

In the Matter of

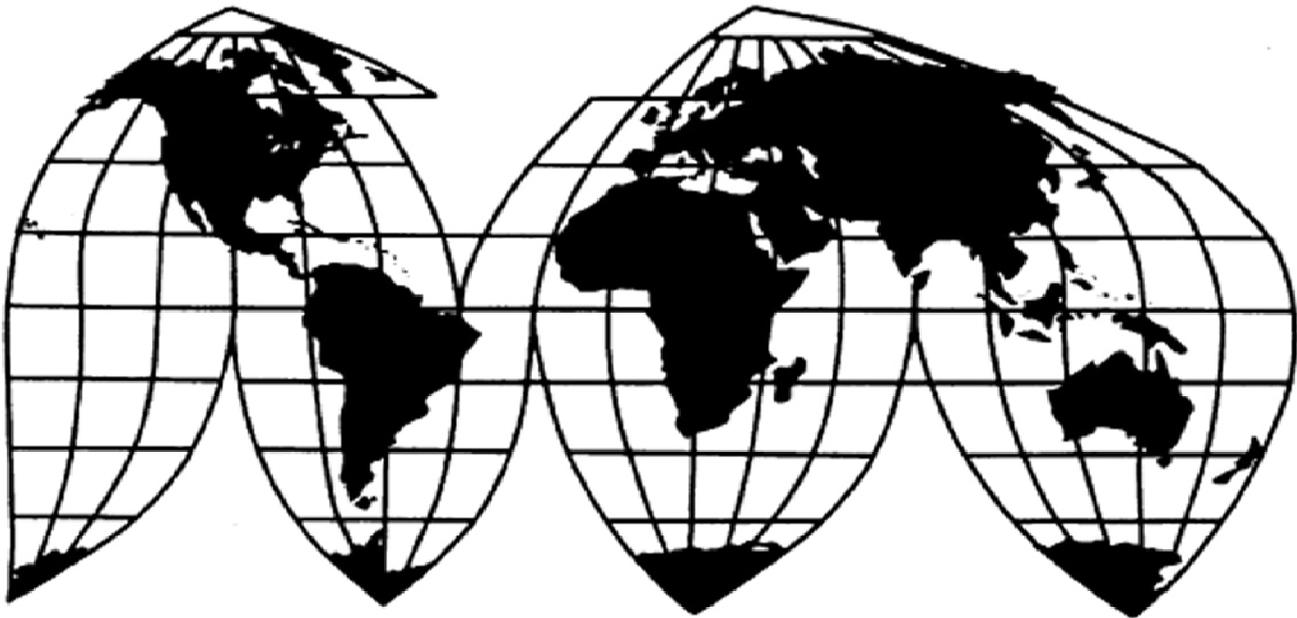
**Certain NOR and NAND Flash
Memory Devices and Products
Containing the Same**

Investigation No. 337-TA-560

Publication 4013

June 2008

U.S. International Trade Commission



Washington, DC 20436

U.S. International Trade Commission

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*Commissioner Irving A. Williamson, whose term commenced on February 7, 2007, and Commissioner Dean A. Pinkert, whose term commenced on February 26, 2007, participated in the decision not to review the Initial Determination of no violation. Commissioner Stephen Koplan, whose term ended on February 6, 2007, and Commissioner Jennifer A. Hillman, whose term ended on February 23, 2007, participated in the decision to institute this investigation.

Address all communications to
Secretary to the Commission
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Washington, DC 20436

U.S. International Trade Commission

Washington, DC 20436
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In the Matter of

Certain NOR and NAND Flash Memory Devices and Products Containing the Same

Investigation No. 337-TA-560



UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C. 20436

In the Matter of

**CERTAIN NOR AND NAND FLASH
MEMORY DEVICES AND PRODUCTS
CONTAINING THE SAME**

Investigation No. 337-TA-560

**NOTICE OF COMMISSION DECISION NOT TO REVIEW
THE INITIAL DETERMINATION OF NO VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON REMEDY AND BOND;
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 not to review a final initial determination ("ID") issued by the presiding administrative law judge ("ALJ") regarding whether there is a violation of section 337 of the Tariff Act of 1930 in the above-captioned investigation.

