A, 12; RX-0878 at 1:55-59, 2:11-17); RRB at 45-46. As for motivation, Samsung contends “such images would make

[REDACTED]

it easier for users to identify and select the right card for a particular transaction,” and would constitute a predictable result. RIB at 101 (citing RX-1677C at Q/A 182-184, 255-256).

Samsung has shown the obviousness of claim 6, principally because the differences between the claimed invention and the prior art are minimal. Zellner, for example, shows the limitation clearly in the display of a personal communications device, such as that described in Doughty. RX-0880 at Fig. 12, 4:5-7 (“Fig. 12 illustrates a personal digital assistant including a full size credit card image according to various embodiments of the present invention.”). Samsung’s expert, Mr. Lipoff, has also provided a persuasive motivation to include this feature in a personal device with an outside-the-reader magnetic emulator; namely, it makes it easier to identify which card is being used for a particular transaction as if the user was “leafing through cards in their wallet.” RX-1677C at Q/A 182. Additionally, Zellner itself discloses the images can be used in circumstances “where a clerk or other individual obtains credit card information from the image of the credit card” or “where the image of the credit card and/or magnetic stripe information is used to obtain credit card information by a card reader.” *See generally* RX-0880 at 6:27-50.

Dynamics’ opposition is either misplaced (CIB at 64 (arguing Doughty does not disclose a sophisticated enough display)) or incorrect (*id.* (arguing Zellner does not teach a display as recited at all); *id.* at 64-65 (arguing Zellner does not teach emulation through a magnetic field and thus would not be combined); *see* CRB at 45). Further, the secondary considerations of non-obviousness presented by Dynamics are not tailored to claim 6, and as noted lack nexus even to claim 1, and are thus of little probative value. *See* CIB at 65-68; CRB at 45; *In re GPAC*, 57 F.3d at 1580; *Merck*, 808 F.3d at 837.

Accordingly, Samsung has shown claim 6 of the 100 patent to be obvious in light of Doughty, VivoTech, and Zellner.

As for independent claim 12, and its outside-the-reader limitation, Samsung refers to its discussion of claim 1. RIB at 101; RRB at 46. As determined above, Samsung has presented a clear and convincing case of obviousness for this limitation and claim. Dynamics does not discuss the claim in either of its briefs, apparently relying on its discussion of claim 1. *See* CIB at 62-68; CRB at 43-45.

Accordingly, Samsung has shown claim 12 of the 100 patent to be obvious in light of Doughty and VivoTech.

5. 35 U.S.C. § 112, ¶ 2 (Enablement)

Samsung advances a theory of invalidity under 35 U.S.C. § 112 for lack of enablement against claims 1, 4, 6, and 8. RIB at 102. Samsung contends the distance element in the limitation “wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the portable telephonic device” “has no upper bound,” and both parties’ experts agree the specification does not enable a person of ordinary skill to achieve the entire claimed range. *Id.* (citing CX-1204C at Q/A 119-120; RX-1677C at Q/A 360-364); RRB at 48-49. In fact, Dynamics’ expert does not concede this point, and instead persuasively argues those of ordinary skill would understand the environment in which card readers are used is less than several feet (because, for instance, nobody pays from across a room). CX-1204C at Q/A 120. That is, even assuming that Samsung’s enablement challenge presents a question of claim construction, the claims are not so open-ended that they encompass operation “miles from the read-head,” as Samsung’s expert assumes. RX-1677C at Q/A 362 (citing 100 patent at 2:2-6); *see Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1376-77 (Fed. Cir. 2007) (citing *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927

[REDACTED]

F.2d 1565, 1572 (Fed. Cir. 1991) (“Open-ended claims are not inherently improper; as for all claims their appropriateness depends on the particular facts of the invention, the disclosure, and the prior art. They may be supported if there is an inherent, albeit not precisely known, upper limit and the specification enables one of skill in the art to approach that limit.”)). Nor does Samsung even bother to address the *Wands* factors. *See* 585 F.2d at 737; RIB at 102; RRB at 48-49.

Accordingly, the claims of the 100 patent have not been shown to be invalid for lack of enablement.

6. 35 U.S.C. §§ 102(f), 116 (Improper Inventorship)

Finally, for the 100 patent, Samsung argues “[t]he ’100 patent is invalid and unenforceable under 35 U.S.C. §§ 102(f) and 116 due to incorrect inventorship” for improperly naming Bruce Cloutier as an inventor. RIB at 102-103 (citing, *inter alia*, *Gemstar-TV Guide Int’l, Inc. v. Int’l Trade Comm’n*, 383 F.3d 1352, 1381 (Fed. Cir. 2004)). Samsung contends that Mr. Cloutier “testified unequivocally that he was not an inventor of any of the claims of that patent” (*id.* at 103 (citing RX-0006C at 114:12-18, 117:20-118:10, 127:5-10, 129:7-17, 129:24-130:8, 133:3-21, 166:14-17; 62:6-20, 115:14-16, 116:25-117:8); RRB at 49), and that certain applications filed by Dynamics without his name corroborate that testimony (RIB at 103 (citing RX-1617 at [0003]; RX-1618 at [0020]-[0021]; RX-0894 at [0009], [0026], [0120])).

Samsung has not met its clear and convincing burden to show misjoinder. *Vanderbilt Univ. v. ICOS Corp.*, 601 F.3d 1297, 1305 (Fed. Cir. 2010) (“Our precedent has long required proof of misjoinder or nonjoinder of co-inventors by clear and convincing evidence”). The law does not require a co-inventor to have contributed to every claim in a patent, or even every limitation in a single claim. Rather, a co-inventor need only contribute to the conception of a portion of any claim. *Gemstar-TV Guide Intern., Inc. v. Int’l Trade Comm’n*, 383 F.3d 1352, 1381-82 (Fed. Cir. 2004).

[REDACTED]

So Samsung faces the burden of proving a negative: that Cloutier did not contribute to the conception of any claim of the 100 patent. Samsung does not even attempt this. *See* RIB at 102-04; RRB at 49. Rather, it relies principally on the transcript of Mr. Cloutier's deposition, where he was questioned, on a claim-by-claim basis, as to his contributions. *See* RX-0006C at 105:10-127:10.

To be sure, Mr. Cloutier testified at his deposition that it was his subjective belief he was not an inventor of any of claims 1-20. *See id.* But this does not mean his subjective belief was correct, and in *Solomon v. Kimberly-Clark Corp.*, the Federal Circuit explained why such deposition testimony should be scrutinized with caution:

Although we understand Kimberly-Clark to contend that the claims are invalid under section 102(f) either because Solomon is simply not the true inventor and thus should not be named on the patent, or that someone else (Kimberly-Clark suggests Solomon's patent attorney) invented the claimed invention and should have been joined but was not, both of Kimberly-Clark's assertions fail for the same reason: Kimberly Clark relied entirely on Solomon's lack of precision in defining her invention in the course of her deposition and the DX13 prototype, rather than introducing clear and convincing evidence that someone else was the true inventor. While an inventor's statements made during the course of litigation might in some circumstances justify a court in concluding that the named inventor "did not himself invent the subject matter sought to be patented," 35 U.S.C. § 102(f), it would require much stronger evidence that the named inventor was not the true inventor to justify a conclusion of clear and convincing evidence of invalidity.

216 F.3d 1372, 1381-82 (Fed. Cir. 2000).

Samsung relies on two provisional applications and one non-provisional publication filed before Mr. Cloutier joined Dynamics to corroborate his testimony. *See* RIB at 103 (citing RX-1617 at [0003]; RX-1618 at [0020]-[0021]; RX-0894 at [0009], [0026], [0120]); *see generally* RRB at 49. Samsung does not explain the contents of these documents, however, beyond simply observing that they do not list him as an inventor, nor do they map them to any claim limitations of the 100 patent. *See* RIB at 102. And it is hardly surprising that Mr. Mullen was unable to name

[REDACTED]

a single contribution from Mr. Cloutier (RIB at 103; citing CX-1197C at Q/A 35), given the relevant events transpired over ten years ago. *See* RX-0006C at 18:16-22.

Accordingly, Samsung has not shown, by clear and convincing evidence, invalidity of any claim of the 100 patent for improper inventorship.

VI. U.S. PATENT NO. 10,223,631

A. Level of Ordinary Skill in the Art

A person having ordinary skill in the art of the 631 patent at the time of invention “would have: an undergraduate degree in computer science, electrical engineering, or the equivalent (including computer engineering) and at least three years of experience with point of sale systems and the use of magnetic fields to convey information.” Order No. 7 at 7.

B. Claims-at-Issue

Claims 1, 4, 6, and 22 of the 631 patent are at issue in this investigation, either through allegations of infringement or of the domestic industry technical prong. *See* CIB at 76, 80. These claims are reproduced below:

1. An apparatus comprising:

a structure for receiving manual input;

a dynamic magnetic stripe communication device; and

a processor for controlling the dynamic magnetic stripe communication device,

wherein the dynamic magnetic stripe communication device is operable to electrically couple to a payment terminal when the dynamic magnetic stripe communication device is located outside and within proximity of the payment terminal and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal.

....

4. The apparatus of claim 1, wherein the apparatus is a portable telephonic device.

....

6. The apparatus of claim 1, further comprising a display operable to display a virtual payment card.

....

22. The apparatus of claim 1, wherein temporal pauses occur between the serial communications of the first magnetic stripe track data and the second magnetic stripe track data.

631 patent at cls. 1, 4, 6, 22.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 631 patent were construed, either as agreed between the parties or determined by Order No. 7:

Claim Term	Construction
“dynamic magnetic stripe communication device”	“a device capable of communicating dynamic magnetic stripe data”
“serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal”	“serially communicate first magnetic stripe track data and serially communicate second magnetic stripe track data while electrically coupled to the payment terminal”
“operable to electrically couple to a payment terminal . . . and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal”	“operable to electrically couple to a payment terminal . . . and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal,” This term was accorded its plain and ordinary meaning, but it was also construed to require electrical coupling and communication of magnetic stripe track data, wherein electrical communication of the latter necessarily but not exclusively accomplishes the former.
“within proximity of”	“within proximity of”
“virtual payment card”	“a visual representation of a payment card”

See Order No. 7 at 25, 27, 31, 33, 34.

1. “electrically couple”

In its briefing, Dynamics does not identify additional terms for construction, except to note that “electrically couple” as it is found in the 631 patent should receive the same meaning as in the 100 patent. *See* CIB at 75; CRB at 47. Samsung agrees. RRB at 50. Given the shared specification, “electrically couple” in the 631 patent is construed in the same way as in the 100 patent discussed above.

2. “an apparatus”

Samsung argues that the preamble of claim 1, “an apparatus,” is not limiting. RIB at 104. Dynamics makes no argument on this issue in its discussion of claim construction, but argues that “apparatus” is limiting in its discussion of invalidity. *See* CIB at 74-76, 84; CRB at 47. For support, Dynamics views “apparatus” as providing antecedent basis for usage in dependent claims. *Id.* (citing 631 patent at cl. 4; *Pacing Techs., LLC v. Garmin Intern., Inc.*, 778 F.3d 1021, 1024 (Fed. Cir. 2015); *Eaton Corp. v. Rockwell Intern. Corp.*, 323 F.3d at 1332, 1339 (Fed. Cir. 2003)).

As with “device” in the 100 patent, “an apparatus” in claim 1 offers no meaningful structural guidance, other than the claimed invention is a tangible item rather than a method or a composition of matter. Its use within all other claims in the patent (there are no other independent claims) is merely redundant introductory language, rather than a necessary antecedent basis. 631 patent at cls. 2 (“The apparatus of claim 1, wherein the apparatus is thicker than a payment card.”), 4 (“The apparatus of claim 1, wherein the apparatus is a portable telephonic device.”); *see id.* at cls. 3, 5. In contrast, the preamble at issue in *Pacing Techs.*, cited by Dynamics, was much more specific to the invention (“[a] repetitive motion pacing system for pacing a user”) and was otherwise “necessary to understand positive limitations in the body of the claims.” 778 F.3d at 1024; *see Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1292 (Fed. Cir. 2015) (discussing *Pacing Techs* and holding the preamble “[a] computer implemented method for pre-processing

digital content in a client device for subsequent electronic distribution” was “duplicative of the limitations in the body of the claim and merely provides context for the limitations.”). “Apparatus” is by no means “necessary to give life, meaning, and vitality” to any claim of the 631 patent, and is therefore not limiting. *Eaton Corp.*, 323 F.3d at 1339 (citation omitted).

3. “operable to”

As noted above, the parties dispute whether software required for MST functionality must be present on a device to infringe the asserted claims under the “operable to” claim language. While the parties do not discuss any of the claims of the asserted patents individually, the claims of the 631 patent do require a hardware-software combination that must perform the described function. Like the 153 patent, claim 1 of the 631 patent is specific as to the type of data the device is “operable to . . . serially communicate”; namely, “first magnetic stripe track data and second magnetic stripe track data.” 631 patent at cl. 1. This requisite, standardized format for the data is controlled by software. Claim 6, like claim 6 of the 100 patent, further recites “a display operable to display a virtual payment card.” This too requires particular programming which does more than mere activation of the “display.”

Accordingly, “operable to” in the 631 patent claim limitations discussed above is construed to require a hardware-software combination that must perform the described functions.

D. Infringement

According to Dynamics’ post-hearing briefing, the use, manufacture, or sale of all Accused Products are alleged to infringe claims 1, 4, 6, and 22 of the 631 patent. CIB at 76. Of these, claim 1 is independent and claims 4, 6, and 22 are dependent thereon. For the reasons discussed below, Dynamics has shown infringement of claims 1, 4, 6, and 22 by certain products.

As with the previous patents, the preliminary issue of whether Samsung’s Accused Products infringe at the time of importation needs to be resolved. As determined above, all asserted

[REDACTED]

claims of the 631 patent require the presence of enabling software. Because the Galaxy A50, Galaxy Note10, and Galaxy Note10+ do not include Samsung Pay at the time of importation, these devices do not infringe. The remaining Accused Products, otherwise including Samsung Pay but lacking a registered credit card number, are not barred from infringement on this ground, however.

Additionally, adjudication of the Hardware-Modified Products and the Software-Modified Products is warranted. As with the previous patents, there is no dispute the Hardware-Modified Products do not infringe the 631 patent. *See, e.g.*, RX-0051C at *5, 13; RIB at 36.

As to the Software-Modified Products, the above discussion of “operable to” as used in claim 1 of the 631 patent *does* require the device to actually perform the recited function of “serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal.” Thus, elimination of the precise code used to power the MST IC is a barrier to that communication and infringement of the claim. As all asserted claims depend from claim 1, the Software-Modified Products do not infringe the 631 patent.

1. Undisputed Claims

Samsung does not contest Dynamics’ claims of infringement under claims 4 and 6, apart from their dependency on claim 1 for which infringement is disputed. *See* RIB at 104-106; RRB at 50-51. In view of the testimony of Mr. Zatkovich that the Accused Products include the limitations recited in these claims, and there being no clear disagreement from Samsung as to that fact, the Accused Products meet the limitations of these dependent claims as alleged, with the exception of claim 6 (requiring software) and the Galaxy A50, Galaxy Note10, and Galaxy Note10+. *See* CX-1199C at Q/A 121-122; CIB at 79-80.

2. Disputed Claims

Samsung contests Dynamics’ claims of infringement under independent claim 1 and dependent claim 22. *See* RIB at 104-106.

[REDACTED]

a. Claim 1

For reference, claim 1 of the 631 patent requires:

1. An apparatus comprising:

a structure for receiving manual input;

a dynamic magnetic stripe communication device; and

a processor for controlling the dynamic magnetic stripe communication device,

wherein the dynamic magnetic stripe communication device is operable to electrically couple to a payment terminal when the dynamic magnetic stripe communication device is located outside and within proximity of the payment terminal and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal.

631 patent at cl. 1. There are two disputes between the parties as to whether the Accused Products meet the limitations of this claim—disputes over “electrically couple” and “serially communicate.” These are discussed below. For those remaining limitations which are not in dispute, the Accused Products have been shown to meet them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 115-119; CIB at 76-78.

As to whether the Accused Products “electrically couple,” the parties view this dispute as identical to that resolved above in connection with the 100 patent. RIB at 105; RRB at 50; *see* CRB at 47-48. Accordingly, the limitation is met in the Accused Products.

As to whether the Accused Products “serially communicate first magnetic stripe track data and second magnetic stripe track data,” Dynamics argues the [REDACTED] communicated by the products “include track 1 data (first magnetic stripe track data) and track 2 data (second magnetic stripe track data).” CIB at 79 (citing CX-1199C at Q/A 120; RX-167[4]C at Q/A 36-37, 46; RX-1627C at *1). Dynamics continues, [REDACTED]

[REDACTED]

[REDACTED] *Id.* (citing CX-1199C at Q/A 120; RX-

[REDACTED]

167[4]C at Q/A 36-37, 46; RX-1627C at *1); CRB at 48 (citing, *inter alia*, Hr’g Tr. at 497:3-498:22, 504:5-19, 505:5-12).

Samsung admits the Accused Products “transmit both track 1 and track 2,” but argues “there is no evidence in this Investigation of the Accused Products actually *communicating* both track 1 and track 2 to a payment terminal.” RIB at 105 (citing RX-1675C at Q/A 157-170). Rather, argues Samsung, “Mr. Zatkovich’s test results show ‘only the communication of Track 2.’” *Id.* (citing RX-1675C at Q/A 161-163; CX-1199C at Q/A 120). Samsung views both parties’ experts as agreeing that “‘communication requires that the receiver actually receive and understand what’s being transmitted.’” *Id.* (citing Hr’g Tr. at 259:13-17, 313:11-20; RX-1675C at Q/A 158-160, 231-232); RRB at 51. Put another way, Samsung characterizes the Accused Products [REDACTED] as “merely an ‘attempt to communicate’” in that the [REDACTED] are emitted “in the hope that one of those tracks will be received successfully by the reader.” *Id.* (citing CIB at 79; RX-1675C at Q/A 344; RX-1684C at Q/A 21-22; RX-0580C at *3; RX-0576C at *21; Hr’g Tr. at 588:2-15)).

Samsung’s defense implicates a pure question of claim construction: whether “operable to . . . serially communicate” two tracks of magnetic stripe data requires that “the receiver actually receive and understand what’s being transmitted.” RIB at 105 (citation omitted). Samsung, of course, argues that it does. *See id.* Dynamics does not address the question explicitly, and instead appears to argue that communication occurs even under Samsung’s proposed construction. *See* CRB at 48 (“the card reader should process each and every one of the [REDACTED] even if the first transmitted track is received successfully”). Dynamics’ argument is not supported by the evidence, however, because its own expert’s testing only showed one track of data processed by the reader. *See* CX-1199C at Q/A 120. Samsung’s expert explains that this is

[REDACTED]

normal: once the payment terminal successfully receives one track of data, it “will generally process the received data, complete the transaction, and ignore any other transmissions that follow.” RX-1675C at Q/A 168.

So Samsung’s arguments must be addressed, because although other terms of this claim element were previously construed, this particular term was not. *See* Order No. 7 at 28-31. The experts seemingly agree that “communicate” in this context means “transmitted [and] received and understood.” Hr’g Tr. at 313:11-20; *see* RX-1675C at Q/A 160. Even accepting this as true, however, it is not the end of the analysis. First, the claim covers an apparatus that is “operable to . . . serially communicate” track data, as opposed to a system or method for signal processing. To be sure, based on the construction of “operable to” outlined above for other claims and other patents, an apparatus is “operable to” serially communicate two tracks of magnetic stripe data while electrically coupled to the payment terminal when such communication actually occurs. But there is a limit to the scope of “operable to,” because whether the apparatus is operable to communicate should not depend on whether the payment terminal is operable to communicate. As long as the apparatus is “capable of” communicating the track data, and actually does transmit it, it is “operable,” even when the payment terminal does not process the data. *E.g., In re Imes*, 778 F.3d 1250, 1253-544 (Fed. Cir. 2015) (“We see no error in the Board’s construction of [‘operable to wirelessly communicate streaming video to a destination’] as ‘capable of wirelessly communicating continuous video transmission.’”).

Second, the specification describes different payment terminal embodiments, including one with “the ability to read two tracks of information (*e.g.*, may include at least two read heads)” and one where “all of the information . . . may be included on one magnetic track.” 631 patent at 6:32-38. A device “operable to” communicate two tracks of magnetic stripe data would apparently

[REDACTED]

operate successfully with either payment terminal, even though in the latter case transmission of the second track would be superfluous. So, again, the operability of the payment terminal is irrelevant. As another example, if the payment terminal has, say, lost power, any attempt to execute a payment transaction would necessarily fail, even though the claimed apparatus performs properly. In such a case, under Samsung’s proposed construction, the apparatus would not infringe. This is not reasonable; again, the manner in which the payment terminal operates, or fails to operate, should not have any effect on whether the claimed apparatus falls within the scope of the claims, so long as the apparatus is capable of performing its part of the operation—namely, data transmission—and actually does so.

So Samsung’s proposed construction is rejected. Instead, the term “operable to . . . serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal” is construed as “capable of serially communicating first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal, and actually transmitting such data.” Samsung’s expert agrees that the Accused Products transmit two tracks, even when the data from only one track is processed, “to ensure maximum compatibility with the many different readers that may be encountered in payment terminals.” CX-1675C at Q/A 170. Under this construction, therefore, the Accused Products are capable of serial communication of two tracks of data, and actually transmit such data. And given that the “electrically couple” element is met, they are capable of such serial communication “while electrically coupled to the payment terminal.”

Accordingly, the Accused Products (not including the Galaxy A50, Galaxy Note10, and Galaxy Note10+) infringe claim 1 of the 631 patent.

b. Claim 22

For reference, claim 22 of the 631 patent requires:

[REDACTED]

22. The apparatus of claim 1, wherein temporal pauses occur between the serial communications of the first magnetic stripe track data and the second magnetic stripe track data.

631 patent at cl. 22. For this claim, Dynamics argues there is a [REDACTED] [REDACTED] from the Accused Products, and this constitutes the required “temporal pause.” CIB at 80 (citing CX-1199C at Q/A 123). Samsung does not dispute the existence of the [REDACTED], but instead simply relies on lack of infringement of claim 1, which, as noted, is not a meritorious argument. *See* RIB at 105-106; RRB at 51.

Accordingly, the Accused Products (not including the Galaxy A50, Galaxy Note10, and Galaxy Note10+) infringe claim 22 of the 631 patent.

E. Domestic Industry – Technical Prong

According to Dynamics’ post-hearing briefing, all DI Products practice claims 1 and 22 of the 631 patent, and the NBD Emirates device additionally practices claim 6. *See* CIB at 80. For the reasons discussed below, Dynamics has not shown that the DI Products practice the claims.

Again, no actual article of the Emirates NBD device has been shown to exist at the time of the filing of Dynamics’ complaint. *Thermoplastic Motors*, Inv. No. 337-TA-1073, Comm’n Op. at 10. And, again, Dynamics makes no argument that “significant and unusual developments” have occurred to consider post-complaint evidence, nor has Dynamics argued domestic industry for the 631 patent is “in the process of being established.” *See generally* CIB; CRB. Accordingly, and apart from the discussion below, the Emirates NBD device cannot support domestic industry under the 631 patent.

1. Claim 1

Claim 1 of the 631 patent is presented above in connection with infringement. The primary dispute between the parties is whether the DI Products are operable while outside a magnetic stripe reader and to serially communicate tracks of data as claimed. This is discussed below. For those

[REDACTED]

remaining limitations which are not in dispute, the DI Products have been shown to practice them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 109-110; CIB at 80-81.

As to “operable to electrically couple to a payment terminal when the dynamic magnetic stripe communication device is located outside and within proximity of the payment terminal,” Dynamics refers to the testimony of Mr. Zatkovich (CIB at 82 (citing, *inter alia*, CX-1199C at Q/A 94)) and of Dr. Apsel (*id.* (citing, *inter alia*, Hr’g Tr. at 582:16-583:5); *see* CRB at 49), as discussed in connection with the 100 patent. Samsung similarly refers to the “outside-the-reader limitation” of the 100 patent and incorporates its prior discussion. *See* RRB at 51-52; RIB at 107. Accordingly, and as determined above, only the CIBC DI Product has been shown to practice this limitation.

As to “operable . . . to serially communicate first magnetic stripe track data and second magnetic stripe track data,” Dynamics argues that the DI products each include source code for transmitting track 1 data and track 2 data serially, [REDACTED] and bit by bit. CIB at 83 (citing CX-1199C at Q/A 112; RX-0561C at *26-33, 45-66, 70-83). In its reply brief, Dynamics reasons that a lack of testing data showing communication of both track 1 and track 2 in a single session may be explained by card readers’ processing of first-received data and ignoring the rest. CRB at 50 (citing RX-1675C at Q/A 168). Moreover, Dynamics argues “communication” “would occur when voltages are induced in the read-head that correspond to the F2F input currents provided to each of the coils (each of the DI products has separate coils for track 1 and track 2).” *Id.*

For this limitation, Samsung argues many of the same points as with infringement; emphasizing “communication” as used in the claim requires more than just transmission, and a

[REDACTED]

lack of evidence that the DI Products have ever successfully communicated both track 1 and track 2 data to a reader. *See* RIB at 107-108; RRB at 52. Regarding Dr. Apsel, Samsung notes “[t]o the extent she was able to get the CIBC card to communicate from outside the reader, it only communicated track 1, and not track 2.” RIB at 108 (citing RX-1675C at Q/A 230, 199-203; Hr’g Tr. at 608:23-609:20); RRB at 52. Unlike the Accused Products, Samsung argues the DI Products’ transmission of track 1 and 2 simultaneously (designed for inside-the-reader swiping) likely creates interference preventing successful communication of both tracks. RIB at 108 (citing, *inter alia*, CX-1198C at Q/A 53-54; Hr’g Tr. at 317:6-15, 609:21-611:18, 606:1-607:1, 608:23-609:12; RX-1675C at Q/A 205-206, 233-234); RRB at 52.

The weight of the evidence does not support practice of the limitation. Dynamics does not dispute that there is no testing record of both tracks being received by a card reader. The interference problem posited by Dr. Apsel (RX-1675C at Q/A 205-206; Hr’g Tr. 609:21-611:18) and recognized by Dynamics’ witnesses Mr. Workley (CX-1198C at Q/A 53-57; RX-0042C at 24:16-24) and Mr. Zatkovich (Hr’g Tr. at 317:1-15) is eminently plausible, and highlights the need for actual test results for this particular limitation and these particular products (*see, e.g.*, CX-1198C at Q/A 31-39, 44-47 (describing efforts to specifically adapt to inside-the-reader communication)). Dynamics’ additional theory, that voltages corresponding to the F2F input currents “would occur” in “the read-head” thereby creating “communication,” is not supported by any evidence. *See* CRB at 50 (no citation). And even if some voltage is induced in a read head, it stands to reason that the posited interference would result in noise, rather than a signal adequate to communicate the claimed track data. So applying the same construction as with infringement, Dynamics has not shown it more likely than not that the DI Products are “capable of” serially

[REDACTED]

communicating two tracks of magnetic stripe data while electrically coupled to a payment terminal, even if they actually transmit them.

Accordingly, the limitation is not met and claim 1 is not practiced by the DI Products.

The Emirates NBD device has not been shown to practice claim 1 for an additional reason. As determined above, “operable to” in claim 1 requires the recited functions to take place in a hardware-software combination. The evidence shows the only embodiment of the Emirates NBD device made available to Samsung as part of this investigation—the card demonstrated on October 17, 2019—[REDACTED] to accomplish magnetic stripe data communication. *See, e.g.*, RRB at 59 (citations omitted); CRB at 53-60; CIB at 33-34 (implicitly admitting [REDACTED] was not present); CX-1199C at Q/A 127, 129. Thus, there can be no practice of the claim by this device, in particular.

2. Claim 6

For reference, claim 6 of the 631 patent requires:

6. The apparatus of claim 1, further comprising a display operable to display a virtual payment card.

631 patent at cl. 6. As to whether the Emirates NBD card is “operable to display a virtual payment card,” Samsung identifies this dispute as identical to claim 6 of the 100 patent. RIB at 109; RRB at 52. Dynamics similarly refers to evidence cited in connection with claim 6 of the 100 patent (*see* CIB at 83), but adds the display can output graphical messages and “virtual representations of payment cards (*e.g.*, a payment card number, a Visa/MasterCard logo, an expiration date, etc.)” (*id.* (citing CX-1199C at Q/A 113; CX-0656; CX-1116)). As determined above in connection with the 100 patent, the claim language “operable to” requires the act to take place. The record does not show that a visual representation of a card is ever displayed. *See* CX-1199C at Q/A 126.

Accordingly, claim 6 of the 631 patent is not practiced by the Emirates NBD card.

[REDACTED]

3. Claim 22

Claim 22 of the 631 patent is presented above in connection with infringement. The primary dispute between the parties is whether the DI Products include temporal pauses between tracks of data. Dynamics argues succinctly, “DI products repeatedly send track data when the inductive sensors of these devices are activated by any metallic object. . . . A temporal pause exists between each repetition.” CIB at 83 (citing CX-1199C at Q/A 68)).

In opposition, Samsung argues track 1 and track 2 are sent simultaneously, and thus there can be no pauses. RIB at 109 (citing, *inter alia*, RX-1675C at Q/A 236-238; Hr’g Tr. at 51:19-52:3, 314:19-315:19). Samsung also notes that Mr. Zatkovich, Dynamics’ expert, did not opine that claim 22 was practiced by the DI Products in his witness statements—only to state “Track 1 is transmitted sequentially prior to Track 2” before admitting “[REDACTED]” *Id.* at 110 (citing Hr’g Tr. at 316:10-22).

The claim is not met. Dynamics’ witnesses, Mr. Workley and Mr. Zatkovich, both concede track 1 data and track 2 data transmissions [REDACTED] Thus, there can be no pause between them. Dynamics offers no rebuttal to Samsung’s argument here. *See* CRB at 50-51; RRB at 52-53.

Accordingly, claim 22 is not practiced by the DI Products.

F. Validity

Samsung identifies the following invalidity theories for the 631 patent:

Claims	Theory
1, 4	Anticipated under 35 U.S.C. § 102(a) and (b) by VivoTech (RX-0881)
1, 4	Anticipated under 35 U.S.C. § 102(a) and (b) by Doughty (RX-0283)

1, 4, 6, 22	Rendered obvious under 35 U.S.C. § 103 by VivoTech (RX-0881) and Kim (RX-0871), Pitroda (RX-0878), Zellner (RX-0880), and/or Francini (RX-0873)
1, 4, 6, 22	Rendered obvious under 35 U.S.C. § 103 by Doughty (RX-0283) and VivoTech (RX-0881) or Francini (RX-0873)
22	Lack of written description under 35 U.S.C. § 112, ¶ 1
1, 4, 6, 22	Invalid under 35 U.S.C. §§ 102(f), 116 due to incorrect inventorship

See generally RIB at 110-118; RRB at 53-57. VivoTech, Doughty, Kim, Pitroda, and Zellner are prior art to the 631 patent under 35 U.S.C. § 102, for the same reasons they are prior art to the 100 patent, and Dynamics does not dispute this conclusion. *See generally* CIB; CRB. Further, U.S. Patent No. 4,701,601 (“Francini”) “issued on October 20, 1987 from an application filed on April 26, 1985, and is therefore prior art under 35 U.S.C. sections 102(a), (b), and (e).” RX-1677C at Q/A 220; *see* RX-0873.

1. VivoTech

Samsung contends claims 1 and 4 are anticipated by VivoTech. RIB at 110-112.

As for claim 1 and “a structure for receiving manual input,” VivoTech discloses a keyboard or other input device on the adapter for inputting personal information. *See* RIB at 110-111 (citing, *inter alia*, CPB at 126-127; RX-0881 at 5:3-20; RX-1677C at Q/A 202). As for “a dynamic magnetic stripe communication device,” VivoTech teaches this element for the same reasons as a similar claim limitation in claim 1 of the 100 patent (*id.* (citing RX-1677C at Q/A 204-206); *see* 100 patent at cl. 1 (“a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader”)). As for “a processor for controlling the dynamic magnetic stripe communication device,” VivoTech teaches this

[REDACTED]

element, too, for the same reasons as a similar claim limitation in claim 1 of the 100 patent (*id.* (citing RX-1677C at Q/A 207-208); *see* 100 patent at cl. 1 (“a processor for controlling the circuit”)).

As for “wherein the dynamic magnetic stripe communication device is operable to electrically couple to a payment terminal when the dynamic magnetic stripe communication device is located outside and within proximity of the payment terminal and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal,” Samsung argues that “VivoTech’s adapter communicates both ISO-standard track 1 and track 2, one after another,” which is not in dispute. *Id.* at 111-12 (citing RX-0881 at 6:49-7:2, 5:64-67; Hr’g Tr. at 802:25-804:10, 860:8-17).

Samsung has shown anticipation of claim 1 by VivoTech by clear and convincing evidence as alleged above. The claim is essentially the same as claim 1 of the 100 patent, requiring the communication of magnetic stripe track data through electrical coupling from outside a payment terminal, but omits the quarter of an inch specified range and adds a requirement for serial transmission of first and second tracks of data. Dynamics’ opposition is likewise a revisit of its earlier argument. Dynamics argues the preamble, “an apparatus” is limiting and not met by VivoTech’s adapter, which is not separate from the payment terminal when placed in proximity. CIB at 84 (citing CX-1204C at Q/A 107). Dynamics argues this lack of separation prevents finding communication of data from outside the terminal (assumedly making it inside the terminal somehow). *See id.* As determined above, however, “an apparatus” is not limiting, rendering the opposition ineffective. As to Samsung’s assertion that VivoTech also discloses serial communication of first and second tracks of data, that is accurate. VivoTech teaches its outer coil

[REDACTED]

76 transmits first, followed by the inner coil 74, where each is responsible for Track 1 and then Track 2 data respectively. RX-0881 at 6:49-7:9.

Accordingly, Samsung has shown that VivoTech anticipates claim 1 of the 631 patent.

As for claim 4 and “wherein the apparatus is a portable telephonic device,” the parties treat this identically to claim 4 of the 100 patent. RIB at 112; CIB at 84-85. As determined above, VivoTech does not disclose its device could be a portable telephonic device.

Accordingly, Samsung has not shown that VivoTech anticipates claim 4 of the 631 patent.

2. Doughty

Samsung contends claims 1 and 4 are anticipated by Doughty. RIB at 112-114. As for claim 1 and “a structure for receiving manual input,” Doughty teaches “that its apparatus may include a number of manual input structures, such as a touch pad, one or more buttons, and a fingerprint sensor.” See RIB at 112 (citing, *inter alia*, CPB at 126-127; RX-0283 at [0042]; RX-1677C at Q/A 267-268). As for “a dynamic magnetic stripe communication device,” Doughty teaches this element for the same reasons as a similar claim limitation in claim 1 of the 100 patent (*id.* at 112-14 (citing RX-1677C at Q/A 269-270); see 100 patent at cl. 1 (“a circuit operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader”)). As for “a processor for controlling the dynamic magnetic stripe communication device,” Doughty teaches this element, too, and for the same reasons as a similar claim limitation in claim 1 of the 100 patent (*id.* (citing RX-1677C at Q/A 271); see 100 patent at cl. 1 (“a processor for controlling the circuit”)).

As for “wherein the dynamic magnetic stripe communication device is operable to electrically couple to a payment terminal when the dynamic magnetic stripe communication device is located outside and within proximity of the payment terminal and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the

payment terminal,” Samsung argues that “Doughty describes that ‘magnetic stripe 502 will typically contain three tracks,’” and because Doughty uses a singly inductive coil, the data would need to be communicated one after another. *Id.* at 113-114 (citing RX-0283 at [0053]; RX-1677C at Q/A 275-276; Hr’g Tr. at 840:23-841:24, 860:18-861:5).

Samsung has met its burden on all but the last limitation. Claim 1 of the 631 patent is largely the same as claim 1 of the 100 patent, requiring the communication of magnetic stripe track data through electrical coupling from outside a payment terminal. However, as determined above, Doughty does not clearly disclose outside-the-reader communication.

Accordingly, Samsung has not shown that Doughty anticipates claim 1 of the 631 patent, nor, due to its dependency, claim 4.

3. VivoTech in combination

In addition to anticipation, discussed above, Samsung contends claims 1, 4, 6, and 22 are obvious in light of VivoTech and various other references. *See* RIB at 114-115. Claim 1 is obvious because it is anticipated (*In re Kalm*, 378 F.2d at 962), and claims 4, 6, and 22 are discussed below.

As to claim 4 requiring “wherein the device is a portable telephonic device,” Samsung refers to its obviousness discussion of claim 4 of the 100 patent. RIB at 114; RRB at 54. As determined there, Samsung has not met its clear and convincing burden.

Accordingly, Samsung has not shown the obviousness of claim 4 of the 631 patent.

As to claim 6 and “comprising a display operable to display a virtual payment card,” Samsung refers to its obviousness discussion of claim 6 of the 100 patent. RIB at 114; RRB at 54. As determined there, Samsung has not met its clear and convincing burden.

Accordingly, Samsung has not shown the obviousness of claim 6 of the 631 patent.

As to claim 22 and “wherein temporal pauses occur between the serial communications of the first magnetic stripe track data and the second magnetic stripe track data,” Samsung refers to

[REDACTED]

VivoTech’s explicit disclosure of communication of track 1 data followed by track 2 data. RIB at 115 (citing RX-0881 at 6:49-66). Samsung argues there are only two possible ways to accomplish this—with a temporal pause or without—and so “it would have been obvious to a POSITA to try both.” *Id.* (citing RX-1677C at Q/A 216-218; KSR, 550 U.S. at 421). Samsung also argues it would have been obvious in light of prior art reference Francini, which inherently discloses “a temporal pause of 900 to 970 milliseconds between each transmission” from a magnetic stripe emulator. *Id.* (citing RX-0873 at 7:45-54; RX-1677C at Q/A 221-222). Samsung explains that such pauses between transmissions “make it easier to distinguish tracks from one another, thereby reducing errors, and they also give the magnetic stripe reader time to reset if one of the earlier transmissions caused an error.” *Id.* (citing RX-1677C at Q/A 225); RRB at 54-55 (citing RX-1677C at Q/A 228 (“This is even more important when the transmitting device is outside of a reader, and therefore potentially out of range or out of position.”)). Samsung asserts obviousness here is effectively undisputed by Dynamics. *See* RIB at 115 (citing CX-1204C at Q/A 110); RRB at 54-55.

Samsung has clearly and convincingly shown the obviousness of including a temporal pause in between the track transmissions of VivoTech. The scope and content of the prior art come close to anticipation (because claim 1 is anticipated and claim 22 adds only the temporal pause limitation), and the principle that a limited set of options increases the obviousness of a claimed feature directly applies here. *KSR*, 550 U.S. at 421 (“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.”). Claim 22 places no restriction on the duration of the temporal pause, nor, as discussed below, does the specification of the 631 patent. Thus, a POSITA looking to practice VivoTech’s

serial track 1 and track 2 data transmissions would truly have faced the limited decision of including a pause or not, so a temporal pause would have been well within the capability and knowledge of a skilled artisan. And not only would a pause have been obvious to try, but, given claim 22's flexibility on the duration, even the smallest of pauses would qualify, and likely would have naturally happened just from processing lag unless the POSITA designed otherwise.

Dynamics' opposition is not persuasive. Dynamics argues the obviousness theory "is incorrect, because VivoTech does not teach temporal pauses." CIB at 86 (citation omitted). This is irrelevant to whether it would have been obvious to include such pauses. Dynamics adds "Mr. Lipoff does not contend, nor could he, that Francini discloses operating outside a reader" (*id.* (citation omitted)) and "[n]either VivoTech nor Francini teaches communicating with a read-head from outside the reader" (*id.* (citation omitted)). The second point is plainly incorrect (*see* RX-0881 at Figs. 3A-4B), and neither point is relevant to the question of temporal pauses; it also bears noting that two references need not disclose identical magnetic emulation techniques to be considered analogous art. *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1379 (Fed. Cir. 2019) (holding first of two possible tests for analogous art is simply "'whether the art is from the same field of endeavor, regardless of the problem addressed'" (citation omitted)). As for secondary considerations of non-obviousness, those presented by Dynamics are not tailored to claim 22 and thus not probative. *See* CIB at 87; *id.* at 65-68; CRB at 45; *In re Huai-Hung Kao*, 639 F.3d at 1068; *Merck*, 808 F.3d at 837.

Accordingly, Samsung has shown that claim 22 of the 631 patent is invalid as obvious over VivoTech and the knowledge of one of ordinary skill in the art.

4. Doughty in combination

In addition to anticipation, discussed above, Samsung contends claims 1, 4, 6, and 22 are obvious in light of Doughty and various other references. *See* RIB at 115-117.

[REDACTED]

With respect to claim 1, Doughty has been found to disclose all limitations except outside-the-reader communication. Samsung refers to its discussion of the similar limitation in the 100 patent as “it would have been obvious in view of VivoTech, for the same reasons.” RIB at 116 (citing RX-1677C at Q/A 274); RRB at 55. In opposition, Dynamics argues the practical considerations and barriers that go along with the proposed modification, such as alignment and interference, have not been answered by Samsung. *See* CIB at 87 (citing CX-1204C at Q/A 85-87; RX-1677C at Q/A 246-[274]); CRB at 51.

Samsung has met its burden here, for the same reasons discussed above in connection with the 100 patent. Simply put, a portable communications device with a swipeable portion or adapter containing a magnetic emulator (Doughty) would obviously benefit from the elimination of the need for that portion or adapter—a benefit conferred by an outside-the-reader emulator (VivoTech). Dynamics’ concerns over implementation details are themselves not explained (CX-1204C at Q/A 85-87; *see* Hr’g Tr. at 801:8-10) and have not otherwise been alleged to be beyond the skill of a POSITA (CIB at 87; CIB at 51).

Accordingly, Samsung has shown that claim 1 of the 631 patent is invalid as obvious over Doughty and VivoTech.

As for claim 4 and “wherein the apparatus is a portable telephonic device,” Samsung refers to its discussion of the similar limitation in the 100 patent. RRB at 55. Dynamics refers similarly. CIB at 86-87; CRB at 51. As determined, Samsung has shown Doughty, on its own, discloses placing a magnetic emulator in a personal telecommunications device. RX-0283 at [0048].

Accordingly, Samsung has shown claim 4 of the 100 patent to be obvious over Doughty and VivoTech.

[REDACTED]

As for claim 6 requiring “comprising a display operable to display a virtual payment card,” Samsung refers to its obviousness discussion of claim 6 of the 100 patent. RIB at 116; RRB at 55. Dynamics refers similarly. CIB at 87; CRB at 51. As determined there, Samsung has shown it would have been an obvious modification to the device of Doughty and VivoTech, in light of Zellner.

Accordingly, Samsung has shown that claim 6 of the 631 patent is invalid as obvious over Doughty, VivoTech, and Zellner.

As for claim 22, requiring “wherein temporal pauses occur between the serial communications of the first magnetic stripe track data and the second magnetic stripe track data,” Samsung argues it would have been obvious in light of Doughty’s own disclosures. RIB at 116-117. Samsung argues “Doughty’s time-varying embodiment uses a single inductive coil to communicate track 1 and track 2 one after another,” and, similar to the VivoTech discussion above, there are only two options, “immediately one after another, or with temporal pauses between.” *Id.* at 116 (citing RX-1677C at Q/A 280-287); RRB at 56. Samsung similarly refers to Francini, which discloses temporal pauses of 900 to 970 milliseconds in between tracks which “make it easier to distinguish tracks from one another.” RIB at 116-117 (citing RX-0873 at 7:45-54; RX-1677C at Q/A 283). For all the same reasons discussed above in the context of claim 22 and VivoTech, Samsung’s position is persuasive on this claim.

Dynamics’ opposition is, on the other hand, minimal and without merit. It asserts, incorrectly, that the combination is only Doughty and Francini, and since neither teaches outside-the-reader communication, not all limitations of claim 22 (depending on claim 1) are taught by the proposed combination. *See* CIB at 87; CRB at 51.

[REDACTED]

Accordingly, Samsung has shown that claim 22 of the 631 patent is invalid as obvious over Doughty, VivoTech, and Francini.

5. 35 U.S.C. § 112, ¶ 1 (Written Description)

For the 631 patent, Samsung also argues a lack of written description under 35 U.S.C. § 112 invalidates claim 22 for a failure to disclose “temporal pauses” between serial communications of track data. RIB at 117-118 (citing, *inter alia*, RX-1677C at Q/A 365-368; Purdue Pharma L.P. v. Faulding Inc., 230 F.3d 1320, 1329 (Fed. Cir. 2000)). Samsung adds that Dynamics never briefed this issue in its pre-hearing brief, so any argument now is waived under Ground Rule 9.2. *Id.* at 117-118 (citing CPB at 131); RRB at 56-57.

Samsung is correct that Dynamics provided no discussion of this invalidity theory in its pre-hearing brief and has waived any opposition. CPB at 131. Samsung is also correct that the 631 patent specification contains no explicit mention of temporal pauses, or breaks, between the serial communication of track data. *See generally* 631 patent. Nonetheless, as explained above, temporal pauses between track data transmissions would be obvious to implement; indeed, the lack of a lower bound on the duration of such temporal pauses suggests that even naturally-occurring gaps in data transmission might qualify. So the amount of disclosure needed to “convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date” is correspondingly small. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (citing 35 U.S.C. § 112).

Two passages of the specification are especially relevant: “[t]he current may then be removed from the magnetic emulator [so that] the electromagnetic field is removed,” and “a string of a particular bit of data . . . may be communicated before as well as after information is communicated through a magnetic emulator.” 631 patent at 13:13-15, 13:48-51. Admittedly, these passages refer to F2F encoding and self-clocking, rather than to temporal pauses, but both

[REDACTED]

passages combined with the background knowledge of a skilled artisan would seemingly be adequate to meet the minimal showing required under the circumstances.

Accordingly, Samsung has not shown claim 22 of the 631 patent is invalid for lack of written description.

6. 35 U.S.C. §§ 102(f), 116 (Improper Inventorship)

Samsung lastly argues “[t]he ’631 patent is invalid and unenforceable under 35 U.S.C. §§ 102(f) and 116 for the same reasons as the ’100 patent.” RIB at 118 (citing RX-0006C at 148:11-17, 162:17-164:7); RRB at 57. Dynamics opposes, stating “[f]or the reasons discussed above, Samsung has not met its burden to show that the named inventors on the Mullen Patents are incorrect. Therefore, the ’631 patent is not invalid on grounds of incorrect inventorship.” CIB at 88; CRB at 51.

As determined above, Samsung provides insufficient corroboration for the testimony of Mr. Cloutier to invalidate the claims of the 100 patent. For the 631 patent, with its own distinct set of claims, Samsung’s discussion is negligible (*see* RIB at 118; RRB at 57) and Mr. Cloutier’s testimony on lack of inventorship is even less convincing. For example, Mr. Cloutier testified detecting the presence of a read-head “was not an idea present before my employment. That would be an item that I did invent.” RX-0006C at 139:15-23. This feature matches dependent claims 8 and 9 of the 631 patent. *See* 631 patent at cls. 8 (“wherein the processor is operable to determine the presence of a read-head of a magnetic stripe reader”), 9 (“determine presence of a read-head of a magnetic stripe reader”). The subsequent questioning from Samsung’s counsel does not overturn this perceived contribution. *See* RX-0006C at 140:3-143:9. Given that a co-inventor need only contribute to the conception of a portion of any claim (*Gemstar*, 383 F.3d at 1381-82), this alone is sufficient to preclude invalidation of the entire 631 patent.

[REDACTED]

Accordingly, Samsung has not shown, by clear and convincing evidence, invalidity of any claim of the 631 patent for improper inventorship.

VII. U.S. PATENT NO. 10,255,545

A. Level of Ordinary Skill in the Art

As person having ordinary skill in the art of the 545 patent at the time of invention “would have: an undergraduate degree in computer science, electrical engineering, or the equivalent (including computer engineering) and at least three years of experience with point of sale systems and the use of magnetic fields to convey information.” Order No. 7 at 7.

B. Claims-at-Issue

Claims 1, 3, and 5 of the 545 patent are at issue in this investigation, either through allegations of infringement or of the domestic industry technical prong. *See* CIB at 91, 94. These claims are reproduced below:

1. A device comprising:

circuitry operable to communicate with a cellular network;

RFID circuitry operable to electrically couple the device to a payment terminal and to communicate RFID data to the payment terminal;

a coil; and

a processor for controlling the operation of the coil such that the coil is operable to electrically couple the device to the payment terminal and to communicate data in magnetic stripe data format to the payment terminal,

wherein the coil is operable to electrically couple the device to the payment terminal from a position beneath a surface of the device.