FOR FURTHER INFORMATION CONTACT: Paul M. Bartkowski, Esq., Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 708-5432. Copies of non-confidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone (202) 205-2000. General information concerning the Commission may also be obtained by accessing its Internet server at <http://www.usitc.gov>. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at <http://edis.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: This investigation was instituted on February 13, 2006, based on a complaint filed by SanDisk Corporation of Sunnyvale, California. The complaint alleges violations of section 337 of the Tariff Act of 1930 (19 U.S.C. § 1337) in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same by reason of infringement of various claims of United States Patent Nos. 5,172,338 ("the '338 patent"); 5,991,517 ("the '517 patent"); and 6,542,956 ("the '956 patent"). The complaint

named two respondents: STMicroelectronics N.V. of Geneva, Switzerland and STMicroelectronics, Inc. of Carrollton, Texas (collectively, "ST")

On May 17, 2006, the ALJ granted, by an ID issued June 1, 2006, SanDisk's motion for partial termination of the investigation with respect to the '956 patent. The Commission issued a notice that it determined not to review the ID on June 19, 2006.

On June 1, 2007, the ALJ issued the final ID finding no violation 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 NOR and NAND flash memory devices and products containing the same in connection with the asserted claims of the '517 and '338 patents. No petitions for review of the ID were filed. The Commission has determined not to review the ID.

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 section 210.42 of the Commission's Rules of Practice and Procedure (19 C.F.R. § 210.42).

By order of the Commission.

A handwritten signature in black ink, appearing to read "Marilyn R. Abbott", written in a cursive style.

Marilyn R. Abbott
Secretary to the Commission

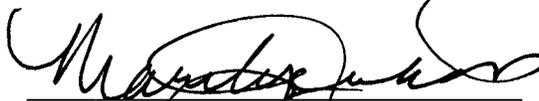
Issued: July 13, 2007

**CERTAIN NOR AND NAND FLASH MEMORY DEVICES
AND PRODUCTS CONTAINING SAME**

337-TA-560

CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **NOTICE OF COMMISSION DECISION NOT TO REVIEW THE INITIAL DETERMINATION OF NO VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND; TERMINATION OF INVESTIGATION** has been served by hand upon the Commission Investigative Attorney, David O. Lloyd, Esq., and the following parties as indicated, on July 20, 2007.



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UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

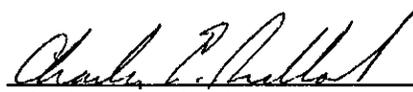
**CERTAIN NOR AND NAND FLASH MEMORY
DEVICES AND PRODUCTS CONTAINING SAME**

Inv. No. 337-TA-560

NOTICE REGARDING INITIAL DETERMINATION

(June 1, 2007)

On this date, the undersigned issued an initial determination on violation of section 337 and recommended determination on remedy and bond in the above-referenced investigation. Attached are pages 1-2 and 142-45 from said filing, which are a matter of public record. A complete public version of the Initial Determination and Recommended Determination on Remedy and Bond will be issued when all the parties have submitted their redactions and the undersigned has had an opportunity to review the redactions.



Charles E. Bullock
Administrative Law Judge

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN NOR AND NAND FLASH MEMORY
DEVICES AND PRODUCTS CONTAINING SAME**

Inv. No. 337-TA-560

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

Administrative Law Judge Charles E. Bullock

(June 1, 2007)

Appearances:

For the Complainant SanDisk Corporation:

James C. Yoon, Esq.; Michael A. Ladra, Esq.; Julie M. Holloway, Esq.; Ron E. Shulman, Esq.; of Wilson, Sonsini, Goodrich & Rosati of Palo Alto, California

Nicole W. Stafford, Esq.; and Dion Messer, Esq.; of Wilson, Sonsini, Goodrich & Rosati of Austin, Texas

For the Respondents STMicroelectronics N.V. and STMicroelectronics, Inc.:

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Richard Goldenberg, Esq.; of Wilmer, Cutler, Pickering, Hale and Door, of Boston, Massachusetts

For the Commission Investigative Staff:

Lynn I. Levine, Esq., Director; Thomas S. Fusco, Esq., Supervising Attorney; David Lloyd, Esq., Investigative Attorney; of the Office of Unfair Import Investigations, U.S. International Trade Commission, of Washington, D.C.