....

3. The device of claim 1, wherein the device is a portable telephonic device.

....

5. The device of claim 1, further comprising a display operable to display a virtual payment card.

545 patent at cls. 1, 3, 5.

C. Claim Construction

As part of the *Markman* process, the following claim terms of the 545 patent were construed, either as-agreed between the parties or determined by Order No. 7:

Claim Term	Construction
“operable to electrically couple [the device] to a payment terminal and to communicate [data in magnetic stripe data format/magnetic stripe data] to the payment terminal”	“operable to electrically couple [the device] to a payment terminal and to communicate [data in magnetic stripe data format/magnetic stripe data] to the payment terminal”
“within proximity of”	“within proximity of”

See Order No. 7 at 35, 36.

1. “a device”

As with the 153 and 100 patents, Dynamics argues the preamble to claim 1, “a device,” should be construed as limiting and given its plain and ordinary meaning, and refers to its discussions of the 153, 100, and 631 patents for support. CIB at 90; *see* CRB at 52; *see also* CIB at 98-99. Samsung also refers to its own 100 patent discussion to argue it is not limiting. RIB at 119; RRB at 58.

As with the other patents, the preamble of claim 1 of the 545 patent, “a device,” is not limiting. For the 545 patent specifically, Dynamics argues “[t]he preamble is necessary to provide structure to the remaining limitations of claim 1 because the circuitry for communicating with a cellular network, coil, RFID circuitry, and processor must function as part of a device, rather than a system of separate and distinct devices.” CRB at 52. As determined above and revealed in Dynamics’ briefing, there is no known structure for “a device,” however. Nor does the term give meaning to the “a position beneath a surface of the device” limitation, because, as Samsung notes,

[REDACTED]

all devices have at least one surface. *See* RIB at 119.

2. “electrically couple”

Dynamics argues that “electrically couple” as it is found in the 545 patent should receive the same meaning as in the 100 and 631 patents. *See* CIB at 91; CRB at 52-53. Samsung agrees. RRB at 58. Given the shared specification, “electrically couple” in the 545 patent is construed in the same way as in the 100 and 631 patents above.

3. “operable to”

As noted above, the parties dispute whether software required for MST functionality must be present on a device to infringe the asserted patents under the “operable to” claim language. While the parties do not discuss any of the claims of the asserted patents individually, the claims of the 545 patent do require a hardware-software combination that must perform the described function. Like the 153 patent, claim 1 of the 545 is specific, in two places, as to the type of data the device is “operable to . . . communicate”; namely, “RFID data” and “data in magnetic stripe data format.” 545 patent at cl. 1. These requisite, standardized formats for the data are controlled by software. Claim 5, like claim 6 of the 100 and 631 patents, recites “a display operable to display a virtual payment card.” This, too, requires particular programming beyond mere activation of the “display.”

Accordingly, “operable to” in the 545 patent claim limitations discussed above is construed to require a hardware-software combination that must perform the described functions.

D. Infringement

According to Dynamics’ post-hearing briefing, the use, manufacture, or sale of all Accused Products are alleged to infringe claims 1, 3, and 5 of the 545 patent. CIB at 91. Of these claims, claim 1 is independent and claims 3 and 5 are dependent thereon. For the reasons discussed below, Dynamics has shown infringement of claims 1, 3, and 5 of the 545 patent by certain products.

As with the previous patents, the preliminary issue of whether Samsung's Accused Products infringe at the time of importation needs to be resolved. As noted, all asserted claims of the 545 patent require the presence of enabling software. Because the Galaxy A50, Galaxy Note10, and Galaxy Note10+ do not include Samsung Pay at the time of importation, these devices do not infringe. The remaining Accused Products, otherwise including Samsung Pay but lacking a registered credit card number, are not barred from infringement on this ground, however.

Adjudication of the Hardware-Modified Products and the Software-Modified Products is also warranted. There is no dispute the Hardware-Modified Products do not infringe the 545 patent. *See, e.g.*, RX-0051C at *6, 14; RIB at 36. Accordingly, the Hardware-Modified Products do not infringe the 545 patent.

As to the Software-Modified Products, the above discussion of "operable to" as used in claim 1 of the 545 patent requires the device to actually perform the recited function of "communicate data in magnetic striped data format." Thus, elimination of the precise code used to power the MST IC is a barrier to that communication and infringement of the claim. As all asserted claims depend from claim 1, the Software-Modified Products do not infringe the 545 patent.

1. Undisputed Claims

Samsung does not contest Dynamics' claims of infringement under claims 3 and 5, apart from their dependency on claim 1, for which infringement is disputed. *See* RIB at 119-120; RRB at 58-59. In view of the testimony of Mr. Zatkovich that the Accused Products include the limitations recited in these claims, and there being no clear disagreement from Samsung as to that fact, the Accused Products meet the limitations of the dependent claims as alleged, with the exception of claim 5 (requiring software) and the Galaxy A50, Galaxy Note10, and Galaxy Note10+. *See* CX-1199C at Q/A 139-140; CIB at 94.

2. Disputed Claim

For reference, claim 1 of the 545 patent requires:

1. A device comprising:

circuitry operable to communicate with a cellular network;

RFID circuitry operable to electrically couple the device to a payment terminal and to communicate RFID data to the payment terminal;

a coil; and

a processor for controlling the operation of the coil such that the coil is operable to electrically couple the device to the payment terminal and to communicate data in magnetic stripe data format to the payment terminal,

wherein the coil is operable to electrically couple the device to the payment terminal from a position beneath a surface of the device.

545 patent at cl. 1. There are two main disputes between the parties as to whether the Accused Products infringe this claim—disputes over the “electrically couple” and “RFID circuitry” limitations. These are discussed below. For those remaining limitations which are not in dispute, the Accused Products have been shown to meet them as alleged in view of the testimony of Mr. Zatkovich. *See* CX-1199C at Q/A 132-134, 136-138; CIB at 91-94.

As to whether the Accused Products “electrically couple,” the parties identify this dispute as identical to that resolved above in connection with the 100 patent. RIB at 119; RRB at 58; *see* CRB at 53. Accordingly, the limitation is met in the Accused Products.

As to whether the Accused Products include “RFID circuitry,” Dynamics argues they do and are referred to by Samsung as NFC antennae. CIB at 92 (citing CX-1199C at Q/A 135; CX-0164 at *13, 15, 17; CX-0165 at *10). Dynamics contends that NFC “is a subset of RFID given that NFC utilizes a RFID specific frequency” and complies with the ISO 14443 standard, which mandates use of radio frequencies. CRB at 53 (citing, *inter alia*, CX-1199C at Q/A 55-56; RX-0679 at *3; RX-1653 at *3; RX-1667 at *8.). Dynamics adds that the coupling occurring through

[REDACTED]

NFC qualifies as “electrical coupling” (as used in the 100, 631, and 545 patents) in the same way as the magnetic stripe emulator. *Id.* at 54 (citing, *inter alia*, 100 patent at 5:62-6:3, 6:61-7:4)).

In its initial brief, Samsung argues, in heading, “The Accused Products Do Not Have RFID Circuitry,” and further argues NFC uses magnetic fields and inductive coupling, as opposed to electrical coupling. *See* RIB at 119-120 (citations omitted). In its reply brief, Samsung clarifies, in heading, “The Accused Products Do Not Have *The Claimed* RFID Circuitry,” and further argues that the RFID circuitry present in its products does not “electrically couple” as claimed. *See* RRB at 58-59 (emphasis added).

The limitation is met in the Accused Products. Dynamics’ expert, Mr. Zatkovich, opines that the Accused Products “support [NFC], which is a specific type of RFID interface,” and the “circuitry for NFC includes an RFID antenna that Samsung refers to as an NFC antenna.” CX-1199C at Q/A 135. Samsung’s expert, Dr. Apsel, opines that the “accused products use NFC, not RFID,” implying that NFC and RFID are fundamentally different, but the only difference she cites is that “NFC communicates using magnetic fields and uses inducted coupling, not electrical coupling.” RX-1675C at Q/A 176. As with “electrically couple” in the context of magnetic stripe track data, however, this is a distinction without a difference:

Emulator 351 may be able to generate electromagnetic fields of different frequencies and magnitudes, and operate in different manners, depending on drive signals provided by processor 360. Accordingly, emulator 351 may be driven to electrically couple with an RFID receiver and emulator 351 may also be driven to electrically couple with a magnetic stripe reader. Accordingly, processor 360 may drive emulator 351 to communicate information (e.g., payment information that includes dynamic information) to an RFID receiver when an RFID field is present and to a magnetic stripe reader when a magnetic stripe is present. Accordingly, for example, a multi-purpose emulator is provided. In instances where, for example, both an RFID field and a magnetic stripe reader is detected, processor 360 may select a default communications methodology (e.g., an RFID or magnetic stripe methodology). Processor 360 may be operable to communicate at least two different drive signals to emulator 351 (e.g., signals 391 and 392).

[REDACTED]

631 patent at 6:61-7:4; *see id.* at 7:53-58 (“Step 511 may be utilized to determine, of example, whether an RFID or a magnetic stripe reader is within the proximity of a card (or other device). Step 512 may be utilized to run an emulator as an RFID or magnetic stripe in response to step 511”). Because Samsung otherwise does not dispute the presence of “RFID circuitry operable to electrically couple the device to a payment terminal and to communicate RFID data to the payment terminal” in the Accused Products, this limitation is met.

Accordingly, the Accused Products (not including the Galaxy A50, Galaxy Note10, and Galaxy Note10+) infringe claim 1 of the 545 patent.

E. Domestic Industry – Technical Prong

According to Dynamics’ post-hearing briefing, only the Emirates NBD device practices the 545 patent; specifically, claims 1 and 5. *See* CIB at 94. Dynamics argues that, unlike the other three Asserted Patents, practice of the 545 patent by the Emirates NBD device is “in the process of being established.” CIB at 139-142 (discussing “necessary and tangible steps to establish a domestic industry . . . through designing and developing prototypes that incorporate the cellular technology protected by the ’545 patent and include Dynamics’ other proprietary technologies protected by the ’153, ’100, and ’631 patents” in the economic prong context); *see generally* CRB at 55-60 (referring to technical prong and product designs for “in the process of being established” cases, and summarily stating “[t]he Emirates NBD device meets the technical prong of the domestic industry”).²

² The only other Connected Wallet Card or Emirates NBD article evidenced as existing was presented at a tradeshow in early 2018 (CX-1116), but Dynamics effectively admits it did not practice the 545 patent (*see* CRB at 56 (device “download[ed] data over a pager network”); CX-1197C at Q/A 73-74; CX-1198C at Q/A 85-94; CX-1116; Hr’g Tr. at 72:15-73:12 (testimony that [REDACTED])). Further, the only evidence of the device’s functionality appears to be a video recording of that presentation,



Analysis of technical prong domestic industry is nearly identical to that of infringement. *Alloc*, 342 F.3d at 1375. In the more common domestic industry “exists” cases, the analysis involves a comparison between claim language and a product. It follows that in “in the process of being established” cases, the analysis should remain as a comparison between claim language and *future* product. While it may be true, as Samsung contends, that “[n]o Commission precedent has ever held a domestic industry being established absent at least some physical embodiment of the patent” (RIB at 120), the Commission has explicitly not foreclosed this approach to establishing technical prong domestic industry (Order No. 19 at 8 (citing *Thermoplastic Motors*, Inv. No. 337-TA-1073, Comm’n Op. at 11)).

Such a comparison shows that, at the time of the complaint, Dynamics was taking the necessary and tangible steps to practice claim 1 of the 545 patent with a significant likelihood of success. As a starting point, the January 2018 presentation at CES establishes a large measure of progress towards development of the Emirates NBD Device (referred to as Connected Wallet Card). *See generally* CX-1116. Importantly, to the extent they are not already present in the exhibited device, the presentation demonstrates an intention to include certain features in the Connected Wallet Card: “cellphone antenna” (CX-1116 at 19:40); “contactless, EMV Contract, and Magstripe” (*id.* at 27:30-40); “swipe or tap” (*id.* at 42:25-42:33). These align, respectively, with the main limitations of claim 1: “circuitry operable to communicate with a cellular network,” “RFID circuitry . . .,” and “a coil; . . . to electrically couple . . . and to communicate data in magnetic

which does not demonstrate magnetic stripe track data communication, among other things. CX-1116. The demonstrated device was apparently not preserved so as to be produced during discovery. RIB at 121 (“none of the pre-suit ‘prototypes’ on which Dynamics now relies was produced, even for inspection”), 122 (“Dynamics asserted that . . . ‘Dynamics was in possession of multiple working prototypes of the Connected Wallet Card’ . . . but those alleged ‘working’ prototypes were never produced, even for inspection, and are not in the record.”).

stripe data format . . . from a position beneath a surface of the device” in claim. 545 patent at cl. 1). The CES presentation also includes guest speakers that demonstrate real relationships within industry on both the vendor and customer levels, with continuing coordination and commitments. *See generally id.* (including CIBC, IndusInd, Sprint, Sumitomo, Visa). Dynamics’ contract with Emirates NBD, executed just prior to the presentation, similarly includes obligations for product features that match claim 1 of the 545 patent: “[a] remote download capability” so that payment accounts can be added remotely to the card and messages to be remotely sent to the card: and “[w]hen an account is selected, the associated account data will be provided to the stripe, EMV and contactless technologies.” CX-0046C at *19; *see* CX-0155C at *6 (defining Dynamics’ use of “contactless”), 39-44 (further explaining the three payment technologies); CX-0119C at *2 (similar agreement on functionality with C6 bank).

The record shows those efforts continued from early 2018 up to the filing of the complaint in mid-2019. There is no real dispute to Dynamics’ claim that “Mr. Weiner, Mr. Workley, and Mr. Mullen all testified that Dynamics’ Advanced Engineering and Core Engineering departments predominant focus in 2019 was getting the Connected Wallet Card fully operational” (CIB at 140 (citing CX-1200C at Q/A 11[1]-113; CX-1198C at Q/A 84, 99-132; CX-1197C at Q/A 13, 79, 85-88); *see* CX-1197C at Q/A 51, 58-66, 78-84; CX-0109C (April, 2019 schematic)) and that a detailed bill of materials was in place around May 21, 2019 (*id.* at 95 (citing CX-1198C at Q/A 98-103; CX-0755C at *2); *see* CX-0072C). Similarly, there is no dispute Dynamics maintains a workspace in its Cheswick, PA facility, with appropriate equipment and personnel, for conducting this development. *Id.* at 120 (citing CX-1200C at Q/A 42-47), 133 (citing, *inter alia*, CX-1202C at Q/A 120-121); CRB at 56-57.

[REDACTED]

Altogether, these are tangible and necessary steps to practice the claim. There is also a significant likelihood that the practice will occur. Again, the 2018 CES presentation credibly explains how the Emirates NBD device is Dynamics' latest product, incorporating the magnetic stripe track data communication (via a emulating coil) of previous models, and then adding cellular capability and a display. *See generally* CX-1116 (explaining CIBC, IndusInd, SMCC, and then Connected Wallet Card features); CX-1197C at Q/A 91. In this way, accomplishing the legacy magnetic emulator feature should be fairly expected. RFID, too, is its own standardized method of communication, and so its accomplishment is ordinary. CX-0155C at *6 (“‘Contactless’ is used to refer to a group of wireless based payment standards based upon ISO/IEC 14443. Contactless may implement any number of payment protocols such as: PayPass, payWave, ExpressPay.”); CX-1199C at Q/A 55 (testifying ISO 14443 is an RFID standard); RIB at 131. As to cellular communication, it is not disputed the CES presentation demonstrated communication over a similar, albeit different, pager network. *See* RIB 124-125 n.18 (citing CX-1197C at Q/A 68-69). Nevertheless, true cellular communication is standardized and success there should be likely given Dynamics' partnerships with cell network providers. *See, e.g.,* CX-1116 at 28:28-30:30; CX-1197C at Q/A 54, 62-66, 73-86. Samsung's expert admits it is merely “to get an off-the-shelf IoT modem to transmit a cellular signal like it was supposed to do. Dynamics did not make the modem; they bought it.” RX-1675C at Q/A 247; *see* CX-1198C at Q/A 111-115 (discussing off-the-shelf MSP processor); CX-0109C. To meet the technical prong, the cellular connection only has to work; it does not have to work well.

In sum, claim 1 of the 545 patent has five limitations. The first two require standard cellular and RFID communication. The final three are captured within Dynamics' well-honed magnetic stripe emulator system. Thus, given its experience and prior product lineup, Dynamics' likelihood

[REDACTED]

of practicing all of these features together in a single device (*i.e.*, practicing the claim) in mid-2019 is significant. And for claim 5, which adds the element of “further comprising a display operable to display a virtual payment card,” Dynamics refers to the 256x256 pixel screen on the Emirates NBD device and its imagery shown in CX-0656C. CIB at 97; *see* CRB at 60.

Samsung’s opposition here is not persuasive. Its points are either too generalized (RIB at 125 (arguing “any design” was “far from complete” and “highly speculative”), 126-127 (arguing the incorrectness of a 2018 claim that technology was complete shows it will never be); RRB at 59 (arguing “no evidence” to show future success when patent had not been practiced in past six years)), based in post-complaint evidence (RIB at 125-126 (discussing inadequacies of October 17, 2019 prototype), 126 (explaining impact of events following the complaint); RRB at 59-61 (discussing October 17, 2019 prototype)), or focused on capabilities that are not limitations of claim 1 and are therefore irrelevant (RIB at 127 (complaining of no “fully functioning Emirates NBD card” at the time of the complaint with insufficient battery life)).

Accordingly, the record supports finding technical prong of domestic industry under claims 1 and 5 of the 545 patent is “in the process of being established.”

F. Validity and Other Defenses

Samsung identifies the following invalidity theories for the 545 patent:

Claims	Theory
1, 3, 5	Anticipated under 35 U.S.C. § 102(a) and (b) by Pitroda (RX-0878)
1, 3, 5	Invalid under 35 U.S.C. §§ 102(f), 116 due to incorrect inventorship

See generally RIB at 127-133; RRB at 61-64. Pitroda is prior art to the 545 patent under 35 U.S.C. § 102, for the same reason it is prior art to the 100 patent.

1. Pitroda

In its initial brief, Samsung contends claims 1, 3, and 5 are anticipated by prior art reference Pitroda, as it “discloses, among other things, electronic devices with cellular, RFID, and magnetic emulation capabilities all in one device.” RIB at 127. Samsung notes, “[u]nlike the ’100 and ’631 patents, the ’545 patent does not require outside-the-reader emulation.” *Id.* at 128.

As for “circuitry operable to communicate with a cellular network,” Samsung points to disclosures of “wireless telephones” to satisfy the limitation. RIB at 130 (citing RX-0878 at 1:25-32, 2:3-6, 3:14-15). As for “RFID circuitry operable to electrically couple the device to a payment terminal and to communicate RFID data to the payment terminal,” Samsung points to disclosures of a POS interface comprising “a magnetic stripe emulator, a smart card emulator, or both,” where “smart card[s]” are those devices practicing the ISO 14443 standard—an RFID standard. *Id.* at 130-131 (citing, *inter alia*, RX-0878 at 2:46-50, 4:37-52, 8:54-9:61 1:12-14, 4:37-52, 5:44-49; CX-1199C at Q/A 55; Hr’g Tr. at 874:5-25). As for “a coil” and “a processor for controlling the operation of the coil such that the coil is operable to electrically couple the device to the payment terminal and to communicate data in magnetic stripe data format to the payment terminal,” Samsung points to Pitroda’s disclosures of a “magnetic stripe emulator may comprise at least one electromagnet” which interfaces with a point of sale system according to magnetic track data standards (*id.* at 131-132 (citing, *inter alia*, RX-0878 at 3:65-67, 8:14-21, 8:32-40, 11:29-31, 7:25-28, Figs. 12, 14, 20)). As for “wherein the coil is operable to electrically couple the device to the payment terminal from a position beneath a surface of the device,” Samsung points to disclosures that the POS interface is enclosed by a housing, and the POS includes the coil. *Id.* at 132 (citing,

[REDACTED]

inter alia, RX-0878 at 5:41-50, 8:26-32). As they are within the housing, reasons Samsung, they are “beneath a surface of the device.” *Id.*

As for “wherein the device is a portable telephonic device,” of claim 3, Samsung points to the same mention of “wireless telephones” discussed above. *See* RIB at 132. For “further comprising a display operable to display a virtual payment card” of claim 5, Samsung argues there is no dispute the limitation is met. *Id.* (citing RX-0878 at 2:11-17, 1:55-59, 4:37-52, 11:14-18; Hr’g Tr. at 892:6-15; RX-1677C at Q/A 396).

Samsung has shown anticipation of claim 1, 3, and 5 by Pitroda by clear and convincing evidence. The claims of the 545 patent are notably broad. While they recite the core functionality of magnetic emulation to communicate payment information (*i.e.*, a “coil,” “electrically couple,” “communicate data in magnetic stripe data format”), they do not place any further limits on how that is achieved other than an embedded coil (*e.g.*, no outside-the-reader range, or serial communication of multiple tracks). Instead, claim 1 adds RFID and cellular functionalities alongside the magnetic emulation, with each, again, unconstrained as to how they operate (*e.g.*, RFID circuitry to communicate RFID data). This makes the claim both easy to infringe and, conversely, to anticipate. *Upsher-Smith*, 412 F.3d at 1322.

Dynamics’ opposition is not persuasive. Its central focus is that Pitroda divides the recited functionalities of claim 1 (*e.g.*, cellular, magnetic emulation, RFID) between *two* devices—a central electronic device and an adapter (*see* CIB at 98-101; CRB at 61-63)—and this allegedly cannot infringe because the claim’s preamble “a device” is limiting (*see, e.g.*, CIB at 99 (“[The] contention that Pitroda’s device is capable of communicating with a cellular network is based on the incorrect premise that these two separate devices are a single device, which they are not.”)). It is not limiting, however, as determined above.



And even if limiting, Pitroda fairly discloses an embodiment where the adapter (*i.e.*, the POS interface circuit) is an “extension” of the overall “electronic transaction device” that itself may be a “Wireless Phone.” *See* RX-0878 at Abstract, 1:21-36, 1:60-2:6, 2:7-20 (“Electronic transaction devices may include additional features, such as wireless telephony and PDA features.”), 9:24-27 (“the adapter 10 may be configured as a lid or cover for an electronic transaction device, wired into the electronic transaction device, the cover being flipped open for use.”), 11:11-27. In addition, Pitroda teaches an embodiment where cellular circuitry, magnetic emulation, and “smart card” features are all in just the “adapter”:

Referring to FIG. 17, another alternative embodiment of the adapter 10 is illustrated. In this embodiment, both POS interface 20 a comprising electromagnets 30 and POS interface 20 b comprising a smart card interface 50 are incorporated on a single adapter 10. Additionally, a metallic interface for communicating with devices or networks other than POS terminals may be included. For example, interfaces for wired or wireless telephone circuits may be provided, as may be interfaces for LAN computer networks.

Id. at 9:7-15; *see id.* at 8:54-9:6 (discussing “smart card” interface as optionally practicing ISO 14443 RFID standard). So there is no merit to Dynamics’ assertions that, for example, “Pitroda does not teach that its adapter includes circuitry operable to communicate with a cellular network” (CIB at 100), “nothing in Pitroda indicates that its adapter can be ‘integrated’ into a cell phone, or could otherwise form a single device with that cell phone” (CRB at 61), and “in any embodiment in which Pitroda teaches an electronic transaction device being a cellular device, the adapter must be a separate device that is detachable from a cellular device” (*id.* at 63).

Given the above cited disclosures, Pitroda discloses an electronic transaction device that is a “wireless telephone” and thus meets the “circuitry operable to communicate with a cellular network” of claim 1 and “portable telephonic device” of claim 3. Pitroda also discloses “[e]xisting credit card (and other plastic card) images may be electronically stored and reproduced on the electronic transaction device display” (RX-0878 at 2:11-17) which clearly anticipates “a display

[REDACTED]

operable to display a virtual payment card” of claim 5 of the 545 patent. Dynamics’ opposition to these dependent claims is more of the same—“Pitroda . . . does not teach that its adapter becomes one device with a cell phone . . . [and it is a] flawed premise that anything Pitroda discusses as associated with a cell phone can be attributed to Pitroda’s device” (CIB at 101)—and contradicted by the evidence.

Accordingly, Pitroda anticipates claims 1, 3, and 5 of the 545 patent.

2. 35 U.S.C. §§ 102(f), 116 (Improper Inventorship)

Samsung argues “[t]he ’545 patent is invalid and unenforceable under 35 U.S.C. §§ 102(f) and 116 for the same reason as the ’100 patent.” RIB at 133 (citing RX-0006C at 153:22-156:23, 161:25-162:5); RRB at 63-64. As determined above, Samsung has not shown improper inventorship for either the 100 or 631 patents. Samsung offers no additional or tailored argument for the claims of the 545 patent. *See* RIB at 133; RRB at 63-64. Thus, its burden has not been met.

Accordingly, Samsung has not shown, by clear and convincing evidence, invalidity of any claim of the 545 patent for improper inventorship.

VIII. DOMESTIC INDUSTRY - ECONOMIC PRONG

In a patent-based complaint, a violation of Section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent ... concerned, exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). Under Commission precedent, this “domestic industry requirement” of Section 337 consists of an economic prong and a technical prong. *Stringed Instruments*, Inv. No. 337-TA-586, Comm’n Op. at 12-14. The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *See Certain Set-Top Boxes and Components Thereof*, Inv. No. 337-TA-454, Initial Determination at 294 (June 21, 2002) (not reviewed in relevant part).



The economic prong of the domestic industry requirement is defined in subsection (a)(3) of Section 337 as follows:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark or mask work concerned --

(A) Significant investment in plant and equipment;

(B) Significant employment of labor or capital; or

(C) Substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). The economic prong of the domestic industry requirement is satisfied by meeting the criteria of any one of the three factors listed above. Importantly, the Commission has clarified that investments in plant and equipment, labor, and capital that may fairly be considered investments in research and development are eligible for consideration under subsections (A) and (B), in addition to subsection (C). *See Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm’n Op. at 14 (June 29, 2018) (“*Solid State Storage*”).

Dynamics contends economic prong is met under subsections (A) and (B) through its investments “dedicated to its CIBC, IndusInd, SMCC, and Connected Wallet (also referred to as ‘Emirates NBD’) cards” at locations in Cheswick, PA and Tennessee. CIB at 109-110. Although not squarely stated, the alleged domestic industries for the 153, 100, and 631 patents are implied in Dynamics’ briefing to presently “exist[]” under the statute (*see* 19 U.S.C. § 1337(a)(2)); whereas the industry for the 545 patent is alleged to “exist[]” and also be “in the process of being established” (*see* CIB at 139 (“To the extent . . . activities set forth above do not establish the existence of a current domestic industry in [the Connected Wallet Card], the evidence shows a

[REDACTED]

domestic industry in the process of being established.”); *see also* CRB at 66 (header stating, “There is an Existing Domestic Industry (’153, ’100, ’631, and ’545 Patents)’)).

As determined above, however, the Emirates NBD article (with basic emulator or cellular functionality) was not found to exist or have existed by the time of Dynamics’ complaint. Thus, there can be no domestic industry for the 545 patent that “exists,” and only whether there is an industry “in the process of being established” for that patent is considered. For the 153, 100, and 631 patents, it is considered whether domestic industries “exist.”

Further, as discussed above, the technical prong of domestic industry has not been shown, on the merits, for the 153 or 631 patents or for several products under the 100 patent. Nevertheless, to aid the Commission’s analysis of economic prong, those allegations are treated as established; and for the reasons below, it is determined Dynamics has shown “significant” investment for the 153, 100, and 631 patents under subsections (A) and (B). Should the above technical prong determinations be accepted, then only the 100 patent meets economic prong under the same subsections. Lastly, Dynamics has not shown an industry “in the process of being established” for the 545 patent under economic prong.

A. Domestic Industry in Existence

1. Qualifying Expenditures

As noted above, Dynamics claims economic prong is met by industries that “exist” for the 153, 100, and 631 patents through activities that take place in Dynamics’ headquarters in Pennsylvania and another location in Tennessee. *See* CIB at 109-110 (citing, *inter alia*, CX-1202C at Q/A 17, 40; CX-1200C at Q/A 76). In this effort, Dynamics divides its activities and investments into two categories: 1) production (“Production”); and 2) and engineering, research, and development (“ER&D”). *See id.* at 110-116.

[REDACTED]

As to production, Dynamics explains it “uses approximately [REDACTED] square feet of its Cheswick headquarters to produce and personalize its cards (‘the Production Area’).” CIB at 110 (citing CX-1202C at Q/A 40). Dynamics argues “commercial volumes” of the CIBC and IndusInd cards are manufactured here and in this way. *Id.* (citing CX-1200C at Q/A 53; CX-1201C at Q/A 15-18; CX-1202C at Q/A 43, 112). Production and personalization are also explained as including receiving and inspecting shipped components, assembly, programming, calibration, printing, quality checking, among other activities. *See generally id.* at 110-113 (citations omitted). Only limited personalization activities take place for the IndusInd card, however, as local law requires loading sensitive information onto the card in India. *Id.* at 112 (citing CX-1201C at Q/A 35-38).

As to ER&D, Dynamics explains “[a]s of June 30, 2019, Dynamics employed [REDACTED] full-time employees in the United States dedicated to payment card ER&D.” CIB at 113-114 (citing CX-1202C at Q/A 161). This ER&D includes design, improving the technologies already present in Dynamics’ cards, production planning, manufacturing refinement, and tool manufacture, among other activities. *See generally id.* at 114-116 (citations omitted). Importantly, and for the purposes of showing economic prong in this investigation, Dynamics has divided its relevant ER&D activities into four categories: 1) improving magnetic emulation (“Emulation”); 2) developing cellular capabilities (“Cellular”); 3) improving manufacturing processes (“Manufacturing”); and 4) project-specific, or miscellaneous (“Project Specific”). *Id.* at 121 (citing CX-1200C at Q/A 101).

a. Subsection (A) – Plant and Equipment

Considering subsection (A), “significant investment in plant and equipment,” Dynamics argues its Cheswick, PA facility was purchased in 2011 for \$[REDACTED] and depreciates on a 39 year schedule at about \$[REDACTED] per year. CIB at 117 (citing CX-1200C at Q/A 30-32; CX-0173 at *3; CX-0030C at *9, 13). As for maintenance, upkeep, utilities, and other facility expenses,

[REDACTED]

Dynamics explains these are tracked in its financial records and reported by its expert, Mr. Thomas. CIB at 117-118 (citing CX-1202C at Q/A 35-38; CX-0829C).

The amount of these facility attributable to card Production activities is estimated by Mr. Thomas, using square footage as an allocation, at approximately [REDACTED] *Id.* at 118; *see* CX-1202C at Q/A 39-40. Dynamics adds a variety of equipment expenses “dedicated to the Production Area” as well. *See id.* at 119 (citing CX-1200C at Q/A 33-36, 48-51, 58-59, 61-65, 67-68; CX-1202C at Q/A 39-54; CX-0800C at *4). The resulting Production investments are reported as:

Table DI-1 (Excerpt of CDX-1202.4C)					
Dynamics’ Domestic Plant and Equipment Investments Allocable to CIBC and IndusInd Production and Personalization					
	2016	2017	2018	July 12, 2019	Oct. 31, 2019
CIBC (’100 and ’631 patents)	[REDACTED]				
IndusInd (’153, ’100, and ’631 patents)					

CIB at 120.

As for ER&D, Dynamics argues there is “a dedicated portion of the Cheswick Facility to perform these activities” in addition to an office in Tennessee, with a \$ [REDACTED] annual lease. CIB at 120 (citing, *inter alia*, CX-1200C at Q/A 42-47, 55-57, 66)). Mr. Thomas again uses a square footage percentage for the Cheswick facility to allocate plant and equipment expenses—around [REDACTED]. *Id.* at 121 (citing CX-1202C at Q/A 60-62). Thereafter, Dynamics again adds “non-capital facility expenses,” “depreciation of capital equipment,” and “non-capital supplies.” *Id.* (citing CX-1200C at Q/A 37-39, 48-52, 58-68).

Dynamics and Mr. Thomas then proffer two schemes of additional allocations to arrive at investments “attributable to a particular Dynamics card.” CIB at 122 (citing CX-1202C at Q/A 60-77). In its first approach, Dynamics divides its ER&D plant and equipment investments between the four categories of Emulation, Manufacturing, Cellular, and Project Specific. CIB at

[REDACTED]

122-123 (citing CX-1202C at Q/A 60-77; CX-0854C). This is done according to estimates of the amount of time spent in each category provided by Dynamics' CFO, Mr. Weiner. *Id.* at 122 (citing CX-1200C at Q/A 102-107; CX-0855C), 122-123 (citing CX-1202C at Q/A 60-77; CX-0854C). Then, "Mr. Thomas applied the resulting technical expenditures to the specific Dynamics cards that implement each technology" (*id.* at 123) such that if any of the CIBC, IndusInd, SMCC, or Connected Wallet Card arguably benefit from Emulation, Manufacturing, Cellular, and Project Specific, then the *entire* investment in Emulation, Manufacturing, Cellular, and Project Specific is counted towards the product (*id.* (citing CX-1202C at Q/A 78-80; CX-0856C)).

On this point, specifically, Dynamics does not explain, but Mr. Thomas testified to an understanding, that Manufacturing ER&D "relate[s] to and [is] implemented into [REDACTED]"; Emulation ER&D "relate[s] to and [is] implemented into at least the [REDACTED] cards"; and Cellular ER&D is "currently implemented into the Emirates NBD card." CX-1202C at Q/A 78. The last category, Project Specific ER&D, is treated differently with varying percentages of the whole (instead of all or nothing) allocated between the DI Products, each year (*e.g.*, in 2017, [REDACTED] of expenses attributed to SMCC, [REDACTED] to CIBC, [REDACTED] to IndusInd, [REDACTED] to Emirates NBD). *Id.*

Under this approach, the resulting total ER&D plant and equipment expenses for each DI Product are reported as:

[REDACTED]

Table DI-2 (Excerpt of CDX-1202.7C)					
Dynamics' Domestic Plant and Equipment Investments Related to Technologies Incorporated into Specific Cards					
	2016	2017	2018	July 12, 2019	October 31, 2019
CIBC ('100 and '631 patents)	[REDACTED]				
IndusInd ('153, '100, and '631 patents)					
SMCC ('153, '100, and '631 patents)					
Connected Wallet (all patents)					

Id. Dynamic argues repeatedly assigning the same expenditure to multiple products is an appropriate Section 337 practice. *See id.* at 123-125 (citing, *inter alia*, *Certain Microlithographic Machines and Components Thereof*, Inv. No. 337-TA-468, Initial Determination at 365-366 (Jan. 29, 2003) (not reviewed); *Certain LED Lighting Devices, LED Power Supplies, and Components Thereof*, Inv. No. 337-TA-1081, Initial Determination at 140-141 (Dec. 19, 2018)).

In a second approach, which Dynamics argues is not necessary, the Emulation and Manufacturing expenses are not assigned *in toto* to multiple DI Products, but allocated between them according to how many there are—resembling what had originally been done for Project Specific and Cellular ER&D. *See* CIB at 125 (citing CX-1202C at Q/A 85-91). More specifically, Mr. Thomas testifies that Emulation ER&D benefits [REDACTED] products ([REDACTED] DI Products, and [REDACTED] [REDACTED] (*see* CX-1202C at Q/A 87)) and so the Emulation ER&D expense total for each year (CX-0854C) is divided [REDACTED] ways. Manufacturing ER&D benefits [REDACTED] products ([REDACTED] DI Products and [REDACTED]), and so each year's total expense is divided [REDACTED] ways. When this approach is followed, Dynamics reports the per-card investment totals (along with per-patent totals) as:

Table DI-3 (Excerpt of CDX-1202.8AC)					
Dynamics' Domestic Plant and Equipment Investments Related to Technologies Allocated to Specific Cards on a Card-By-Card Basis					
	2016	2017	2018	July 12, 2019	Oct. 31, 2019
CIBC					
IndusInd					
SMCC					
Connected Wallet					
'100 and '631 patents					
'153 patent					
'545 patent					

CIB at 125.

Subject to certain findings below, Dynamics' figures as contained in Tables DI-1 and DI-3 are sufficiently reliable and accepted for purposes of determining whether the domestic industry is significant.³ The size of the Cheswick facility, its value and upkeep expenses, and the fact that commercial volumes of CIBC and IndusInd cards are produced there comes from credible testimony and stands largely undisputed by Samsung. CX-1202C at Q/A 38, 54, 59; CX-1200C at Q/A 25-68. As these are the primary figures underlying Dynamics' Production plant and equipment expenses, those expenses are sufficiently established.

Dynamics' ER&D plant and equipment expenses are slightly more suspect, but the record does not support ignoring them outright. The ER&D figures come from reliable business records along with the testimony of Dynamics' CFO, Mr. Weiner, who credibly explained the bases for the amounts of time attributable to Emulation, Cellular, Manufacturing, and Project Specific ER&D efforts. CX-1202C at Q/A 60-77; CX-1200C at Q/A 25-68.

³ Order No. 18 explains why facility and equipment asset value must be allocated between appurtenant products, and not counted in full more than once, as in Table DI-2. Order No. 18 at 4-5. Dynamics' expert, Mr. Thomas, recognizes this as well. CX-1202C at Q/A 81-83.

[REDACTED]

One deficiency in Dynamics’ presentation of these expenses, however, is the extent to which they properly exclude Dynamics’ non-payment card research and development. *See, e.g. Certain Subsea Telecommunication Systems and Components Thereof*, Inv. No. 337-TA-1098, Comm’n Op. at 41 (Oct. 21, 2019) (“The Commission has found that complainants have not satisfied the domestic industry requirement where the complainant failed to allocate expenses to account for non-domestic industry products that do not practice the patent.”). Documents such as a 2018/2019 board presentation (CX-0020C; RX-0143C) and revenue spreadsheet (CX-0201C), discussed by Mr. Weiner (CX-1200C at Q/A 94-96), demonstrate that Dynamics conducts non-payment card business such as software and loyalty programs (*see, e.g., id.* at Q/A 3; RX-0623C (listing “Mobile and Digital Payment Services”)). Yet the records which form the basis for Dynamic’ overall ER&D amounts (CX-1202C at Q/A 77; CDX-1202.6C; CX-0854C; CX-0055C) are not clearly limited to payment card activities.

For example, CX-0100C appears to be a spreadsheet of expenses for Dynamics as a whole, per department code, but Mr. Thomas uses its figures as if they are limited to payment card-only ER&D. *See* CX-1202C at Q/A 71; *compare* CX-0854C (column “Plant & Equipment Investments by Department”) *with* CX-0100C (each tab, “Supplies and Equipment Total” and “Facilities/IT total”). CX-0055C (a.k.a. RX-0646C), a listing of capital equipment value, similarly appears to apply to all of Dynamics, but it is attributed in this investigation to just payment cards. CX-1202C at Q/A 67-68. Finally, building and facility expenses are allocated based on square footage of rooms simply labeled “non-manufacturing” (*see id.* at 62; CX-1200C at Q/A 44-46), which could conceivably include software and loyalty ER&D. Nevertheless, this is not an issue discussed by Samsung, and the record is not so clear as to dismiss all of Dynamics’ calculations as unreliable.

[REDACTED]

A potentially related shortcoming involves Mr. Thomas's one-quarter and one-fifth allocations for Emulation and Manufacturing ER&D categories, discussed above. As he explains, he assigned one-quarter of Emulation expenses because (at the time—the C6 card has since been excluded from consideration towards domestic industry) he believed there were four domestic industry products in the investigation. CX-1202C at Q/A 87. Similarly, he assigned one-fifth of Manufacturing expenses because (again, the C6 has since been rendered ineligible) he believed there were five domestic industry products. *Id.* He explains this is appropriate because several domestic industry products have never been commercially produced, so manufacturing numbers (*i.e.*, those used to allocate Production expenses) are inappropriate. *Id.* at 88.

This is not sound reasoning, however. While the number of cards produced may not be an appropriate allocation for cards still in development (*e.g.*, SMCC and Emirates NBD), that does not make blanket one-quarter or one-fifth allocations proper. These ratios seem to have been selected simply based on the number of DI Products Mr. Thomas believed were in the case. Thus, the allocations do nothing to accommodate and exclude any non-DI Products in Dynamics' collection of payment cards. This is important because Dynamics' records suggest such cards exist, including "ePlate," [REDACTED] [REDACTED] and [REDACTED] models (*see* CX-0020C at *19, 22, 27; RX-0020C at 25:25-26:6 (production manager, Mr. Mazock, indicated awareness of a [REDACTED] [REDACTED] not listed on CX-0020C at *22); CX-0201C at Tab "Rev by Type"; RX-0623C; Hr'g Tr. at 782:6-783:8, 788:6-15, 789:7-18;); and Dynamics asserts that it incorporates technology developed for one card product into others as appropriate (CRB at 70 (citing, *inter alia*, CX-1198C at Q/A 133; CX-1200C at Q/A 97-99, 109); CX-1200C at Q/A 109-110). Surprisingly, and despite Samsung's assertions on the existence of the [REDACTED] neither Dynamics nor its witnesses' written testimony make mention of the [REDACTED] at all. *See generally* CIB; CRB; CX-

[REDACTED]

1202C; CX-1200C; CX-1198C; CX-1197C at Q/A 54 (citing, but not discussing, Aozora agreements).

Nevertheless, it is not possible to reliably ascertain from the record what impact Dynamics' failure to exclude the [REDACTED] or any other non-DI Products, has on the calculus. As mentioned, Dynamics' witnesses are silent on the issue; and while Samsung's economic expert, Ms. Mulhern, mentions the [REDACTED] card, among others, multiple times as reason to discount all of Dynamics' figures (RX-1678C at Q/A 24, 39, 45-54), she does not actually opine that the quantitative investment behind [REDACTED] was so material or meaningful as to make a difference (see RX-1678C at Q/A 24, 39, 45-54; Hr'g Tr. at 782:6-783:8, 788:6-15, 789:7-18). Even if this intent is assumed, no evidence or quantitative figures are discussed. Such general assertions of unreliability are not persuasive in light of the Commission's flexibility with economic prong allocations. *See, e.g., Magnetic Data Storage*, Inv. No. 337-TA-1012, Comm'n Op. at 114-116; *Carburetors*, Inv. No. 337-TA-1123, Comm'n Op. at 9-10; *Solid State Storage*, Inv. No. 337-TA-1097, Comm'n Op. at 17-21 ("Other than averring that Mr. Uriarte's estimate of the amount of time BNI's employees spend working on Altima I is unreliable due to lack of documentary corroboration, Respondents did not provide specific persuasive evidence showing that Mr. Uriarte's time estimates for Altima I are unreliable"); *see generally* 19 C.F.R. § 210.37(a) ("The proponent of any factual proposition shall be required to sustain the burden of proof with respect thereto.")

Samsung's other points of opposition fare similarly, or are otherwise not persuasive. For example, Samsung argues certain capital equipment may, given the vendor name ("[REDACTED] [REDACTED]") actually be located outside the United States. RIB at 137 (citing RX-1678C at Q/A 62-64; RX-0646C;). This is not an unreasonable proposition, but Samsung does not explain why or how this constitutes a material difference. *See*

[REDACTED]

Certain Movable Barrier Operator Systems and Components Thereof, Inv. No. 337-TA-1118, Comm’n Op. at 26 n.10 (Jan. 12, 2021) (acknowledging that foreign costs may be useful and relevant, but holding the absence of that information does not preclude economic prong when “there is nothing to suggest that the consideration of [such costs] would lead to the conclusion that CGI’s domestic investments were not significant”). Indeed, according to Dynamics’ calculations, all capital equipment, whether domestic or overseas, comprises only around [REDACTED] of Dynamics’ total domestic ER&D plant and equipment. CX-0854C (“Lab Equipment”).

Samsung also argues that two of the four DI Products (SMCC and Emirates NBD) should not be counted in any amount for any patent because only the CIBC and IndusInd cards were “in existence at the time of the complaint.” RIB at 135-136; RRB at 71 (“the SMCC and Connected Wallet Card—have never been manufactured and are still, at best, products in development”). But the absence of an Emirates NBD device has already been taken into account and Samsung’s expert admits the SMCC card was produced in discovery to experiment with outside-the-reader communication. RX-1675C at Q/A 202-203; RDX-1065C; RPX-0035. Samsung does not contend that the sample was in any way manufactured after the filing of the complaint, as was the case with the October 17, 2019 Emirates NBD device. To the extent Samsung advances the point, the Commission does not require domestic industry articles to be commercialized. *Certain Non-Volatile Memory Devices and Products Containing the Same*, Inv. No. 337-TA-1046, Comm’n Op. at 41-42 (Oct. 26, 2018)).

Specific to Production expenses, Samsung complains that Dynamics divides them between only the CIBC and IndusInd cards, thereby “ignoring the use of the facility for products in development.” RIB at 136-137 (citing, *inter alia*, RX-1678C at Q/A 38-41); RRB at 72. Respondents cite no evidence to show that more than a *de minimis* amount of cards, still in

development, were produced as compared to the tens of thousands of CIBC and IndusInd. CX-0800C at *3; CX-0167; RX-1678C at Q/A 39 (describing “prototype and marketing cards”). Again, the Commission’s flexible analysis allows for such minimal activities to be disregarded for calculation simplification. CIB at 119-120 (citing *Magnetic Data Storage*, Inv. No. 337-TA-1012, Comm’n Op. at 114).

Lastly, a large portion of Samsung’s briefing is dedicated to the “multiple model” double-counting of Manufacturing and Emulation ER&D expenses under Mr. Thomas’s first approach. *See* RIB at 133, 135-136, 138-139; RRB at 72. Yet this is, as Dynamics argues, irrelevant given Mr. Thomas’s second approach, adopted here, which divides Manufacturing and Emulation expenses across card models. CRB at 70 (“Samsung ignores Mr. Thomas’ alternative analysis.”).

Nonetheless, the Emirates NBD device, which was not in existence prior to the complaint, is not eligible to contribute to domestic industry for the 153, 100, and 631 patents. Thus, with the assumption that all other technical prong claims are satisfied, Dynamics’ expenditures at the filing of the complaint and for purposes evaluating significance under subsection (A) are⁴:

Subsection (A) – Plant and Equipment (Domestic)					
	2016	2017	2018	July 2019	Total
Production (Table DI-1)					
CIBC					
IndusInd	-	-			
ER&D (Table DI-3)					
CIBC					
IndusInd					
SMCC					
Product Totals					

⁴ Dynamics indicates in its discussions of significance and Table DI-3, that values for products should be added together to determine investment per patent. *See, e.g.*, CIB at 127, 129.

CIBC	\$ [REDACTED]
IndusInd	\$ [REDACTED]
SMCC	\$ [REDACTED]
Patent Totals	
153 patent	\$ [REDACTED]
100 patent	\$ [REDACTED]
631 patent	\$ [REDACTED]

b. Subsection (B) – Labor and Capital

Considering subsection (B), “significant employment of labor or capital,” Dynamics argues the labor behind its Production and ER&D efforts is also significant. CIB at 131. Dynamics explains “[a]s of July 12, 2019, [it] employed [REDACTED] individuals at its U.S. facilities and [REDACTED] individuals overseas,” in addition to temporary contract labor from time to time. *Id.* (citing CX-1200C at Q/A 72-79, 83-84). The expenses behind this labor force, allegedly include salaries, benefits, and other attributable expenses tracked in Dynamics’ accounting system. *Id.* at 131-132 (citing CX-1200C at Q/A 82-86).