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

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In the Matter of

**CERTAIN NOR AND NAND FLASH MEMORY
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Inv. No. 337-TA-560

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

Administrative Law Judge Charles E. Bullock

(June 1, 2007)

Pursuant to the Notice of Investigation¹ and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is the Administrative Law Judge's Initial Determination in the matter of Certain NOR and NAND flash memory devices and products containing same, Investigation No. 337-TA-560.

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 and has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 8, 9, 11,

¹ 70 Fed. Reg. 61,841 (October 26, 2005).

27, 28, 32, 50, 51, and 64 of U.S. Patent No. 5,172,338. Furthermore, the Administrative Law Judge hereby determines that a domestic industry in the United States exists that practices U.S. Patent No. 5,991,517 and does not exist that practices U.S. Patent No. 5,172,338.

CONCLUSIONS OF LAW

1. The Commission has subject matter jurisdiction in this investigation.
2. The Commission has personal jurisdiction over ST.
3. ST's accused NAND products infringe claims 1, 3, 5, 6, 7, 8, and 10 of U.S. Patent No. 5,991,517 in violation of 35 U.S.C. § 271(a). In addition, all of ST's accused NAND products indirectly infringe these claims.
4. ST's accused NAND products do not infringe claims 12, 13, and 14 of U.S. Patent No. 5,991,517 in violation of 35 U.S.C. § 271(a).
5. ST's accused NOR products do not infringe claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 in violation of 35 U.S.C. § 271(a).
6. An industry in the United States exists with respect to SanDisk's products that is protected by claim 1, 3, 5, 6, 7, 8, 10, and 12 of U.S. Patent No. 5,991,517, as required by 19 U.S.C. § 1337(a)(2) and (3).
7. An industry in the United States does not exist with respect to SanDisk's products that is protected by any claim of U.S. Patent No. 5,172,338, as required by 19 U.S.C. § 1337(a)(2) and (3).
8. Claims 1, 6, and 10 of U.S. Patent No. 5,991,517 are invalid under 35 U.S.C. § 102 for anticipation based on the GB '145 prior art reference.
9. Claims 1, 3, 5, 6, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 are not invalid under 35 U.S.C. § 102 for anticipation based the '179 patent.
10. Claims 1, 6, and 10 of U.S. Patent No. 5,991,517 are not invalid under 35 U.S.C. § 102 for anticipation based the M293 prior art reference.

11. Claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 are invalid under 35 U.S.C. § 103 for obviousness based on JP100 by itself, or in combination with the '179 patent and/or the '344 patent.
12. Claims 1, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 are not invalid under 35 U.S.C. § 103 for obviousness based on JP100 in combination with the '871 patent and/or the '541 patent.

INITIAL DETERMINATION

Based on the foregoing opinion, findings of fact, conclusions of law, the evidence, and the record as a whole, and having considered all pleadings and arguments, including the proposed findings of fact and conclusions of law, it is the Administrative Law Judge's Initial Determination that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 and has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 8, 9, 11, 27, 28, 32, 50, 51, and 64 of U.S. Patent No. 5,172,338. Furthermore, the Administrative Law Judge hereby determines that a domestic industry in the United States exists that practices U.S. Patent No. 5,991,517 and does not exist that practices U.S. Patent No. 5,172,338.

The Administrative Law Judge hereby CERTIFIES 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 by the Administrative Law Judge; and further the exhibits accepted into evidence in this investigation as listed in the attached exhibit lists.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review 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

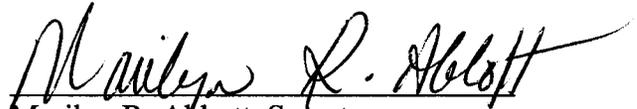
Determination or certain issues therein.

**IN THE MATTER OF CERTAIN NOR AND FLASH
MEMORY DEVICES AND PRODUCTS CONTAINING SAME**

337-TA-560

CERTIFICATE OF SERVICE

I, Marilyn R. Abbott, hereby certify that the attached **ORDER** was served upon, **David O. Lloyd, Esq.**, Commission Investigative Attorney, and the following parties via first class mail and air mail where necessary on June 1, 2007.