To arrive at labor costs directed to the asserted patents under Production, Dynamics begins with total labor costs from the relevant departments, and allocates them between the IndusInd and CIBC cards based on production volume—in the same manner as plant and equipment. RIB at 132 (citing, *inter alia*, CX-1202C at Q/A 112-117; CX-0859C). The result is as follows:

Table DI-4 (Excerpt of CDX-1202.13C)					
Dynamics’ Domestic Employment of Labor Allocable to CIBC and IndusInd Production and Personalization					
	2016	2017	2018	July 12, 2019	Oct. 31, 2019
CIBC (‘100 and ‘631 patents)	[REDACTED]				
IndusInd (‘153, ‘100, and ‘631 patents)					

Id. As for ER&D labor, Dynamics again starts with labor costs from the relevant departments (RIB at 133 (citing CX-1202C at Q/A 120-121)) and employs the same allocation across Emulation, Cellular, Manufacturing, and Project Specific ER&D categories as in the second approach in subsection (A) (*id.* at 134-135 (citing, *inter alia*, CX-1202C at Q/A 128-132, 105). The result is as follows:

Table DI-6 (Excerpt of CDX-1202.17AC)					
Dynamics' Domestic Employment of ER&D Labor on a Card-By-Card Basis					
	2016	2017	2018	July 12, 2019	Oct. 31, 2019
CIBC					
IndusInd					
SMCC					
Connected Wallet					
'100 and '631 patents					
'153 patent					
'545 patent					

Id.

For the same reasons discussed under subsection (A), these figures are sufficiently reliable to evaluate for significance under subsection (B). Dynamics' allocation of ER&D categories amongst products avoids double-counting and has not otherwise been shown to be materially incorrect; and Samsung does not offer any criticisms, specific to subsection (B), not already addressed. *See* RIB at 133-139; RRB at 71-73. Thus, with the removal of the Emirates NBD device from the calculus, and the assumption that all other technical prong contentions are satisfied, Dynamics' expenditures at the filing of the complaint and for purposes of evaluating significance under subsection (B) are⁵:

Subsection (B) – Labor and Capital (Domestic)
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⁵ Dynamics indicates in its discussions of significance and Table DI-6, that values for products should be added together to determine investment per patent. *See, e.g.*, CIB at 136, 138.

	2016	2017	2018	July 2019	Total
Production (Table DI-4)					
CIBC	\$				
IndusInd	-	-	\$		
ER&D (Table DI-6)					
CIBC				\$	
IndusInd				\$	
SMCC				\$	
Product Totals					
CIBC				\$	
IndusInd				\$	
SMCC				\$	
Patent Totals					
153 patent				\$	
100 patent				\$	
631 patent				\$	

2. “Significant” or “Substantial”

The next step in the evaluation of domestic industry is to determine if the investment amounts identified above are “significant,” as in subsections (A) and (B), or “substantial,” as in subsection (C). The most recent precedential decision by the Court of Appeals for the Federal Circuit addressing this determination is *Lelo*, which restated law applicable to a number of issues surrounding the economic prong of domestic industry. *See* 786 F.3d at 883-85. In particular, the Federal Circuit held that the statutory terms “‘significant’ and ‘substantial’ refer to an increase in quantity, or to a benchmark in numbers,” and “[a]n ‘investment in plant and equipment’ therefore is characterized quantitatively, *i.e.*, by the amount of money invested in the plant and equipment.” *Lelo*, 786 F.3d at 883. Continuing, the Federal Circuit held “[a]ll of the foregoing requires a quantitative analysis in order to determine whether there is a ‘significant’ increase or attribution

[REDACTED]

by virtue of the claimant’s asserted commercial activity in the United States.” *Id.* In short, “[q]ualitative factors cannot compensate for quantitative data that indicate insignificant investment and employment.” *Id.* at 885. The Commission has since made clear that some sort of comparative analysis must be made before significant or substantial can be found. *See, e.g., Certain Gas Spring Nailer Products and Components Thereof*, Inv. No. 337-TA-1082, Notice of Comm’n Determination at 3 (Dec. 12, 2019) (“*Gas Spring Nailers*”); *Certain Carburetors and Products Containing Such Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 17-19 (Oct. 28, 2019) (“*Carburetors*”).

a. Subsection (A) – Plant and Equipment

Dynamics presents several contexts to show the alleged significance of its investments under subsection (A). First, Dynamics compares the investments calculated above to its own total domestic plant and equipment expenses of approximately \$ [REDACTED] from 2016-July 2019. CIB at 126-127 (citing CX-1202C at Q/A 94). Dynamics argues the CIBC, IndusInd, and SMCC product investments presented above (Tables DI-1, DI-3) represent 27.9%, 10.6% and 8% of this total across the same timeframe. *Id.* at 127 (citing CX-1202C at Q/A 85). Dynamics contends it is appropriate to add together the percentages for those products that have been found to practice each patent, and when done, significance is evident. *See generally id.*

In another context, Dynamics compares the same plant and equipment expenses to foreign plant and equipment. CIB at 127-129. Dynamics provides two approaches, one with only its own expenses considered, and another adding payments to [REDACTED] its vendor in [REDACTED] which produces unfinished payment cards, among other things. *See id.* For Dynamics’ own expenses, it argues “Mr. Thomas used CX-0204C and CX-0100C to determine that Dynamics’ foreign plant and equipment expenses were \$ [REDACTED] in 2016, \$ [REDACTED] in 2017, \$ [REDACTED] in 2018. In 2019, those expenses were \$ [REDACTED] 2 through July 12.” *Id.* at 128 (citing CX-1202C at Q/A 97-

100; CX-1201C at Q/A 8; CX-0800C at *13). Dynamics argues “Mr. Thomas used CX-0033C, CX-0105C, and CX-0197C to determine that Dynamics’ purchase commitments to [REDACTED] for unfinished payment cards were \$ [REDACTED] in 2016, \$ [REDACTED] in 2017, \$ [REDACTED] in 2018, and \$ [REDACTED] from January through July 12, 2019.” *Id.* at 128 (citing CX-0892C; CX-1202C at Q/A 101-102). These figures are summarized as follows:

Subsection (A) – Plant and Equipment (Foreign)					
	2016	2017	2018	July 2019	Total
Dynamics’ P&E	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED] “P&E”	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total (Dynamics + [REDACTED])	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

See CX-0892C. Dynamics asserts the [REDACTED] amounts overstate [REDACTED] plant and equipment expenses because these payments reflect [REDACTED] market price, which includes its profit margin” (*id.* (citing CX-1202C at Q/A 102)) and refers to its expert’s testimony to explain why the domestic investment is significant in this context (*id.* at 129 (citing CX-1202C at Q/A 85, 102-103)).

In two final contexts Dynamics contends the value added by its U.S. operations “is significant in comparison to the total card conversion costs and total card costs,” based on data contained in a board presentation. CIB at 129 (citing CX-0020C; CX-1202C at Q/A 145-158; Hr’g Tr. at 163-164); *see* CX-0893C. Dynamics also contends there is qualitative significance because its domestic plant and equipment “are critical to the development and production of those products and add significant value to the products.” *See generally* CIB at 130-131 (citing CX-1202C at Q/A 106, 158, 161; CX-1201C at Q/A 19, 20, 26, 17, 30).

[REDACTED]

Samsung begins its opposition by restating that Dynamics has overestimated its domestic investments, and claiming that all but the conversion cost-context, summarized above, are “meaningless comparisons.” *See* RIB at 139-140; *see id.* at 140 n.21 (“relative concentration of a domestic industry product to the complainant’s product offerings is [] inappropriate . . . would punish diversified companies and provide undeserved benefit to complainants with fewer product lines.”). As to conversion costs, Samsung argues Dynamics “mischaracterizes the share of domestic internal conversion costs for the CIBC and IndusInd cards.” *Id.* at 140 (citing RX-1678C at Q/A 65-83). More specifically, and with particular respect to the IndusInd product, Samsung contends the board presentation (CX-0020C; RX-0143C) is a poor substitute for actual cost of production data; and, regardless, shows “the value added by domestic activities is quantitatively insignificant” (RIB at 141).

The record supports finding significant investment in plant and equipment for each of the 153, 100, and 631 patents under Dynamics’ comparisons to foreign investment. Samsung does not challenge Dynamics’ estimates as to its own foreign P&E or the propriety of using payments to [REDACTED] as a surrogate for actual facility and equipment costs. With these figures in hand, the domestic investments are \$ [REDACTED] for the 153 patent, \$ [REDACTED] for the 100 patent, and the same \$ [REDACTED] for the 631 patent. When each is added to the total foreign plant and equipment *estimate* of \$ [REDACTED], the resulting domestic as a percentage of total becomes 34.4%, 56.6%, and 56.6% for each patent, respectively. The more-than-half value added by the domestic plant and equipment for the 100 and 631 patents is certainly significant, as is the roughly one-third value added for the 153 patent under the test promulgated by *Lelo*.

One possible impediment to this determination is that the true value of [REDACTED] plant and equipment, properly allocated to the CIBC, IndusInd, and SMCC cards is unknown and could

[REDACTED]

conceivably be higher than Dynamics' payments. Without evidence in the record here, however, this is purely speculation, and discovery from a foreign non-party supplier may have been difficult for this investigation.

Samsung's reference to the 2018 board presentation and low internal conversion costs is not wholly without merit, either. A [REDACTED] added value from "internal" or domestic activity would likely not be considered significant. *See* CX-0020C at *25; CX-0893C. Neither party has adequately explained, however, where the "conversion" cost figures come from (*e.g.*, whether they incorporate plant and equipment fixed costs or represent variable costs), or how they may be more or less probative of economic prong domestic industry than the approach taken above (*i.e.*, documented facility and equipment costs, allocated across products).

Accordingly, the balance of the evidence in this investigation supports finding economic prong domestic industry met under subsection (A) for the 153, 100, and 631 patents under Dynamics' allegations of technical prong.

Further, should the above determinations regarding technical prong domestic industry be accepted—*i.e.*, that no products have been shown to practice the 153, 100, or 631 patents save the CIBC card and the 100 patent—then economic prong is met only for the 100 patent. In this circumstance, the \$ [REDACTED] domestic plant and equipment investment equates to around 44% of worldwide value add. This absolute amount and conservative percentage⁶ would not be considered insignificant or "modest." *Carburetors*, Inv. No. 337-TA-1123, Comm'n Op. at 17, 24 (citing *Lelo*, 786 F.3d at 885).

⁶ This is conservative because it assumes all \$ [REDACTED] in foreign costs over 2016-July 2019 are for the CIBC card, when in reality some are for the IndusInd. *See* CX-0800C at *3.

b. Subsection (B) – Labor and Capital

Dynamics’ presentation of significance under subsection (B) mirrors that given for subsection (A). First, Dynamics compares the labor investments calculated above to its own total labor costs of approximately \$ [REDACTED] from 2016-July 2019. CIB at 135 (citing CX-1202C at Q/A 135; CX-00894C – CX-0897C). Dynamics argues the CIBC, IndusInd, and SMCC investments presented above (Tables DI-4, DI-6) represent 4.2%, 11.1%, and 8.8% of this total across the same timeframe. *Id.* at 136 (citing CX-1202 at Q/A 85, 105). Again, Dynamics contends it is appropriate to add together the percentages for those products that have been found to practice each patent, and when done, significance is evident. *See generally id.*

In the next context, Dynamics compares the same calculated, domestic, labor expenses to foreign labor. CIB at 136-138. Dynamics provides two approaches, one with only its own foreign expenses considered, and another with the same purchase commitments to [REDACTED] added on. *Id.* For its own expenses, Dynamics reports, “Mr. Thomas used CX-0204C and CX-0100C to determine Dynamics’ total foreign labor expenses were \$ [REDACTED] in 2016, \$ [REDACTED] in 2017, and \$ [REDACTED] in 2018. In 2019, those expenses were \$ [REDACTED] through July 12.” *Id.* at 136-137 (citing CX-1202C at Q/A 138-139; CX-0898C). For payments to Able, the same amounts referenced above are used. Altogether, the figures are as follows:

Subsection (B) – Labor or Capital (Foreign)					
	2016	2017	2018	July 2019	Total
Dynamics’ Labor	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED] “Labor”	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]

Total (Dynamics + [REDACTED])	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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See CX-1202C at Q/A 157; CDX-1202.21C. Finally, Dynamics contends, again, qualitative significance because its domestic plant and equipment “are critical to the development and production of those products and add significant value to the products.” See generally CIB at 138-139.

Samsung’s arguments in opposition to significance are largely discussed above as they are not particular to either subsections (A) or (B). See generally RIB at 139-142; RRB at 71-73. And as determined above, they do not outweigh the otherwise reliable evidence under the Commission’s flexible economic prong standard.

The record supports finding significant investment in labor and capital for each of the 153, 100, and 631 patents under Dynamics’ comparisons to foreign plant and equipment—with modification.⁷ Although not discussed in the parties’ briefs, Dynamics’ expert, Mr. Thomas,

⁷ Dynamics alternatively argues the investments are significant because it “derives a significant portion of its revenues from sales of its domestic industry cards.” CIB at 138 (citing). While the Commission has accepted this context in the past, the question is really not how important the DI Product is to the complainant—but how important the United States is to the DI Product. *Lelo*, 786 F.3d at 883 (“All of the foregoing requires a quantitative analysis in order to determine whether there is a “significant” increase or attribution by virtue of the claimant's asserted commercial activity in the United States”); see, e.g., *Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 18 (providing examples of domestic-to-foreign and “value added to the product from a complainant’s activities in the United States” analyses); *Certain Tobacco Heating Articles and Components Thereof*, Inv. No. 337-TA-1199, Notice at 2-3 (Feb. 18, 2021) (supplementing economic reasoning to add significance based on context of domestic operations as compared to worldwide operations); *Certain Movable Barrier Operator Systems and Components Thereof*, Inv. No. 337-TA-1118, Separate Views of Chair Kearns Regarding Economic Prong Issues at 1-3 (Jan. 12, 2021) (discussing importance of considering domestic and foreign expenditures related to the domestic industry products).

[REDACTED]

testifies that the work performed by [REDACTED] in China begins with materials that Dynamics itself purchases on behalf of [REDACTED] CX-1202C at Q/A 145-147. These purchases were noted in this investigation’s order denying Dynamics’ motion for summary determination as well. Order No. 18 at 5. Mr. Weiner’s testimony explains why these materials should more than likely be considered foreign capital under section 337. CX-1200C at Q/A 13-15.⁸ Thus, as Mr. Thomas offers (CX-1202C at Q/A 157 (“Yes, one could add the cost of raw materials to my calculation in CX-0903C to estimate the total foreign card cost (labor plus raw materials), which can be compared to domestic labor investments.”)), material costs are included in the analysis as in the modified table below:

Subsection (B) – Labor or Capital (Foreign) *Modified*					
	2016	2017	2018	July 2019	Total
Dynamics’ Labor	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED] “Labor”	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<i>Material Costs (CX-1202C at Q/A 157)</i>	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Total (Dynamics + [REDACTED])	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

⁸ A related portion of Mr. Weiner’s testimony raises questions about whether Dynamics’ production-related expenses have been allocated correctly. He testifies that a large portion of the non-capital equipment expenses (itself a large portion of Dynamics’ claimed domestic plant and equipment totals) are “mostly [REDACTED] used in payment card production.” CX-1200C at Q/A 67-68. The extent to which these figures may include or overlap with materials purchased for Able’s consumption is unclear. As Samsung does not contest their legitimacy, there is really no basis to overturn the implication that they are properly domestic investment.

[REDACTED]

The addition of these raw material (*i.e.*, capital) costs nearly doubles' Dynamics foreign labor and capital amounts. Yet, there is no material change to the proportion of value added by Dynamics' domestic labor. As determined above, the domestic labor investments are \$ [REDACTED] for the 153 patent, \$ [REDACTED] for the 100 patent, and the same \$ [REDACTED] for the 631 patent. When each is added to the total foreign plant and equipment *estimate* of \$ [REDACTED], the resulting domestic as a percentage of total becomes 40.9%, 50.3%, and 50.3% for each patent, respectively. The one-half value added by the domestic labor for the 100 and 631 patents is certainly significant, as is the almost one-half value added for the 153 patent.

Accordingly, the balance of the evidence in this investigation supports finding economic prong domestic industry met under subsection (B) for the 153, 100, and 631 patents under Dynamics' allegations of technical prong.

Further, should the above determinations regarding technical prong domestic industry be accepted—*i.e.*, that no products have been shown to practice the 153, 100, or 631 patents save the CIBC card and the 100 patent—then economic prong is met only for the 100 patent. In this circumstance, the \$ [REDACTED] domestic labor and capital investment equates to around 24% of worldwide value add. This absolute amount and conservative percentage⁹ would not be considered insignificant or “modest.” *Carburetors*, Inv. No. 337-TA-1123, Comm’n Op. at 17, 24 (citing *Lelo*, 786 F.3d at 885).

⁹ This is conservative as it assumes all \$ [REDACTED] in foreign costs over 2016-July 2019 are for the CIBC card, when, in reality, a large amount was for the IndusInd. *See* CX-0800C at *3.

[REDACTED]

B. Domestic Industry in the Process of Being Established

As explained throughout this initial determination, the only domestic industry that can be supported by the Connected Wallet Card (a.k.a. Emirates NBD) is one that is “in the process of being established”; and the only patent which is alleged to have such an industry is the 545 patent. Also as determined, practice of the 545 patent, *i.e.*, technical prong, is “in the process of being established.” This leaves the question of whether significant domestic investment towards the 545 patent, *i.e.*, economic prong, is similarly “in the process of being established.”

Dynamics argues such an industry is being established for the Connected Wallet Card “through designing and developing prototypes that incorporate the cellular technology protected by the ’545 patent.” CIB at 139 (citing CX-1202C at Q/A 169; *Thermoplastic Motors*, Inv. No. 337-TA-1073, Comm’n Op. at 6). Dynamics continues, “[t]here is also a significant, if not certain, likelihood that Dynamics’ domestic industry in the Connected Wallet Card products will be satisfied in the future.” *Id.* (citing CX-1198C at Q/A 73; Hr’g Tr. at 36:21-25; 87:11-14). For support, Dynamics looks to the Connected Wallet Card agreements it has entered into, or explored, with financial institutions, both prior to (*e.g.*, CX-0046C) and after (*e.g.*, CX-0231C) the complaint (*see* CIB at 139-140). Dynamics also points to agreements and negotiations with mobile network providers, over the same time frame, to supply the cellular connectivity required by the 545 patent (*see id.* at 140 (citing CX-0121C; CX-0122C; CX-0124C; CX-0236C; CX-1197C at Q/A 54, 63, 65, 86)), as well as the general focus of its research and development team on getting the product “fully operational” (*id.* at 140-141 (citing, *inter alia*, CX-1200C at Q/A 112-113; CX-1198C at Q/A 84, 99-132; CX-1197C at Q/A 13, 79, 85-88; CX-0020C at *3-13)). Dynamics acknowledges much of the above effort is on-going, [REDACTED] of the product. *Id.* at 141-142 (citing, *inter alia*, CX-1198C at Q/A 99-132; CX-1197C

[REDACTED]

at Q/A 13, 82-88). Only briefly does Dynamics mention *where* the future work for the Connected Wallet Card will take place once commercialized; it expects domestic activity levels similar to the CIBC and IndusInd products. *See* CRB at 73-74 (citing CX-1201C at Q/A 20-49).

In opposition, Samsung contends the [REDACTED] development cycle behind the Connected Wallet Card, combined with a failure to practice the patent by the filing of the complaint, evidences no “significant likelihood that the industry requirement will be satisfied in the future.” *See* RIB at 142-144 (citing, *inter alia*, *Stringed Instruments*, Inv. No. 337-TA-586, Comm’n Op. at 13; CX-1202C at Q/A 165-166); RRB at 73 (citing RX-0215C at *4; RX-1678C at Q/A 35; RX-0148C; RX-0143C; RX-0040C at 34:12-17; RX-0042C at 259:23-260:5; Hr’g Tr. at 86:14-87:14). Samsung claims [REDACTED]

[REDACTED]

[REDACTED] (RIB at 143 (citing RX-0040C at 34:22-35:7, 211:1-16)) and [REDACTED] [REDACTED] (*id.* (citing CX-0072C; RX-0042C at 166:6-19, 167:8-20, 168:18-169:4)). Finally, Samsung argues “there is substantial uncertainty regarding whether future investment in the Connected Wallet Card will occur in the U.S.,” and cites foreign law over personalization activities and cellular network testing as examples of needed investment that will indisputably occur overseas. RIB at 144 (citing RX-0040C at 210:4-17; Hr’g Tr. at 115:25-116:4, 133:22-134:11; RX-0020C at 35:8-24, 115:9-14).

The Commission’s test for a domestic industry “in the process of being established” is “if the complainant can ‘demonstrate that it is taking the necessary tangible steps to establish such an industry in the United States’ and that there is a ‘significant likelihood that the industry requirement will be satisfied in the future.’” *Thermoplastic Motors*, Inv. No. 337-TA-1073, Comm’n Op. at 11 (citing *Stringed Instruments*, Inv. No. 337-TA-1073, Comm’n Op. at 13). Thus,

[REDACTED]

the test is not whether the complainant is taking steps to commercialize a product, and will likely have that commercialization in the future—but whether the complainant is taking steps towards making a domestic industry as defined by statute exist (19 U.S.C. § 1337(a)(2), (3)), and will likely succeed. Put another way, the test evaluates what is being done to effect “in the United States, relating to the articles protected by [the right concerned] . . . significant investment in plant and equipment[,], significant employment of labor or capital[, or] substantial investment in . . . exploitation, including engineering, research and development, or licensing.” *Id.*

Dynamics has not met its burden, in that it has not shown, or even argued, which subsection of Section 337 its future domestic industry will satisfy. *See, e.g., Certain Pouch-Type Battery Cells, Battery Modules, and Battery Packs, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-1179, Order No. 51 at 1 (Dec. 14, 2020) (“SK seems summary determination for an ‘industry in the process of being established under Section 337(a)(2), as reflected by its investment in plant and equipment pursuant to Section 337(a)(3)(A).’”), *affirmed in relevant part*, Notice at 2 (Jan. 14, 2021); *Non-Volatile Memory*, Inv. No. 337-TA-1046, Comm’n Op. at 40 (noting complainant pursued “in the process of being established” under subsections (A), (B), and (C))). Even if it is assumed subsections (A) and (B) are what is claimed, Dynamics’ briefing is unclear as to whether the recounted activities (*e.g.*, agreement negotiation, hardware redesign, etc.) are themselves the significant domestic activity (*see, e.g.*, CRB at 73 (“Dynamics has made significant efforts”)) or are what will lead to that activity by virtue of the product being out in the market (*see, e.g.*, CRB at 73 (discussing “future investment”)).

Instead of either option, Dynamics seems to assume that any commercialization of the Connected Wallet Card automatically means a domestic industry (*see* CIB at 139-142); it is only at the end of its rebuttal brief, and in response to Samsung’s argument, that Dynamics first

[REDACTED]

mentions where Connected Wallet Card activity will take place (*see* CRB at 73-74)—the most critical question. Yet even here, Dynamics only attacks Samsung’s doubts as “rank speculation” without citing any affirmative evidence of its own. *Id.* (citing RX-0020C at 25:4-24, 56:2-57:16 (witness having no knowledge of when Connected Wallet Card production will occur); CX-1201C at Q/A 20-49 (witness explaining no plans to move more CIBC or IndusInd production overseas, with no mention of Connected Wallet Card)). There is also no estimation, rough or otherwise, as to what the financial figures of that future domestic industry would be, nor explanation on why they would be “significant.” Altogether, Dynamics’ effort would not be sufficient for a complainant asserting a domestic industry “exists,” and is likewise not sufficient for showing one “in the process of being established.”

Accordingly, Dynamics has not shown economic prong domestic industry for the 545 patent.

IX. CONCLUSIONS OF LAW

1. The Commission has *in rem* jurisdiction over the Accused Products, multifunction emulators and products containing same.
2. The importation or sale requirement of Section 337 is satisfied for all respondents.
3. Dynamics has not been shown to practice any claims of U.S. Patent No. 8,827,153.
4. Dynamics has been shown to practice claim 1 of U.S. Patent No. 10,032,100, but not claims 6 or 8.
5. Dynamics has not been shown to practice any claims of U.S. Patent No. 10,223,631.
6. Dynamics has not been shown to practice any claims of U.S. Patent No. 10,255,545 but has shown practice is “in the process of being established.”
7. The domestic industry requirement is not satisfied with respect to the 153 patent.
8. The domestic industry requirement is satisfied with respect to the 100 patent.
9. The domestic industry requirement is not satisfied with respect to the 631 patent.
10. The domestic industry requirement is not satisfied with respect to the 545 patent.