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**IN THE MATTER OF CERTAIN NOR AND FLASH
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337-TA-560

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PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN NOR AND NAND FLASH MEMORY
DEVICES AND PRODUCTS CONTAINING SAME**

Inv. No. 337-TA-560

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

Administrative Law Judge Charles E. Bullock

(June 1, 2007)

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Richard Goldenberg, Esq.; of Wilmer, Cutler, Pickering, Hale and Door, of Boston, Massachusetts

For the Commission Investigative Staff:

Lynn I. Levine, Esq., Director; Thomas S. Fusco, Esq., Supervising Attorney; David Lloyd, Esq., Investigative Attorney; of the Office of Unfair Import Investigations, U.S. International Trade Commission, of Washington, D.C.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS	viii
DISCUSSION	3
I. Introduction	3
A. Procedural History	3
1. Prior Investigations	3
a. Inv. No. 337-TA-382	3
b. Inv. No. 337-TA-526	3
2. Current Investigation	4
B. The Parties	12
1. Complainant	12
2. Respondents	12
C. Overview of the Technology	12
D. The Patents at Issue	13
1. The ‘338 Patent	13
2. The ‘517 Patent	14
E. The Products at Issue	14
1. SanDisk’s Products	14
2. ST’s Products	15
II. Jurisdiction and Importation	16
A. Subject Matter Jurisdiction	16
B. Personal Jurisdiction	17

III.	Relevant Law	17
A.	Claim Construction	17
B.	Infringement	22
1.	Literal Infringement	22
2.	Indirect Infringement	23
C.	Domestic Industry	24
D.	Validity	26
1.	Anticipation, 35 U.S.C. §§ 102 (a), (b) and (e)	27
2.	Obviousness, 35 U.S.C. § 103 (a)	28
3.	Written Description/Enablement, 35 U.S.C. § 112, ¶ 1	31
E.	Enforceability	33
1.	Inequitable Conduct	33
2.	Improper Inventorship, 35 U.S.C. § 102(f)	35
IV.	The ‘338 Patent	37
V.	The ‘517 Patent	46
A.	Claim Construction	46
1.	Asserted Claims	46
2.	Disputed Claim Terms	47
a.	Claim 1 - In General	47
b.	“EEPROM system” (claim 1)	51
c.	“Electrically floating gate” (claim 1)	52
d.	“Alterable” (claim 1)	53

e.	“Appropriate voltage conditions” (claim 1)	54
f.	“Applying said appropriate voltage conditions in parallel to a plurality of said memory cells” (claims 1 and 7)	56
g.	“Determining the threshold level ranges in which individual ones of said plurality of memory cells lie” (claim 1)	58
h.	“Terminating said application of appropriate voltage conditions to individual ones of said plurality of memory cells” (claim 1)	62
i.	“Continuing to apply said appropriate voltage conditions to others of said plurality of cells” (claim 1)	65
j.	“Until all of the plurality of cells are determined to have reached their desired threshold level ranges” (claim 1)	67
k.	“Breakpoint threshold level” (claim 5)	70
l.	“Blocks” (claims 7 and 8)	70
m.	“A chunk of input data being programmed into the memory system” (claims 12 and 13)	73
n.	“Comparing the threshold levels of the plurality of cells with the chunk of input data” (claim 13)	74
o.	“Cache memory” (claim 14)	76
B.	Infringement	78
1.	Claim 1	79
a.	Preamble	79
b.	First Limitation	81
c.	Second Limitation	82
(1)	ST NAND	82
(2)	ST NOR	86
d.	Third Limitation	89

	e.	Fourth Limitation	91	
	f.	Conclusion	92	
2.		Claim 3	92	
3.		Claim 5	93	
4.		Claim 6	93	
5.		Claim 7	95	
6.		Claim 8	95	
7.		Claim 10	96	
8.		Claim 12	97	
9.		Claim 13	99	
10.		Claim 14	100	
11.		Indirect Infringement	101	
	a.	Induced Infringement	101	
	b.	Contributory Infringement	105	
C.		Domestic Industry	108	
	1.	Technical Prong	108	
		a.	Claim 1	109
		b.	Dependent Claims	113
	2.	Economic Prong	114	
D.		Validity	114	
	1.	Ordinary Skill in the Art	114	
	2.	Anticipation	115	