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11. Samsung directly infringes claims 1 and 7 of the 153 patent.
 12. Samsung directly infringes claims 1, 12, and 18 of the 100 patent.
 13. Samsung directly infringes claims 1, 4, 6, and 22 of the 631 patent.
 14. Samsung directly infringes claims 1, 3, and 5 of the 545 patent.
 15. Claims 1 and 7 of the 153 patent have not been shown to be invalid under 35 U.S.C. § 103.
 16. Claims 1, 8, 12, and 18 of the 100 patent have been shown to be invalid under 35 U.S.C. § 102 due to anticipation, but not claim 4. Claims 1, 6, and 12 have been shown to be invalid under 35 U.S.C. § 103, but not claim 4. No claims of the 100 patent have been shown to be invalid under 35 U.S.C. §§ 102(f), 112, or 116.
 17. Claim 1 of the 631 patent has been shown to be invalid under 35 U.S.C. § 102 due to anticipation, but not claim 4. Claims 1, 4, 6, and 22 have been shown to be invalid under 35 U.S.C. § 103. No claims of the 631 patent have been shown to be invalid under 35 U.S.C. §§ 102(f), 112, or 116.
 18. Claims 1, 3, and 5 of the 545 patent have been shown to be invalid under 35 U.S.C. § 102 due to anticipation. No claims have been shown to be invalid under 35 U.S.C. 102(f) or 116.
 19. There is no violation of Section 337 with respect to the 153 patent.
 20. There is no violation of Section 337 with respect to the 100 patent.
 21. There is no violation of Section 337 with respect to the 631 patent.
 22. There is no violation of Section 337 with respect to the 545 patent.

X. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission's Rules provide that subsequent to an initial determination on the question of violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, the administrative law judge shall issue a recommended determination concerning the appropriate remedy in the event that the Commission finds a violation of section 337, and the amount of bond to be posted by respondent during Presidential review of the Commission action under section 337(j). *See* 19 C.F.R. § 210.42(a)(1)(ii).



The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986). Under Section 337(d)(1), if the Commission determines as a result of an investigation that there is a violation of section 337, the Commission is authorized to enter either a limited or a general exclusion order. 19 U.S.C. § 1337(d)(1). A limited exclusion order (“LEO”) instructs the U.S. Customs and Border Protection (“CBP”) to exclude from entry all articles that are covered by the patent at issue and that originate from a named respondent in the investigation. A general exclusion order instructs the CBP to exclude from entry all articles that are covered by the patent at issue, without regard to source. *Certain Purple Protective Gloves*, Inv. No. 337-TA-500, Comm’n Op. at 5 (Dec. 22, 2004). Under section 337(f)(1), the Commission may issue a cease and desist order (“CDO”) in addition to, or instead of, an exclusion order. 19 U.S.C. § 1337(f)(1). The Commission generally issues a cease and desist order directed to a domestic respondent when there is a “commercially significant” amount of infringing, imported product in the United States that could be sold, thereby undercutting the remedy provided by an exclusion order. *See Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, USITC Pub. 2391, Comm’n Op. on Remedy, the Public Interest and Bonding at 37-42 (June 1991); *Certain Condensers, Parts Thereof and Prods. Containing Same, Including Air Conditioners for Automobiles*, Inv. No. 337-TA-334 (Remand), Comm’n Op. at 26-28 (Sept. 10, 1997).

Additionally, during the 60-day period of Presidential review under 19 U.S.C. § 1337(j), “articles directed to be excluded from entry under subsection (d) . . . shall . . . be entitled to entry under bond prescribed by the Secretary in an amount determined by the Commission to be sufficient to protect the complainant from any injury.” *See* 19 U.S.C. § 1337(j)(3). “The Commission typically sets the bond based on the price differential between the imported infringing

[REDACTED]

product and the domestic industry article or based on a reasonable royalty. However, where the available pricing or royalty information is inadequate, the bond may be set at one hundred (100) percent of the entered value of the infringing product.” *Certain Industrial Automation Systems and Components Thereof Including Control Systems, Controllers, Visualization Hardware, Motion and Motor Control Systems, Networking Equipment, Safety Devices, and Power Supplies*, Inv. No. 337-TA-1074, Comm’n Op. at 13 (Apr. 23, 2019) (“*Automation Systems*”) (public version) (citation omitted).

A. Limited Exclusion Order

Should a violation be found, Dynamics argues the Commission “should issue LEOs covering each of Samsung respondents’ Accused Products,” to “exclude from entry into the United States the Samsung respondents’ Accused Products that infringe the asserted claims of the ’153, ’100, ’631, and ’545 patents.” CIB at 143. Dynamics denies the need for any sort of continuing reporting requirement from itself to the Commission during the period of exclusion on the status of its ongoing domestic industry. *See id.* Dynamics argues such reports are not proper when a complainant, such as itself, has “expended ‘substantial efforts . . . in establishing a domestic industry in articles that practice the’ asserted patents.” *Id.* (citing *Non-Volatile Memory*, Inv. No. 337-TA-1046, Comm’n Op. at 50-51). Dynamics contends there is no danger of it ceasing its domestic investments, it has no plans to reduce staff, it has had continuous increases in annual revenue, and it is otherwise close to commercial production of two additional products, the SMCC and Emirates NBD. *See id.* at 143-144 (citing, *inter alia*, CX-1197C at Q/A 13; CX-1200C at Q/A 80-81; CX-1201C at Q/A 27-30; Hr’g Tr. at 761:25-762:7; RX-0623C); CRB at 74. Thus, according to Dynamics, “there is no reason for the Commission to take the extraordinary step of burdening Dynamics with periodic reporting on the status of its domestic industry” when there is

[REDACTED]

an equal ability for Samsung to petition for modification or rescission of the LEO if Dynamics' condition changes. CIB at 144.

This is contrasted with Samsung's request for a repair and replacement exception to the LEO, where Dynamics impliedly argues in its initial brief that no supporting information was produced during the fact discovery period. *See id.* at 144-145 (citing [*Certain Audio Processing Hardware, Software, and Products Containing the Same*], Inv. No. 337-TA-1026, Order No. 58 at 6-7 [(Aug. 15, 2017)]; [*Certain Automated Teller Machines, ATM Products, Components Thereof, and Products Containing the Same*], Inv. No. 337-TA-972, Order No. 29 at 2 [(Aug. 24, 2016)]). In its reply brief, Dynamics specifies that the one document cited by Samsung on this topic indicates its liability for any previously sold product would be the purchase price, negating the need for repair or refund. CRB at 75 (citing RIB at 147; RX-1631 at *7; *Certain Magnetic Data Storage Tapes & Cartridges Containing the Same*, Inv. No. 337-TA-1076, Comm'n Op. at 61-62 (June 20, 2019)).

Samsung notes that the MST feature at issue in this investigation is just one among many payment options included within Samsung Pay; and that it has been de-emphasized and then discontinued by the most recent product offerings. *See* RIB at 146-17 (citing, RX-1676C at Q/A 22-25; RX-1359C; RX-1465C; RX-1474C). Samsung acknowledges that should a violation be found, an LEO should enter, but it should explicitly exempt the Hardware-Modified Products and Software-Modified Products and allow for warranty and maintenance commitments to Samsung's customers. *Id.* at 147 (citing, *inter alia*, RX-1631 at *6); RRB at 74-75.

Samsung also contends [REDACTED] that "Dynamics should be required to provide quarterly updates as to its financial state and immediately inform the Commission if it intends to cease its alleged domestic industry activities." RIB at 144 (citing

[REDACTED]

Certain Variable Speed Wind Turbines and Components Thereof, Inv. No. 337-TA-376, Comm’n Notice, 1996 WL 1056330, at *3-4 (Nov. 1996) (“*Wind Turbines*”). Samsung then refers to a variety of evidence allegedly demonstrating Dynamics’ [REDACTED] *See id.* at 145-146; RRB at 73-74 (citing RX-0155C at *4, 8; RX-0040C at 113:8-114:8, 18:12-19:5; Hr’g Tr. at 127:15-128:2).

Should the Commission find a violation, it is recommended that a limited exclusion order issue—an outcome the parties do not oppose. As for Samsung’s concerns over the Software-Modified Products and Hardware-Modified Products, it is recommended the Commission include a standard certification provision within the LEO. The Commission has instructed that “[c]ertification provisions aid U.S. Customs and Border Protection (‘CBP’) in enforcing Commission orders but ‘do not mandate that CBP accept certification as proof that the articles in question are not covered’ by the limited exclusion order.” *Certain Robotic Vacuum Cleaning Devices and Components Thereof Such as Spare Parts*, Inv. No. 337-TA-1057, Comm’n Op. at 55 (Feb. 1, 2019). Additionally, according to the Commission, “[t]he standard provision does not allow an importer to simply certify that it is not violating the exclusion order. Rather, CBP only accepts a certification that the goods have been previously determined by CBP or the Commission not to violate the exclusion order” and “it has been Commission practice for the past several years to include certification provisions in its exclusion orders to aid CBP.” *See Certain Road Milling Machines and Components Thereof*, Inv. No. 337-TA-1067, Comm’n Op. at 15, 15 n. 5 (Aug. 7, 2019) (citations omitted). Infringement by the Software-Modified Products and Hardware-Modified Products has been evaluated in this investigation and thus their importation will be permitted, if warranted, with the standard certification provision.

[REDACTED]

It is not recommended that Dynamics be subject to quarterly reporting requirements on the state of its domestic industry. The investigation Samsung references to support the requirement, *Wind Turbines*, involved distinguishable circumstances. The complainant there had already filed for bankruptcy before the Commission's decision and had indicated in a submission that "it may sell its manufacturing business as a going concern and that it is presently identifying third parties who may be interested in purchasing various aspects of its business and patented technology." See Inv. No. 337-TA-376, Comm'n Op., 1996 WL 1056330 at *13-14, 16. Indeed, the Commission observed that in a bankruptcy filing, the complainant "represented that it was – *formerly* in the business of manufacturing utility-scale wind powered electric power plants." *Id.* at *13-14 (emphasis in original). There is nothing in the record to suggest Dynamics is actively winding down its operations, and Samsung does not suggest this is happening. To the contrary, the record shows intensive efforts to commercialize the SMCC and Emirates NBD products are continuing, as is IndusInd production, [REDACTED]." See RX-0155C at *4, 8. As noted by Dynamics, the Commission has considered such efforts as weighing against reporting requirements. CIB at 143 (citing *Non-Volatile Memory*, Inv. No. 337-TA-1046, Comm'n Op. at 50-51 ("Given the substantial efforts and expenditure so far expended by Macronix in establishing a domestic industry in articles that practice the '602 patent, the Commission declines to include a reporting requirement as to the status of Macronix's domestic industry in the process of being developed."))).

As for a warranty and repair exception, this involves a consideration of the public interest. See e.g., *Certain Two-Way Radio Equipment and Systems, Related Software and Components Thereof*, Inv. No. 337-TA-1053, Comm'n Op. at 31-32 (Dec. 18, 2018). Public interest was not

[REDACTED]

delegated to the administrative law judge in this investigation. EDIS Doc. No. 685056. Accordingly, no recommendation is provided on this issue.

B. Cease and Desist Order

Should a violation be found, Dynamics argues CDOs should issue “against each of the Samsung respondents because they maintain commercially significant inventories of infringing products in the United States that are used to fulfill sales to their U.S. customers.” CIB at 145-146. Specifically, Dynamics cites Samsung’s website used to accept and facilitate orders of infringing goods in the United States (*id.* at 147 (citing CX-0767 at *3)) and Samsung’s inventory of [REDACTED] Accused Products in [REDACTED] domestic locations (*id.* (citing CX-0739C at *3-6; CX-1202C at Q/A 175; CX-0909C)).

In opposition, Samsung argues Dynamics has not met its burden on the issue (RIB at 148) and, regardless, no CDO should issue against Samsung Electronic Corporation “as SEC’s activities in foreign markets do not implicate the Asserted Patents” (*id.*). Samsung further seeks an exemption, as under any LEO, for “ongoing product support for MST functionality in devices imported before the end of the Presidential Review period.” *Id.*

Complainants bear the burden on the issue of cease and desist orders. *Certain Microfluidic Devices*, Inv. No. 337-TA-1068, Comm’n Op. at 23 (Jan. 10, 2020). Such orders “are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order.” *Id.* at 22-23 (citations omitted). The interrogatory response provided by Samsung and cited by Dynamics demonstrates [REDACTED] [REDACTED] are stored in the U.S., which constitutes a significant inventory. CX-0739C at *5-6. Further, given that Samsung Electronics America, Inc. is a subsidiary of Samsung

[REDACTED]

Electronics Co., Ltd., it is appropriate to issue CDOs to both respondents regardless of which actually controls the U.S. inventory. *See Certain Three-Dimensional Cinema Systems and Components Thereof*, Inv. No. 337-TA-939, Comm’n Op. at 63-64 (Aug. 23, 2016). Moreover, to the extent Samsung’s reference to SEC and foreign markets involves exportation of this inventory, that activity would not be prohibited under a CDO. *See Non-Volatile Memory*, Inv. No. 337-TA-1046, Comm’n Op. at 53 (“CDOs do not preclude exportation of covered products so Toshiba’s concerns as to its exportation of infringing goods are unfounded.”).

Accordingly, it is recommended that cease and desist orders issue against each Samsung respondent.

C. Bond

The Commission has held that “[t]he complainant bears the burden of establishing the need for a bond” during the Presidential Review period. *See Robotic Vacuums*, Inv. No. 337-TA-1057, Comm’n Op. at 68. In this investigation, Dynamics argues the typical price-differential approach for calculating a bond is inappropriate here “because Samsung’s infringing products include a variety of products, pricing variations, and distribution methods compared to Dynamics’ domestic industry products.” CIB at 149. Dynamics argues royalty rates as provided in the only license it has entered into for the Asserted Patents should also not be considered because: (1) “[licensee LG] [REDACTED] (id. at 149 (citing CX-0284)); and (2) the [REDACTED] [REDACTED] (id. at 149-150 (citing CX-0054C; CX-1202C at Q/A 180, 182)). Thus, reasons Dynamics, “a 100% bond is necessary to protect Dynamics from injury during the Presidential review period due to the loss of revenues or royalties that would otherwise

[REDACTED]

accrue if the Samsung respondents were licensed to the asserted patents.” *Id.* at 150 (citing *Cinema Systems*, Inv. No. 337-TA-939, Comm’n Op. at 68).

In opposition, Samsung argues the bond should be set to zero because there would be no competitive advantage resulting from a violation: “Dynamics does not manufacture or sell products competing with the Accused Products, and it has not alleged the ‘injury’ it will suffer.” RIB at 148-149 (citing *Certain Coenzyme Q10 Products and Methods of Making Same*, Inv. No. 337-TA-790, Initial Determination, 2012 WL 5383646, at *175-177 (Sept. 27, 2012)). Samsung continues, as an alternative, that Dynamics’ LG license is comparable based on the licensed product and [REDACTED] and per-unit royalty rate terms. *Id.* (citing RX-0159C at *1-5). The agreement, reasons Samsung, supports, at most, a bond of [REDACTED] per unit. *See id.* at 149-150. In reply, Samsung refers to Dynamics’ statement on “‘loss of revenues of royalties that would otherwise accrue if the Samsung respondents were licensed to the asserted patents’” to further justify its proposed bond based on a reasonable royalty. RRB at 75 (citing CIB at 150).

Dynamics has not shown the need for a bond in the event of a violation. While the Commission has made clear that a 100% bond is appropriate when a price differential is not practical or not possible given the record, the overall focus is to protect the complainant from injury. *Non-Volatile Memory*, Inv. No. 337-TA-1046, Comm’n Op. at 67 (citing 19 C.F.R. § 210.50(a)(3)). When, as is the case here, no domestic industry product is even available for purchase in the United States (Hr’g Tr. at 34:2-9 (discussing CIBC in Canada, IndusInd in India)), a price differential is not simply impractical but impossible. Correspondingly, the injury described by Dynamics (CIB at 150 (“loss of revenues or royalties that would otherwise accrue if the Samsung respondents were licensed to the asserted patents”)) pertains only to royalty revenue from

Samsung, as opposed to third parties. That allegedly lost royalty would presumably not arise, even if Samsung was licensed, from products not imported by Samsung during the Presidential review period. As Dynamics actively argues against a bond based on reasonable royalty or anything less than 100% (see CIB at 149-150), no bond is warranted. *Certain Digital Video Receivers and Related Hardware and Software Components*, Inv. No. 337-TA-1103, Comm’n Op. at 32 (May 13, 2020) (“The Commission agrees with the RD’s conclusion that Rovi failed to justify the need for a bond, including that Rovi did not establish an appropriate price differential in view of the absence of reliable pricing information . . . or royalty rate, where Rovi failed to show the role of these patents in the portfolio patent licenses . . .”).

Accordingly, it is recommended that no bond requirement should issue.

XI. INITIAL DETERMINATION AND ORDER

Based on the foregoing,¹⁰ it is my Initial Determination that there is no violation of Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain mobile devices with multifunction emulators, in connection with the asserted claims of U.S. Patent Nos. 8,827,153, 10,032,100, 10,223,631, and 10,255,545.

Furthermore, it is my determination that a domestic industry in the United States exists that practices or exploits U.S. Patent No. 10,032,100, but no others.

I certify to the Commission this Initial Determination, together with the Record of the hearing in this investigation consisting of the following: the transcript of the evidentiary hearing, with appropriate corrections as may hereafter be ordered; and the exhibits accepted into evidence in this investigation.¹¹

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission sixty (60) days after the date of service of the Initial Determination, unless a party files a petition for review of the Initial Determination within twelve (12) business days after service of the Initial Determination pursuant to 19 C.F.R. § 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion, a review of the Initial Determination or certain issues therein. Any issue or argument not raised in a petition for review,

¹⁰ The failure to discuss any matter raised by the parties or any portion of the Record herein does not indicate that said matter was not considered. Rather, any such matter(s) or portion(s) of the Record has/have been determined to be irrelevant, immaterial or meritless. Arguments made on brief which were otherwise unsupported by Record evidence or legal precedent have been accorded no weight.

¹¹ The pleadings of the parties filed with the Secretary need not be certified as they are already in the Commission's possession in accordance with Commission rules.

[REDACTED]

or response thereto, will be deemed to have been abandoned and may be disregarded by the Commission in reviewing the Initial Determination pursuant to 19 C.F.R. § 210.43(b) and (c).

[REDACTED]

Confidentiality Notice:

This Initial Determination is being issued as confidential, and a public version will be issued pursuant to Commission Rule 210.5(f). Within seven (7) days of the date of this Initial Determination, the parties shall jointly submit: (1) a proposed public version of this opinion with any proposed redactions bracketed in red; and (2) a written justification for any proposed redactions specifically explaining why the piece of information sought to be redacted is confidential and why disclosure of the information would be likely to cause substantial harm or likely to have the effect of impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions.¹²

SO ORDERED.



Cameron Elliot
Administrative Law Judge

¹² Under Commission Rules 210.5 and 201.6(a), confidential business information includes: information which concerns or relates to the trade secrets, processes, operations, style of works, or apparatus, or to the production, sales, shipments, purchases, transfers, identification of customers, inventories, or amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or other organization, or other information of commercial value, the disclosure of which is likely to have the effect of either impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions, or causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained, unless the Commission is required by law to disclose such information. *See* 19 C.F.R. § 201.6(a). Thus, to constitute confidential business information the disclosure of the information sought to be designated confidential must likely have the effect of either: (1) impairing the Commission's ability to obtain such information as is necessary to perform its statutory functions; or (2) causing substantial harm to the competitive position of the person, firm, partnership, corporation, or other organization from which the information was obtained.

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** has been served upon the following parties as indicated, on **April 1, 2021**.



Lisa R. Barton, Secretary
U.S. International Trade Commission
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Washington, DC 20436

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN MOBILE DEVICES WITH
MULTIFUNCTION EMULATORS**

Inv. No. 337-TA-1170

ORDER NO. 7: CONSTRUING TERMS OF THE ASSERTED CLAIMS

(January 31, 2020)

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	RELEVANT LAW	1
III.	LEVEL OF ORDINARY SKILL	6
IV.	THE ASSERTED PATENTS	7
	A. Technical Background	8
	B. The Asserted Claims	10
V.	CLAIM CONSTRUCTION	17
	A. Construction of the Agreed-Upon Claim Terms	17
	B. Construction of the Disputed Claim Terms	18
	1. '153 Patent - "at least one track of magnetic stripe data"	18
	2. '153 Patent - "digital representation of said at least one track of magnetic stripe data"	20
	3. '153 Patent - "magnetic stripe emulator"	21
	4. '631 Patent - "dynamic magnetic stripe communication device"	23
	5. '631 Patent - "serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal"	25
	6. '631 Patent - "operable to electrically couple to a payment terminal . . . and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal"	28
	7. '631 Patent - "within proximity of"	31
	8. '631 Patent - "virtual payment card"	33
	9. '545 Patent - "operable to electrically couple [the device] to a payment terminal and to communicate [data in magnetic stripe data format/magnetic stripe data] to the payment terminal"	34
	10. '545 Patent - "within proximity of"	35
	11. '545 Patent - "virtual payment card"	36

12.	`100 Patent – “operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader”	36
13.	`100 Patent – “virtual card”	37

I. INTRODUCTION

This investigation was instituted by the Commission on August 16, 2019 to determine whether certain mobile devices with multifunction emulators infringe U.S. Patent Nos. 8,827,153 (“the ‘153 patent”), 10,032,100 (“the ‘100 patent”), 10,223,631 (“the ‘631 patent”), and 10,255,545 (“the ‘545 patent”) (altogether, “the Asserted Patents”). *See* 84 Fed. Reg. 42010 (Aug. 16, 2019). The complainant is Dynamics Inc. (“Dynamics” or “Complainant”). The Respondents are Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (together, “Samsung” or “Respondents”) (all collectively, “the Parties”).

Pursuant to Ground Rule 6, a *Markman* hearing was held November 26, 2019, regarding the interpretation of certain terms of the patent at issue. Prior to the hearing, the Parties filed a joint claim construction chart setting forth a limited set of terms to be construed, and filed an updated joint chart after the hearing. EDIS Doc. ID 696761. Dynamics and Samsung filed initial and rebuttal claim construction briefs,¹ wherein each party offered its construction for the claim terms in dispute, along with support for its proposed interpretation. Further, per my request, the Parties prepared and filed a joint tutorial on the technology at issue. EDIS Doc. ID 696757.

II. RELEVANT LAW

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly

¹ The briefs and amended chart submitted by the Parties are referred to hereafter as:

CIMB	Complainant’s Initial <i>Markman</i> Brief
CRMB	Complainant’s Rebuttal <i>Markman</i> Brief
RIMB	Respondents’ Initial <i>Markman</i> Brief
RRMB	Respondents’ Rebuttal <i>Markman</i> Brief
JC	Updated Joint Claim Construction Chart
Hr’g Tr.	<i>Markman</i> hearing transcript
Joint Tutorial	Joint Technology Tutorial

construed claims to the device accused of infringing.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*) (internal citations omitted), *aff’d*, 517 U.S. 370 (1996). Claim construction is a “matter of law exclusively for the court.” *Id.* at 970-71. “The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.” *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the Specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (*en banc*); *see also Markman*, 52 F.3d at 979. As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in the art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Id.* at 1314; *see also Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”). The context in which a term is used in an asserted claim can be “highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, other

claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.* “Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.” *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999).

The specification “is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316. “In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Id.* As a general rule, however, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Id.* at 1323. In the end, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be ... the correct construction.” *Id.* at 1316 (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips* at 1317; see *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”).

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries,

inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* “The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

If, after a review of the intrinsic and extrinsic evidence, a claim term remains ambiguous, the claim should be construed so as to maintain its validity. *Phillips*, 415 F.3d at 1327. Claims, however, cannot be judicially rewritten in order to fulfill the axiom of preserving their validity. *See Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999). Thus, “if the only claim construction that is consistent with the claim’s language and the written description renders the claim invalid, then the axiom does not apply and the claim is simply invalid.” *Id.*

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention”; or (2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see also GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches

and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); see *Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted). As the Federal Circuit has explained, “[w]e do not read limitations from the specification into claims; we do not redefine words. Only the patentee can do that.” *Thorner*, 669 F.3d at 1366.

A claim must also be definite. Pursuant to 35 U.S.C. § 112, second paragraph: “The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 2. In *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014), the Supreme Court held that § 112, ¶ 2 requires “that a patent’s claims, viewed in light of the specification and prosecution history inform those skilled in the art about the scope of the invention with reasonable certainty.” A claim is required to “provide objective boundaries for those of skill in the art,” and a claim term is indefinite if it “might mean several different things and no informed and confident choice is among the contending definitions.” *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014). A patent claim that is indefinite is invalid. 35 U.S.C. § 282(b)(3)(A).

Courts are not required to construe every claim limitation of an asserted patent. See *O2 Micro Intern. Ltd. v. Beyond Innovation Technology Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008)

(citations omitted); *Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n*, 366 F.3d 1311, 1323 (Fed. Cir. 2004) (noting that the administrative law judge need only construe disputed claim terms). Rather, “claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims.” *Id.* at 1362 (quoting *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997)); *see also Embrex*, 216 F.3d at 1347 (“The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.”) (citation omitted).

In addition, “[a] determination that a claim term ‘needs no construction’ or has the ‘plain and ordinary meaning’ may be inadequate when a term has more than one ‘ordinary’ meaning or when reliance on a term’s ‘ordinary’ meaning does not resolve the parties’ dispute.” *O2 Micro*, 521 F.3d at 1361. Claim construction, however, is not an “obligatory exercise in redundancy.” *U.S. Surgical Corp.*, 103 F.3d at 1568. “[M]erely rephrasing or paraphrasing the plain language of a claim by substituting synonyms does not represent genuine claim construction.” *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 863 (Fed. Cir. 2004).

III. LEVEL OF ORDINARY SKILL

Dynamics’s opening brief contends “a person of ordinary skill in the art would have at least an undergraduate degree in computer science or electrical engineering and at least two years of experience with point of sale systems and financial transactions.” CIMB at 10 (citing CIMB, Ex. 5 at ¶ 23). Samsung’s opening brief offers no description of the person of ordinary skill in this art, (*see generally* RIMB), although Samsung claims in its rebuttal brief that it “timely disclosed” its position on this topic in its invalidity contentions (RRMB at 6 (citing RRMB, Ex. 27)). That description reads: “would have had at least a Bachelor’s degree in Electrical Engineering, or an equivalent technical degree or equivalent work experience, and knowledge regarding the use of

magnetic fields to transmit or otherwise convey information. Superior education would compensate for a deficiency in experience, and vice-versa.” RRMB at 6. Samsung takes the position the difference in the Parties’ definitions makes no difference to the outcome of the claim terms in dispute. *Id.*

I agree the proposed levels of skill are not dispositive; further, they are substantially similar. Samsung’s proposal, however, suffers from a failure to identify an amount or duration of experience. I am also skeptical that two years of experience following an undergraduate degree, as in Dynamics’s proposal, is enough, and whether it is necessary for such a person to have financial transaction experience in addition to their engineering background. And that engineering background must include some experience with transmitting information using magnetic fields, a topic conspicuously absent from the patents’ disclosures. Overall, a combination of the proposals is appropriate, with some modifications. Specifically, a person having ordinary skill in the art at the time of the inventions would have: an undergraduate degree in computer science, electrical engineering, or the equivalent (including computer engineering) and at least three years of experience with point of sale systems and the use of magnetic fields to convey information.

IV. THE ASSERTED PATENTS

The ‘153 patent, entitled “Systems and Methods for Waveform Generation for Dynamic Magnetic Stripe Communication Devices,” was issued on September 9, 2014 to Randy Rhoades and David Hartwick. The ‘153 patent reports an assignment on its face to Dynamics Inc.

The ‘100 patent, entitled “Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same,” was issued on July 24, 2018 to Jeffrey Mullen, David Lambeth, and Bruce Cloutier. The ‘100 patent reports an assignment on its face to Dynamics Inc.

The '631 patent, entitled "Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same," was issued on March 5, 2019 to Jeffrey Mullen, David Lambeth, and Bruce Cloutier. The '631 patent reports an assignment on its face to Dynamics Inc.

The '545 patent, entitled "Cards and Devices with Multifunction Magnetic Emulators and Methods for Using Same," was issued on April 9, 2019 to Jeffrey Mullen, David Lambeth, and Bruce Cloutier. The '545 patent reports an assignment on its face to Dynamics Inc.

A. Technical Background

The Asserted Patents all relate to devices used for making payments with point-of-sale systems in lieu of traditional magnetic stripe-bearing payment cards (*e.g.*, debit or credit cards). In order to accomplish the transaction, the devices create magnetic waveforms that are then received by the same magnetic stripe reader which would have interacted with the traditional payment card. *See, e.g.*, '153 patent at 1:23-37. In this way, it is an objective of the inventions that the magnetic waveform created by the devices be readable or understandable by the magnetic stripe reader in the same way that the magnetic stripe data of the traditional card would have been. Due to this functionality, the inventions include what is referred to as a magnetic encoder or magnetic stripe emulator. *See, e.g.*, '153 patent at 1:22-37.

By way of background, the purpose of the magnetic stripe on the back of traditional payment cards is to carry and communicate data to a magnetic card reader. Joint Tutorial at 2. The stripe and its data are subject to various standards set by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). *Id.*; RIMB at 2. One such standard requires that the data be encoded in the magnetic stripe on the payment card in a format known as frequency/double frequency (F2F) encoding. Joint Tutorial at 4. Another part of the standard requires that the data be organized into "tracks" and, more specifically, between one to three tracks,

referred to as Track 1, Track 2, and Track 3. *Id.* at 5. The tracks stretch across the full width of the payment card as shown below, and are comprised of different character-types at different densities:

Magnetic Stripe Encoding - Financial Transaction Cards

0.223" ↑ ↓	Track		Recording Density (bits per inch)	Character Configuration (including parity bit)	Information Content (including control characters)
0.110"	1	IATA	210	7 bits per character	79 alphanumeric characters
0.110"	2	ABA	75	5 bits per character	40 numeric characters
0.110"	3	THRIFT	210	5 bits per character	107 numeric characters

Joint Tutorial at 5; RIMB at 2. The arrangement of the data within each track is also standardized, with known starting and stopping characters, or “sentinels,” and field separators. *See* Joint Tutorial at 6-8; RIMB at 3. In traditional point-of-sale systems, the data contained in each track (*i.e.*, contained in the magnetic stripe) is read by swiping or sliding the stripe against a fixed magnetic read head in a magnetic card reader. In this way, the read head reads each bit of data as it moves by. RIMB at 6.

In order to communicate this same information to the same type of read head, the inventions of the asserted patents create magnetic fields similar to those created by the magnetic stripe of the traditional payment card. *See* `153 patent at 1:22-37. The `153 patent, for example, describes creating such fields by passing electrical current through an inductor (*e.g.*, a coil). *Id.* at 2:14-22. Aspects of the produced field, such as its magnitude or direction, may be varied by altering the direction or strength of the current passing through the coil. *Id.* at 2:14-22, 2:66-3:11; Joint Tutorial at 9.

B. The Asserted Claims

The '153 patent has 20 claims. As of the date of this order, claims 1 and 5-8 are asserted in this investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms in italics and the first instance of the disputed terms highlighted in bold):

1. A device comprising:

a **magnetic stripe emulator** operable to communicate an analog waveform encoded with **at least one track of magnetic stripe data** to a magnetic stripe reader; and

a waveform generator operable to generate said analog waveform from a **digital representation of said at least one track of magnetic stripe data**,

wherein said device is operable to retrieve said digital representation from a plurality of digital representations of said at least one track of magnetic stripe data.

....

5. The device of claim 1, further comprising a button, wherein **said digital representation** is retrieved from a memory of said device based on a signal from said button.

6. The device of claim 1, further comprising a button, wherein **said digital representation** is retrieved from a memory of said device based on a signal from said button, said digital representation associated with a payment account number.

7. The device of claim 1, wherein said analog waveform is encoded with two tracks of magnetic stripe data.

8. The device of claim 1, wherein said analog waveform is encoded with three tracks of magnetic stripe data.

The '100 patent has 20 claims. As of the date of this order, claims 1-20 are asserted in this investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms in italics and the first instance of the disputed terms highlighted in bold):

1. A device comprising:

a circuit **operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader**; and

a processor for controlling the circuit,

wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader at a distance of at least a quarter of an inch from the read-head.

2. The device of claim 1, wherein the device is thicker than a payment card.

3. The device of claim 1, wherein the device is a wireless communication device.

4. The device of claim 1, wherein the device is a portable telephonic device.

5. The device of claim 1, wherein the device is a portable media player.

6. The device of claim 1, further comprising a display operable to display a **virtual card**.

7. The device of claim 1, further comprising a touch-sensitive display operable to display a **virtual card**.

8. The device of claim 1, wherein the circuit is operable to emit a second electromagnetic field.

9. The device of claim 1, wherein the circuit is operable to emit a second electromagnetic field in parallel with the electromagnetic field.

10. The device of claim 1, wherein the circuit is operable to serially transmit the data.

11. The device of claim 1, wherein the circuit is operable to transmit the data in a parallel operation.

12. A portable telephonic device comprising:

a circuit **operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader;** and

a processor for controlling the circuit, wherein the circuit is operable to communicate the data to the read-head while located outside of the magnetic stripe reader.

13. The portable telephonic device of claim 12, further comprising a graphical user interface.

14. The portable telephonic device of claim 12, wherein the circuit is operable to communicate the data to the read-head located at a distance of at least a quarter of an inch from the portable telephonic device.

15. The portable telephonic device of claim 12, wherein the portable telephonic device is a portable media player.

16. The portable telephonic device of claim 12, further comprising a display operable to display a **virtual card**.

17. The portable telephonic device of claim 12, further comprising a touch-sensitive display operable to display a **virtual card**.

18. The portable telephonic device of claim 12, further comprising a second circuit operable to emit a second electromagnetic field.

19. The portable telephonic device of claim 12, further comprising a second circuit operable to emit a second electromagnetic field in parallel with the electromagnetic field.

20. The portable telephonic device of claim 12, wherein the circuit is operable to serially transmit the data.

The '631 patent has 22 claims. As of the date of this order, claims 1-7, 9-13, 19, 21, and 22 are asserted in this investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms in italics and the first instance of the disputed terms highlighted in bold):

1. An apparatus comprising:

a structure for receiving manual input;

a **dynamic magnetic stripe communication device**; and

a processor for controlling the dynamic magnetic stripe communication device,

wherein the dynamic magnetic stripe communication device is **operable to electrically couple to a payment terminal** when the dynamic magnetic stripe communication device is located outside and **within proximity of** the payment terminal and **to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal.**

2. The apparatus of claim 1, wherein the apparatus is thicker than a payment card.

3. The apparatus of claim 1, wherein the apparatus is a wireless communication device.
4. The apparatus of claim 1, wherein the apparatus is a portable telephonic device.
5. The apparatus of claim 1, wherein the apparatus is a portable media player.
6. The apparatus of claim 1, further comprising a display operable to display a **virtual payment card**.
7. The apparatus of claim 1, further comprising a touch-sensitive display operable to display a **virtual payment card**.

....

9. The apparatus of claim 1, wherein the processor is operable to:
 - determine presence of a read-head of a magnetic stripe reader based on received information; and
 - drive the **dynamic magnetic stripe communication device** to couple with the magnetic stripe reader.
10. The apparatus of claim 1, wherein the processor is operable to determine the presence of an RFID receiver based on received information.
11. The apparatus of claim 1, wherein the processor is operable to:
 - determine presence of a read-head of an RFID receiver based on received information; and
 - drive the **dynamic magnetic stripe communication device** to couple with the RFID receiver.

12. The apparatus of claim 1, wherein the serial communication occurs as a result of receiving the manual input.

13. The apparatus of claim 1, wherein the first magnetic stripe track data and the second magnetic stripe track data are the same track data.

....

19. The apparatus of claim 1, wherein the **dynamic magnetic stripe communication device** further serially communicates third magnetic stripe track data.

....

21. The apparatus of claim 1, wherein at least one of the first magnetic stripe track data and the second magnetic stripe track data comprises dynamic codes.

22. The apparatus of claim 1, wherein temporal pauses occur between the serial communications of the first magnetic stripe track data and the second magnetic stripe track data.

The '545 patent has 16 claims. As of the date of this order, claims 1-16 are asserted in this investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms in italics and the first instance of the disputed terms highlighted in bold):

1. A device comprising:

circuitry operable to communicate with a cellular network;

RFID circuitry operable to electrically couple the device to a payment terminal and to communicate RFID data to the payment terminal;

a coil; and

a processor for controlling the operation of the coil such that the coil is **operable to electrically couple the device to the payment terminal and to communicate data in magnetic stripe data format to the payment terminal,**

wherein the coil is operable to electrically couple the device to the payment terminal from a position beneath a surface of the device.

2. The device of claim 1, wherein the device is thicker than a payment card.
3. The device of claim 1, wherein the device is a portable telephonic device.
4. The device of claim 1, wherein the device is a portable media player.
5. The device of claim 1, further comprising a display operable to display a **virtual payment card.**
6. The device of claim 1, further comprising a touch-sensitive display operable to display a **virtual payment card.**
7. The device of claim 1, wherein the RFID circuitry comprises an RFID antenna.
8. The device of claim 1, wherein the RFID circuitry is further operable to electrically couple the device to the payment terminal when the device is outside and **within proximity of** the payment terminal.
9. A device comprising:
 - circuitry for cellular communications;
 - an RFID operable to electrically couple to a payment terminal and
 - to communicate RFID data to the payment terminal; and

a processor for controlling a coil **operable to electrically couple to the payment terminal and to communicate magnetic stripe data to the payment terminal,**

wherein the coil is operable to electrically couple the device to the payment terminal from a position beneath a surface of the device.

10. The device of claim 9, wherein the device is thicker than a payment card.

11. The device of claim 9, wherein the device is a portable telephonic device.

12. The device of claim 9, wherein the device is a portable media player.

13. The device of claim 9, further comprising:

a display operable to display a **virtual payment card.**

14. The device of claim 9, further comprising:

a touch-sensitive display operable to display a **virtual payment card.**

15. The device of claim 9, wherein the RFID comprises an RFID antenna.

16. The device of claim 9, wherein the RFID is further operable to electrically couple to the payment terminal when the device is outside and **within proximity of** the payment terminal.

V. CLAIM CONSTRUCTION

A. Construction of the Agreed-Upon Claim Terms

Prior to and after the *Markman* hearing, the parties reached agreement regarding the construction of the following terms in the asserted claims:

Claim Term	Present in Asserted Claims	Agreed Construction
“wherein device is operable to retrieve said digital representation”	`153 patent at claim 1	“wherein said device is operable to read said digital representation from memory”
“plurality”	`153 patent at claim 1	“more than one”

(JC at 2.)

These constructions are consistent with the intrinsic evidence and are therefore adopted.

See `153 patent at 5:55-56, 5:65-66.

B. Construction of the Disputed Claim Terms

The disputed claim terms are summarized in the Parties’ Updated Joint Claim Construction Chart. See JC. They are discussed individually below.

1. `153 Patent - “at least one track of magnetic stripe data”

Relevant Claims	Dynamics’ Construction	Samsung’s construction
1, 7, 8	Proposed construction: “data corresponding to at least one of the standard tracks of data associated with a payment card magnetic stripe, said data corresponding to a particular payment account” Supporting evidence: `153 Patent at 1:47-48, 2:23-33, 4:18-31, 5:46-50, 5:61-64, 13:63-14:9, Claim 1 Samsung Ex. 1 at 1-2 Samsung Ex. 4 at 4 Zatkovich Dec. at ¶¶27, 35, 36	Proposed construction: “at least one track of data in magnetic stripe format for a particular payment card or account” Supporting evidence: `153 Patent at 2:18-22, 2:23-25, 5:55-6:3, 8:40-46, 8:65-9:1, 10:32-48, 14:6-8, 14:49- 56 Ex. 1 (MagTek) at 1-2; Ex. 4 (ISO/IEC 7813) at 3-4; Ex. 5 (ISO/IEC 4909) at 1); Ex. 21 (Prosecution History, 8/29/2013 Amendment) at 2; Ex. 29 (Prosecution History, Originally Filed Claims), Claim 1; Ex. 30 (Prosecution History, 10/22/2012 Non-Final Rejection) at 2 Lipoff Decl., ¶¶ 37-40

(JC at 3.)

Complainant submits that this term is “easily understood by a person of ordinary skill in the art . . . [, that] payment card magnetic stripes generally include up to three tracks of data, and that at least some of those tracks must contain standard information in order to successfully process purchase transactions.” CIMB at 13. Complainant states that this term is not related to the actual data that is in the track, but instead is related to the format used for payment data. CRMB at 7-8. As was discussed during the joint tutorial, each track has a specific arrangement and type of data. Joint Tutorial at 5. Therefore, Complainant argues, the tracks have specific arrangements and types of data. CRMB at 7-8.

Respondents argue that this term relates to the actual payment data from a particular card, and not the track format. RRMB at 22. Respondents submit that the claim language requires that the term be actual data because “[i]n order to encode a signal, actual data is required.” RIMB at 40. Respondents further submit that the ‘153 specification teaches that the track contains actual data because it describes, *inter alia*, that “a waveform representative of a single **track** of magnetic stripe **information** may be communicated to a read-head of a magnetic stripe reader.” RIMB at 41 (citing ‘153 patent at 5:57-60) (emphasis in original). Thus, according to Respondents, the specification describes communicating actual information, and the quantity of information that will be communicated. *Id.* Finally, Respondents argue that the prosecution history illustrates that the patentee amended the claims to limit this term to be actual payment data. RRMB at 21.

I defer construction on this term, primarily because I am not persuaded that either Complainant or Respondents have proposed correct constructions. For instance, as Complainant noted at the hearing, and as is reflected in the Updated Joint Proposed Claim Construction Chart, “we’re in agreement that [the magnetic stripe data] has to be the same particular account.” Hr’g Tr. at 22; JC at 3. Although it is laudable that the parties have narrowed their differences, the term “account” appears nowhere in claim 1, and dependent claim 6 refers only to an “account number,”

and not to a payment account. So it is not clear that the disputed claim term should be construed with reference to payment accounts at all.

As another example, during the hearing I suggested that claim 1 would not be operable unless actual data was communicated; in response, Complainants emphasized that the minimum required data is the account number, and everything else is changeable. Hr'g Tr. at 32, 34. But it is not clear that claim 1 needs to be operable "to complete a purchase transaction," in contrast to claim 16, which does possess that limitation. Admittedly, the '153 patent is directed to payment transactions, but the term "payment" does not even appear in claim 1. So that claim may be operable merely by communicating, say, test data, or data otherwise encoded in magnetic stripe format but not used for payment purposes.

In any event, the parties' proposed constructions, which limit claim 1 to payment accounts and/or cards, may both be too narrow. Therefore, I decline to construe this term at present.

2. '153 Patent - "digital representation of said at least one track of magnetic stripe data"

Relevant Claims	Dynamics' Construction	Samsung's construction
1, 5, 6	Proposed construction: "digital information that represents said at least one track of magnetic stripe data" Supporting evidence: '153 Patent at 2:23-25, 2:34-57, 13:35-39, Claims 1, 5, and 6 Zatkovich Dec. at ¶43	Proposed construction: "a digital waveform that represents said at least one track of magnetic stripe data" Supporting evidence: '153 Patent at 2:23-25, 2:34-60, 4:5-6, 4:18-24, 4:27-31, 5:55-57, 5:64-67, 6:27-33, 6:36-39, 8:28-33, 8:49-55, 10:44-48, Fig. 2 Lipoff Decl., ¶¶ 41-43

(JC at 3.)

The dispute between the parties appears to be the term "representation." Complainant submits that representation means "information" and Respondent submits that it means "waveform."

Complainant states that the specification references both digital representations and digital waveforms, but does not indicate that a digital representation is limited to only a digital waveform. CIMB at 10. Respondents, on the other hand, argue that the specification “only describes generating analog waveforms from digital waveforms, not from generic digital representations.” RIMB at 46. Respondents further argue that the specification also “clearly, repeatedly, and consistently describes the information that is stored in the memories of the claimed devices as digital waveforms,” and this “amounts to the disavowal of broader possible embodiments.” RIMB at 47 (citing *SkinMedica, Inc. v. Histogen Inc.* 727 F.3d 1187, 1203 (Fed. Cir. 2013)).

Respondents are mistaken. According to the specification, the “representation of a waveform” stored in memory may be “digital.” See ’153 patent at 2:23-24, 2:41-42, claims 1, 2, 3, 5, 6. There is no evidence of disavowal or clear lexicography to limit any such “representation” to only a “waveform,” analog or digital. Absent “clear and unmistakable language” otherwise, Respondents’ suggested limitation does not meet the “exacting” standard to so limit the claim. *Cont’l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 798 (Fed. Cir. 2019). Accordingly, the term “digital representation of said at least one track of magnetic stripe data” is properly construed as “digital information that represents said at least one track of magnetic stripe data.”

3. ’153 Patent - “magnetic stripe emulator”

Relevant Claims	Dynamics’ Construction	Samsung’s construction
1	Proposed construction: Plain and ordinary meaning Supporting evidence: ’153 Patent at 1:22-37, 2:14-22, 14:19-35, col. 15-16, Figs. 1 and 7, Claim 1 Zatkovich Dec. at ¶¶26-28	Proposed construction: “an emulator in a magnetic stripe form that can communicate magnetic information” Supporting evidence: ’153 Patent at 1:28-30, 2:14-16, 2:66-3:11, 3:27-40, 6:9-16, 6:39-43, 9:36-51, 10:1-4, 13:13-25, Fig. 1, Claim 3, Claim 4 Ex. 16 (Poidomani) at [0065], Fig. 2

(JC at 2.)

Complainant submits that this term defines a “device that emulates a magnetic stripe.” CIB at 11. Respondents, on the other hand, submit that the term should be construed “consistent with the specification and the term’s use in the prior art² as an emulator in a magnetic stripe form.” RIB at 37. According to Respondents, the specification does not use the term magnetic stripe emulator, and because the ’153 patent does not suggest any ability to communicate magnetic stripe data from outside a magnetic reader, the claim term magnetic stripe emulator must be limited to an emulator in stripe form. RIB at 39.

The specification is admittedly vague on the technical details of the emulator; for instance, it does not teach a particular structure for the magnetic emulator beyond the use of an induction coil, and it does not teach a particular manner of communicating the data beyond “fluctuat[ing] the amount of current traveling through the coil.” ’153 patent at 2:14-19. Nonetheless, the specification plainly teaches a “virtual card” for communicating via a “mobile cellular phone,” which obviously does not have a magnetic stripe, by use of “RF signals.” ’153 patent at 14:19-35. The specification therefore contemplates an emulator in a form other than a magnetic stripe. Again, “the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.” *GE Lighting Sols.*, 750 F.3d at 1309. Respondents identify nothing that might qualify as either lexicography or disavowal to otherwise support their position.

Accordingly, “magnetic stripe emulator” is given its plain and ordinary meaning: “a device that emulates a magnetic stripe.”

² Respondents cite a prior art patent that discusses and illustrates a magnetic stripe emulator as a stripe. RIMB at 38. However, Respondents do not explain how this prior art, which is not part of the present patent’s family, is relevant to construction of the present terms.

4. '631 Patent - "dynamic magnetic stripe communication device"

Relevant Claims	Dynamics' Construction	Samsung's construction
1	Proposed construction: "a device that can reproduce the function of a magnetic stripe and that can communicate dynamically changeable information" Supporting evidence: '631 Patent at 1:30-32, 1:61-63, 5:54-57, 12:32-46, 13:23-25, Fig. 12, Claims 1, 9, 11, and 19 Zatkovich Dec. at ¶¶35-36, 57-60	Proposed construction: "a device in a magnetic stripe form that can communicate dynamic magnetic information" Supporting evidence: '631 Patent at 8:17-23, 8:60-65, 11:28-30, 12:3-4, 14:10-12, Fig. 3, Fig. 4, Fig. 10, Claim 1 '545 Patent at Claim 1 '100 Patent at Claim 1 '153 Patent at Fig. 1 Ex. 21 (2016-08-01 Preliminary Amendment) at 3 Lipoff Decl., ¶¶ 58-61

(JC at 5.)