a.	GB ‘145	115
b.	The ‘179 Patent	117
c.	M293	120
3.	Obviousness	121
a.	JP100	123
b.	JP100 and the ‘179 Patent	127
c.	JP100 and the ‘344 patent	131
d.	JP100 and the ‘871 patent	134
e.	JP 100 and the ‘541 patent	136
f.	Secondary Considerations	137
4.	Lack of Enablement/Inadequate Written Description/Best Mode	141
E.	Unenforceability	141
	CONCLUSIONS OF LAW	142
	INITIAL DETERMINATION	144
	RECOMMENDED DETERMINATION ON REMEDY AND BOND	146
VI.	Remedy and Bonding	146
A.	Limited Exclusion Order	146
B.	Downstream Products	147
1.	Factor 1: The value of the infringing articles compared to the value of the downstream products in which they are incorporated	149
2.	Factor 2: The identity of the manufacturer of the downstream products (<i>i.e.</i> , are the downstream products manufactured by the party found to have committed the unfair act, or by third parties)	150

3.	Factor 3: The incremental value to the complainant for excluding the downstream products	151
4.	Factor 4: The incremental detriment to respondents if the products are excluded	152
5.	Factor 5: The burden borne by third parties as a result of excluding downstream products	154
6.	Factor 6: The availability of alternative downstream products that do not contain the infringing articles	154
7.	Factor 7: The likelihood that the downstream products actually contain the infringing article and, thus, are subject to the exclusion order	155
8.	Factor 8: The opportunity for evasion of an exclusion order	156
9.	Factor 9: The enforceability of an order by Customs	157
10.	Conclusion	158
C.	Cease and Desist Order	159
D.	Bond During Presidential Review Period	159
APPENDIX OF EXHIBIT LISTS		A1

LIST OF ABBREVIATIONS

CDX	Complainant's demonstrative exhibit
CFF	Complainant's proposed findings of fact
CIB	Complainant's initial post-hearing brief
CORFF	Complainant's objections to Respondents' proposed findings of fact
COSFF	Complainant's objections to Staff's proposed findings of fact
CPX	Complainant's physical exhibit
CRB	Complainant's reply post-hearing brief
CX	Complainant's exhibit
Dep	Deposition
JX	Joint Exhibit
RDX	Respondents' demonstrative exhibit
RFF	Respondents' proposed findings of fact
RIB	Respondents' initial post-hearing brief
ROCF	Respondents' objections to Complainant's proposed findings of fact
ROSFF	Respondents' objections to Staff's proposed findings of fact
RPX	Respondents' physical exhibit
RRB	Respondents' reply post-hearing brief
RX	Respondents' exhibit
SFF	Staff's proposed findings of fact
SIB	Staff's initial post-hearing brief
SOCFF	Staff's objections to Complainant's proposed findings of fact
SORFF	Staff's objections to Respondents' proposed findings of fact
SRB	Staff's reply post-hearing brief
Tr.	Transcript

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

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**CERTAIN NOR AND NAND FLASH MEMORY
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Inv. No. 337-TA-560

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

Administrative Law Judge Charles E. Bullock

(June 1, 2007)

Pursuant to the Notice of Investigation¹ and Rule 210.42(a) of the Rules of Practice and Procedure of the United States International Trade Commission, this is the Administrative Law Judge's Initial Determination in the matter of Certain NOR and NAND flash memory devices and products containing same, Investigation No. 337-TA-560.

The Administrative Law Judge hereby determines that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 and has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 8, 9, 11,

¹ 70 Fed. Reg. 61,841 (October 26, 2005).

27, 28, 32, 50, 51, and 64 of U.S. Patent No. 5,172,338. Furthermore, the Administrative Law Judge hereby determines that a domestic industry in the United States exists that practices U.S. Patent No. 5,991,517 and does not exist that practices U.S. Patent No. 5,172,338.