As the Respondents point out, the dispute with respect to this term "is whether 'dynamic magnetic stripe communication device' requires a particular structure in the form of a magnetic stripe . . . or whether it only requires the ability to communicate magnetic stripe data." RIMB at 28. Complainant submits that the term "merely requires a device capable of communicating dynamic magnetic stripe data." CIMB at 20. Complainant submits that magnetic stripe data is a standard type of data used by the financial industry for credit card transactions, and it is known to those skilled in the art that the transmission of magnetic stripe data is the primary function a magnetic stripe. Thus, Complainants argue, one of ordinary skill in the art would view a dynamic magnetic stripe communication device as a device that reproduces the function of communicating magnetic stripe data. *Id.* However, Complainants further argue that the specification and claims do not limit this term to a specific shape and form; the device need only be able to include the functionality of a magnetic stripe. CRMB at 16-17.

Respondents submit that the specification never describes or uses the term "dynamic magnetic stripe communication device," and moreover, it is not a term that has an ordinary meaning.

Hr'g Tr. at 74. The Respondents argue that the specification teaches the meaning of the term, and what is disclosed in the patent is that the device is in the form of a magnetic stripe. *Id.* Respondents further explain that claim 1 describes an apparatus comprised of three structures: a structure for receiving manual input, a dynamic magnetic stripe communication device, and a processor for controlling the dynamic magnetic stripe communication device. The second term, therefore, is a structural limitation limiting the device to the form of a magnetic stripe. RIMB at 29.

The '631 specification reveals that the term is not as narrow as Respondents contend. The specification teaches that the invention relates to "a credit card or security card," although it may be a telephone, media player, or other electronic device, "that may transmit information to a magnetic stripe reader via a magnetic emulator." '631 patent at 1: 28-30, 12:33-34. The magnetic emulator, in turn, is described as "a multi-purpose emulator" that "may be operated to electrically couple, and transmit data to, devices other than a magnetic stripe reader. For example, a magnetic emulator may be operated to electrically couple, and transmit data to, a device using a Radio Frequency Identification (RFID) protocol." *Id.* at 2:7-12. The specification further teaches that "FIG. 5 shows flow chart 510 that may [include] steps 511-513. Step 511 may be utilized to determine, [for] example, whether an RFID or a magnetic stripe reader is within the proximity of a card (or other device). Step 512 may be utilized to run an emulator as an RFID or magnetic stripe in response to step 511." *Id.* at 7:53-58. The specification further teaches an electronic device that may be a portable telephone, in which the "functionality of a card may be provided on a personal device and displayed through a graphical user interface. . . and may communicate to a card reader such as, for example, an RFID reader." *Id.* at 12:32-47. Furthermore, Fig. 8 of the specification illustrates an emulator 851, which communicates with a magnetic stripe reader, and is not in the shape of a stripe.

Thus, the magnetic stripe communication device is not limited to a particular shape or form, but can be any device capable of transmitting magnetic stripe information. And the term "dynamic"

refers to the data communicated, because the data may “change based on time.” ’631 patent at 2:55. So the scope of the claim is closer to the Complainant’s proposed construction, although the information communicated must be magnetic stripe data, as opposed to data in another format, such as might be communicated using RFID chips, “dynamically changeable information” (as Complainants propose), or “dynamic magnetic information” (as Respondents propose). Therefore, “dynamic magnetic stripe communication device” is properly construed as “a device capable of communicating dynamic magnetic stripe data.”

5. ’631 Patent – “serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal”

Relevant Claims	Dynamics’ Construction	Samsung’s construction
1	Proposed construction: “serially communicate first magnetic stripe track data and serially communicate second magnetic stripe track data while electrically coupled to the payment terminal” Supporting evidence: ’631 Patent at 1:34-39, 2:29-47, 4:40-45, Claims 1 and 16	Proposed construction: “send one non-overlapping transmission of first magnetic stripe track data and second magnetic stripe track data, one after the other, without interruption of electrical coupling to the payment terminal” Supporting evidence: ’631 Patent at 1:34-39, 1:48-55, 4:36-40, Claim 22 Ex. 22 (<i>McGraw-Hill</i>, Dictionary of Computing & Communications) <i>Toro Co. v. Textron, Inc.</i>, 502 F. Supp. 2d 904, 909 (D. Minn. 2007) (defining “serially” as “in a sequential arrangement”) <i>TM Patents, L.P. v. Int’l Bus. Machines Corp.</i>, 72 F. Supp. 2d 370, 394 (S.D.N.Y.) (“serially meaning in sequence, one element after another”)

(JC at 6.)

During the hearing, Complainant described the construction dispute of this term as “whether or not serially communicating can be done in an overlapping and a non-overlapping manner or not.” Hr’g Tr. at 123. Specifically, Complainant states that in the claim, “[t]wo sets of data are

transmitted. Those sets of data must be transmitted serially (meaning one begins after the other).” CIMB at 22. Complainant contends that “serial” communications require only that the communications “need only begin or end at different times, and are not limited to non-overlapping communications.” CRMB at 19. Thus, according to Complainants, the term “serially” modifies each communication of track data, *i.e.*, each individual track must be serially communicated, but does not prohibit communication of two tracks at once. And during the hearing, Complainant agreed that the term “electrically coupled” is equivalent to its original proposed language “transmitting data detectable by the payment terminal.” Hr’g Tr. at 126.

Respondents, on the other hand, argue that in order to give meaning to the term “serially” in the claim, one must construe the claim to mean that the first magnetic stripe track data is communicated, and then the second magnetic stripe track data is communicated. RIMB at 34-35. Thus, “serially,” according to Respondents, modifies “communicate,” *i.e.*, the transmission of the first track and second track data must be communicated serially, because if the transmissions of the track data overlap, then the communication is parallel and not serial. *Id.* Respondents add an additional dispute over the construction: they argue that the term “while electrically coupled to the payment terminal” must be construed to mean “without interruption of electrical coupling to the payment terminal.” Thus, according to Respondents, the electrical coupling cannot stop during serial communication or the communication could not occur. *Id.*

Respondents’ second point is easily resolved: the specification contains nothing suggesting the term “electrically coupled to the payment terminal” must be limited to “without interruption of electrical coupling to the payment terminal.” In fact, claim 22 adds to claim 1 the limitation of “temporal pauses . . . between the serial communications,” so even the electrical coupling required in claim 1 could presumably be interrupted during such “pauses.”

Claim 22 does not help with resolving the first dispute, however; it is unclear whether “between” refers to just two communications (corresponding to the two track data sets), or to many communications (implied by the use of the plural “pauses”), so it sheds little light on what language “serially” modifies. *See* CRMB at 19; RIMB at 35. Claim 19, by contrast, recites that the device further “serially communicates third magnetic stripe track data.” This suggests that “serially” modifies the communication of each stripe track data, rather than how the track data are communicated with respect to each other.

Lastly, although the specification does distinguish between serial and parallel operation (*see, e.g.,* ’631 patent at 1:46-59), it describes parallel operation as involving, in one example, “instantaneous data.” ’631 patent at 1:39. This implies that “parallel” communication could involve both parallel, instantaneous transmission of a single track of magnetic stripe data, as well as parallel, simultaneous transmission of two different tracks of magnetic stripe data, and so does not aid in resolving the disputed issue. *Cf.* RIMB at 35-36.

Accordingly, the proper construction of “serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal” is “serially communicate first magnetic stripe track data and serially communicate second magnetic stripe track data while electrically coupled to the payment terminal.”

6. '631 Patent - “operable to electrically couple to a payment terminal . . . and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal”

Relevant Claims	Dynamics' Construction	Samsung's construction
1	Proposed construction: “operable to electrically couple to a payment terminal by communicating data to the payment terminal... and to serially communicate first magnetic stripe track data and serially communicate second magnetic stripe track data while electrically coupled to the payment terminal” Supporting evidence: '631 Patent at 1:34-39, 2:29-47, 4:40-45, 8:52-65, Claim 1	Proposed construction: “operable to electrically couple to a payment terminal . . . and also to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal” Supporting evidence: '545 Patent at 1:30-34, 1:52-55, 1:65-2:2, 2:7-9, 2:33-37, 4:11-14, 4:48-51, 5:7-11, 5:59-60, 6:3-8, 8:40-41, 8:60-65, 9:18-20, 11:1-2, Fig. 7, Claim 1, Claim 9 Ex. 18 (Hargraves Communications Dictionary) Lipoff Decl., ¶¶ 50-57

(JC at 7.)

As Complainant points out, “the only difference between this claim term and the claim term in the preceding section is the term ‘operable to electrically couple to a payment terminal.’” CRMB at 20. Complainant argues that the claim recites an apparatus, and thus, these terms recite a device that is operable to electrically couple, and is also operable to serially communicate, without sequence limitations (the second part of this term was discussed above). CIMB at 24-25. In particular, Complainant contends that the coupling may occur “by communicating data to the payment terminal.” JC at 7.

Respondents submit that Complainant’s proposed construction essentially reads out the “electrically couple to” requirement of the claim. RIMB at 25. Respondents argue that the claim “clearly distinguishes coupling and communication as two distinct operations . . . [and] that the

independent act of coupling is necessary before and during the act of communicating the magnetic stripe data.” *Id.* at 25-26. As Respondents explained at the hearing, “coupling is not inherent in the communication of data.” Hr’g Tr. at 118.

Two observations shed light on the proper scope of this claim term. First, although the ‘631 patent does not define “couple,” the specification consistently uses that word alongside acts of data transmission or delivery (*i.e.*, data communication). For instance, the specification describes “coupling” as: “emit[ting] electromagnetic fields operable to electrically couple . . . such that data may be transmitted” from the claimed apparatus to a magnetic stripe reader (‘631 patent at 1:31-34); “electrically coupl[ing], and transmit[ting] data to, a device using [an RFID] protocol” (*id.* at 2:10-11); “electrically coupl[ing] with a read-head from a magnetic stripe reader without making physical contact with the read-head” (*id.* at 1:67-2:2); “a circuit may be provided . . . that is operable to receive data . . . [and] may electrically couple with an RFID transmitter and/or magnetic stripe reader and deliver information to a processor” located in the claimed invention (*id.* at 2:33-37). This last example specifically characterizes the coupling as permitting the claimed invention to “communicate bi-directionally,” suggesting that coupling is broader than any one type of communication. *Id.* at 2:38.

Second, the claims themselves suggest that electrical coupling happens when two components electrically interact with each other. Claim 1 states, “wherein the dynamic magnetic stripe communication device is operable to electrically couple to a payment terminal when the dynamic magnetic stripe communication device is located outside and within proximity of the payment terminal.” ‘631 patent at cl. 1. Claim 9 similarly states, “determine presence of a read-head of a magnetic stripe reader based on received information; and drive the dynamic magnetic stripe communication device to couple with the magnetic stripe reader.” *Id.* at cl. 9. In this way the claims link “coupling” with the physical distance between the electrical components and the

“driv[ing]” of one of them, which seemingly means generation of an electrical signal. Thus, electrical coupling refers to a general state of electrical interaction between two devices, which is necessarily broader than just electrical communication of data. For example, wireless smartphone charging is certainly an electrical coupling, yet no data is communicated. Similarly, a household appliance is electrically coupled to a power source when it is plugged into a wall socket, yet, again, no data is communicated.

Of course, if two devices are in electrical communication with one another, then they are necessarily also electrically coupled, as communication is a form of interaction. So Respondents’ position, that coupling and communication are entirely distinct and entail two separate operations, is too narrow. But these two operations should still not be conflated, because coupling does not necessarily imply communication, as opposed to, say, power transmission. So Complainants’ position, that the coupling only occurs by data communication, is similarly too narrow.

Instead, the better approach is to treat electrical coupling as a genus, electrical communication of data as a species, and electrical communication of magnetic stripe track data as a subspecies. So understood, a device that is operable to “serially communicate” multiple tracks of magnetic stripe data “while electrically coupled to the payment terminal” necessarily also is “operable to electrically couple to [the] payment terminal.” By contrast, a device that is operable to communicate only some other form of data, to electrically couple but without communication, or to communicate only in a non-electrical fashion, does not satisfy the claim limitation.

Such a construction does not read any limitation out of claim 1, as Respondents contend. The “serially communicate” portion of the claim specifically requires communication of two different sets of “magnetic stripe track data,” and not just any data at all. And the last clause in claim 1, “while electrically coupled to the claim terminal,” is similarly given full effect, because it

requires communication simultaneously with electrical coupling, as opposed to, say, physical contact.

Accordingly, the proper construction of this term is that it requires electrical coupling and communication of magnetic stripe track data, wherein electrical communication of the latter necessarily but not exclusively accomplishes the former. With that understanding, the term “operable to electrically couple to a payment terminal . . . and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal” is properly construed according to its plain language, that is, as “operable to electrically couple to a payment terminal . . . and to serially communicate first magnetic stripe track data and second magnetic stripe track data while electrically coupled to the payment terminal.”

7. ‘631 Patent – “within proximity of”

Relevant Claims	Dynamics’ Construction	Samsung’s construction
1	Proposed construction: Plain and ordinary meaning Supporting evidence: ’631 Patent at 1:60-2:6, 8:29-39, Claim 1	Proposed construction: Indefinite Supporting evidence: ’631 Patent at 2:2-6, 8:35-37, Claim 1

JC at 7.

Complainant submits that this term is understandable to a person of ordinary skill in the art, and that it means “exactly what the words say – to be within proximity of . . . a payment terminal.” CIMB at 25. Therefore, Complainant requests that I decline to construe this term, “as it is definite and comports with the plain and ordinary meaning of the terms recited therein.” *Id.*

Respondents argue that the term is indefinite because while the ‘631 patent defines a lower limit of distance, it fails to describe an upper bound of what can be considered within proximity of payment terminal. RIMB at 27. Thus, this term “provides no reasonable certainty as to the scope of claim 1.” *Id.* Respondents cite the Supreme Court case, *Nautilus, Inc. v. Biosig Instruments*,

Inc., 572 U.S. 898 (2014), in which the Court instructed that a “patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Id.* at 898-899.

Interestingly, the Supreme Court remanded the *Nautilus* case, telling the Federal Circuit to use the above articulated standard to determine if the claim term “a live electrode and a common electrode *mounted . . . in spaced relationship*” is indefinite. *Id.* at 913 (emphasis mine). On remand from the Supreme Court, the Federal Circuit agreed with the inventor that “skilled artisans can determine the ‘spaced relationship’ between live and common electrodes by calculating the point in which EMG signals are substantially removed.” *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1384 (Fed. Cir. 2015). In the present case, Complainants argue that one skilled in the art would know, given that if the lower bound is a quarter of an inch, the device would not work if it were three feet away from the purchase transaction. Hr’g Tr. at 156-57. I agree. One skilled in the art, reading the ’631 patent specification can ascertain the meaning of “within proximity” with reasonable certainty to determine “when a device is sufficiently ‘within proximity of’ a point of sale terminal to carry out a contactless purchase transaction.” CRMB at 21-22.

Respondents also cite a United States District Court case, *Abdou v. Alphatec Spine, Inc.*, No. 12-CV-1804 BEN (RBB), 2014 WL 6611422, at *1 (S.D. Cal. Nov. 19, 2014), in which the court found the claim language “in proximity to” to be indefinite. The claims were directed to “devices and methods to target, access, and perform surgical work in the intervertebral space with minimal tissue dissection.” *Id.* at *1. The claims contained a number of terms that the Court found to be indefinite because of a lack of guidance in the patent; this included “in proximity to,” which “describe[d] the distance between the target location apparatus and the first vertebral bone.” *Id.* at *8-9.

The '631 patent, by contrast, provides significant guidance to a skilled artisan: “an emulator that is driven with increased current can be operable to couple with the read-head of a magnetic stripe reader even when placed outside and within the proximity the of (*e.g.*, 0.25 inches) the read-head.” '631 patent at 2:2-5. It stands to reason that a skilled artisan, whom I have defined as a person with experience in the use of magnetic fields to convey information, would understand “proximity” to mean “close enough”—as Respondents put it during the hearing—to communicate, transmit, or couple (Hr’g Tr. at 155), and would be able to ascertain the outer limits of that proximity; *i.e.*, the effective range of the fields. Hr’g Tr. at 155.

Therefore, this term is not indefinite. Moreover, although Complainant requests no construction at all, it is appropriate to simply assign it its plain and ordinary meaning, without specific distances, because “close enough” is a distance that would be expected to change depending on circumstances. Accordingly, the proper construction of “within proximity of” is “within proximity of.”

8. '631 Patent - “virtual payment card”

Relevant Claims	Dynamics’ Construction	Samsung’s construction
6, 7	Proposed construction: “a visual representation of a payment card” Supporting evidence: '631 Patent at Figs. 1, 10, 12, Claims 6 and 7	Proposed construction: “an image of a payment card” Supporting evidence: '545 Patent at 3:42-48, 12:26-29, 12:32-37, 12:39-40, 12:42-45, Fig. 1, Fig. 12 '153 Patent at 6:4-7 Ex. 28 (New Shorter Oxford English Dictionary)

(JC at 8.)

The dispute over this term is whether “virtual” means only a representation, displayed on a screen, that includes payment account information, or instead means an image of a physical card. Complainant asserts that the specification does not limit the term to an image of a physical card. Respondents assert that both the plain meaning of virtual and the teaching in the specification require

that the term means that an image of an actual card is displayed. Respondents agreed that the term “physical payment card” or “actual payment card” is acceptable. Hr’g Tr. at 148.

A virtual payment card is taught in the specification with reference to Fig. 12. Fig. 12 illustrates a rectangular screen 1210 containing a rectangular image 1220 enclosing certain features, including a card number, name, and security (CVCC) code, just as an actual credit card would have. Image 1220 also includes at least one virtual button 1230 not found on an actual card, and fails to include multiple features and information normally found on a credit card, including a logo, expiration date, issuer, magnetic stripe, and (as of 2020, anyway) computer chip. In short, the preferred embodiment only somewhat resembles an actual card, and as between the parties’ competing constructions, it is plainly more of a “visual representation” of a card than an “image” of one.

Therefore, the proper construction of “virtual payment card” is “a visual representation of a payment card.”

9. ’545 Patent – “operable to electrically couple [the device] to a payment terminal and to communicate [data in magnetic stripe data format/magnetic stripe data] to the payment terminal”

Relevant Claims	Dynamics’ Construction	Samsung’s construction
1, 9, dependent claims	Proposed construction: “operable to electrically couple to a payment terminal by communicating data to the payment terminal, said data being [in magnetic stripe data format / magnetic stripe data]” Supporting evidence: ’545 Patent at 1:30-44, 8:52-65, Claims 1 and 9	Proposed construction: “operable to electrically couple [the device] to the payment terminal and also to communicate [data in a magnetic stripe data format / magnetic stripe data] to the payment terminal” Supporting evidence: ’545 Patent at 1:30-34, 1:52-55, 1:65-2:2, 2:7-9, 2:33-37, 4:11-14, 4:48-51, 5:7-11, 5:59-60, 6:3-8, 8:40-41, 11:1-2, Claim 1, Claim 9 Ex. 18 (Hargraves Communications Dictionary) Lipoff Decl., ¶¶ 50-57

(JC at 9)

The parties agree that this term is nearly identical to the language in claim 1 of the '631 patent, and thus, the construction can presumably be the same. Hr'g Tr. at 79. Nonetheless, the term "serially" and the references to "first" and "second" track data is absent from both the claim language and the proposed constructions, so that language is omitted. Accordingly, the term "operable to electrically couple [the device] to a payment terminal and to communicate [data in magnetic stripe data format/magnetic stripe data] to the payment terminal" is properly construed as "operable to electrically couple [the device] to a payment terminal and to communicate [data in magnetic stripe data format/magnetic stripe data] to the payment terminal."

10. '545 Patent - "within proximity of"

Relevant Claims	Dynamics' Construction	Samsung's construction
8 and 16	Proposed construction: Plain and ordinary meaning Supporting evidence: '545 Patent at 1:60-2:6, 8:29-39, Claims 8 and 16	Proposed construction: Indefinite Supporting evidence: '545 Patent at 2:10-11, 5:62-67, 7:56-58, Claim 8, Claim 16

(JC at 9.)

Complainant states that this term is identical to that recited in the '631 patent, and thus, the construction should be the same. Respondents, on the other hand, state that this term is different because the "'proximity' term's use in the '545 patent is for an entirely different technology, RFID, rather than its use in the '631 patent with reference to magnetic emulation." RRMB at 10. Respondents further assert that the '545 patent "provides no details about its implementation of RFID technology in the alleged invention." *Id.*

To be sure, the '545 patent claims RFID technology rather than magnetic emulation. However, there is nothing in the record to indicate that RFID technology requires more specific information, or that one skilled in the art would need more information, than that required by

emulation of magnetic stripes. Again, it stands to reason that a skilled artisan would understand “proximity” to mean “close enough to successfully communicate the desired data,” or within the effective range of the transmitted RF signal, and would be able to ascertain the outer limits of that proximity.

Therefore, I do not find the term to be indefinite and the proper construction of the term “within proximity of” is “within proximity of.”

11. '545 Patent – “virtual payment card”

Relevant Claims	Dynamics' Construction	Samsung's construction
5, 6, 13, 14	Proposed construction: “a visual representation of a payment card” Supporting evidence: '545 Patent at Figs. 1, 10, 12, Claims 5, 6, 13, and 14	Proposed construction: “an image of a payment card” Supporting evidence: '545 Patent at 3:42-48, 12:26-29, 12:32-37, 12:39-40, 12:42-45, Fig. 1, Fig. 12 '153 Patent at 6:4-7 Ex. 28 (New Shorter Oxford English Dictionary)

(JC at 10)

The parties agree that this term is nearly identical to the language in claims 6 and 7 of the '631 patent, and thus, the construction can be the same. Hr'g Tr. at 135. Therefore, the proper construction of “virtual payment card” is “a visual representation of a payment card.”

12. '100 Patent – “operable to emit an electromagnetic field and to electrically couple to, and transmit data to, a read-head located on a magnetic stripe reader”

Relevant Claims	Dynamics' Construction	Samsung's construction
1, 12, dependent claims	Proposed construction: “operable to emit an electromagnetic field, that electrically couples to and transmits data to a read-head located on a magnetic stripe reader” Supporting evidence:	Proposed construction: “operable to emit an electromagnetic field and to electrically couple to a read head located on a magnetic stripe reader and also transmit data to the read head located on a magnetic stripe reader” Supporting evidence: '545 Patent at 1:30-34, 1:52-55, 1:65-2:2,

	'100 Patent at 1:28-34, Claims 1 and 12 Zatkovich Dec. at ¶¶49-51	2:7-9, 2:33-37, 4:11-14, 4:48-51, 5:7-11, 5:59-60, 6:3-8, 8:40-41, 11:1-2, Claim 1, Claim 9, Ex. 18 (Hargraves Communications Dictionary) Lipoff Decl., ¶¶ 50-57
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(JC at 4)

The parties agree that this term is nearly identical to the language in claim 1 of the '631 patent, and thus, the construction can be the same. Hr'g Tr. at 79. However, the language of this claim term sufficiently deviates from the corresponding language of claim 1 of the '631 patent that further briefing is required on the exact construction—although I do not expect that such briefing will be difficult. Therefore, I defer ruling on the proper construction of this term.

13. '100 Patent – “virtual card”

Relevant Claims	Dynamics' Construction	Samsung's construction
6, 7, 16, 17	Proposed construction: “a visual representation of a card” Supporting evidence: '100 Patent at Figs. 1, 10, 12, Claims 6, 7, 16, and 17	Proposed construction: “an image of a payment card” Supporting evidence: '545 Patent at 3:42-48, 12:26-29, 12:32-37, 12:39-40, 12:42-45, Fig. 1, Fig. 12 '153 Patent at 6:4-7 Ex. 28 (New Shorter Oxford English Dictionary)Lipoff Decl., ¶¶ 58-61

(JC at 4)

The parties agree that this term is nearly identical to the language in claims 6 and 7 of the '631 patent, and thus, the construction can be the same. Hr'g Tr. at 135. Therefore, the proper construction of "virtual card" is "a visual representation of a payment card."

SO ORDERED.

A handwritten signature in black ink, appearing to read "C. Elliot", written over a horizontal line.

Cameron Elliot
Administrative Law Judge

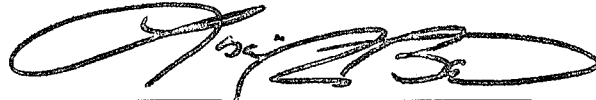
**CERTAIN MOBILE DEVICES WITH MULTIFUNCTION
EMULATORS**

INV. NO. 337-TA-1170

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **Order No. 7** has been served by hand upon the Commission Investigative Staff and the following parties as indicated, on

JAN 31 2020



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