DISCUSSION

I. Introduction

A. Procedural History

1. Prior Investigations

a. Inv. No. 337-TA-382

The '338 patent has been asserted in two prior Section 337 investigations. The first was Inv. No. 337-TA-382, *Certain Flash Memory Circuits and Products Containing Same* (“the 382 investigation” or “*Certain Flash Memory Circuits*”), which involved SanDisk and Respondents Samsung Electric Company, Ltd. and Samsung Semiconductor, Inc. (collectively “Samsung”), and was before ALJ Harris. In the '382 investigation, ALJ Harris found that Samsung infringed claim 27 of the '338 patent and that SanDisk met the technical prong of domestic industry. The Commission did not review ALJ Harris’ determination on these issues. The case eventually settled.

b. Inv. No. 337-TA-526

The second investigation involving the '338 patent was Inv. No. 337-TA-526, *Certain NAND Flash Memory Circuits and Products Containing Same* (“the 526 investigation” or “*Certain NAND Flash Memory Circuits*”), which involved SanDisk and ST, and was before ALJ Luckern. In the '526 investigation, ALJ Luckern found that ST’s NAND products did not infringe claims 27, 28, or 32 of the '338 patent and that SanDisk’s NAND products did not meet the technical prong of domestic industry. The Commission affirmed ALJ Luckern’s findings on these issues. The Federal Circuit affirmed the Commission’s decision without a published opinion on March 6, 2007.²

² See *SanDisk Corp. v. Int’l Trade Comm’n*, Docket No. 06-1187 (Fed. Cir., Mar. 6, 2007) (affirmed per Rule 36 without published opinion) (“*SanDisk*”).

2. Current Investigation

On January 10, 2006, Complainant SanDisk Corporation (“SanDisk”) filed a complaint with the Commission pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337. The complaint was supplemented on January 24, 2006. The complaint, as supplemented, asserts unfair methods of competition and unfair acts in violation of Section 337 by Respondents STMicroelectronics N.V., and STMicroelectronics, Inc. (“collectively ST”) in connection with the importation, sale for importation, and sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same.

The complaint accuses ST’s products of infringing various claims of the following three U.S. Patents owned by SanDisk: claims 27, 28, 32, 50, 51, and 64 of U.S. Patent No. 5,172,338 (“the ‘338 patent”); claims 1-8 and 10-14 of U.S. Patent No. 5,991,517 (“the ‘517 patent”); and claims 7 and 10 of U.S. Patent No. 6,542,956 (“the ‘956 patent”). The complaint further alleges that there exists a domestic industry with respect to the patents-at-issue. SanDisk seeks, among other things, a limited exclusion order of the infringing NOR and NAND flash memory devices and products containing same, including all downstream products containing the accused ST chips. On February 8, 2006, the Commission issued a notice of investigation that was subsequently published in the Federal Register on February 13, 2006.³ On February 14, 2006, the undersigned set a fourteen-month target date for the investigation, or April 13, 2007.⁴ ST filed a response to the complaint and notice of investigation on March 6, 2006, which was subsequently amended on June 5, 2006 and September 28, 2006.

³ See Notice of Investigation, 71 Fed. Reg. 7576 (February 13, 2006).

⁴ See Order No. 2 (February 14, 2006).

On April 13, 2006, SanDisk filed a motion for leave to amend the Complaint and Notice of Investigation, which was granted by initial determination in Order No. 4, issued on April 25, 2006. On May 17, 2006, the Commission issued a notice not to review the initial determination. Specifically, SanDisk moved to assert three additional claims from the '338 patent (claims 8, 9, and 11), one additional claim from the '956 patent (claim 11), and to accuse ST's NAND flash memory devices of infringing claims 3 and 5 of the '517 patent.

On March 31, 2006, ST filed a motion to terminate the investigation as to the '338 patent based on SanDisk having no domestic industry in the '338 patent, largely based on issue preclusion from the '526 investigation. On May 1, 2006, the undersigned denied the motion to terminate in Order No. 5. On May 8, 2006, ST filed a motion for leave to appeal Order No. 5, which was denied by Order No. 7, issued on May 22, 2006.

On May 17, 2006, SanDisk filed a motion for partial termination of the investigation with respect to the '956 patent, which was granted by initial determination in Order No. 8, issued on June 1, 2006. On June 19, 2006, the Commission issued a notice not to review the initial determination.

On May 15, 2006, the Commission Investigative Staff ("Staff") filed a motion to amend the notice of investigation, which was denied in Order No. 9, issued on June 1, 2006. Specifically, Staff moved to amend the notice of investigation to make the case caption (which read "Certain NOR and NAND Flash Memory Devices and Products Containing Same) consistent with the body of the notice, which failed to include the "products containing same" language. The undersigned ruled that, while it was understandable that the omission of the standard "products containing same" language may have been an inadvertent error, good cause did not exist to amend the notice of investigation at that time, which was more than four months after the notice of investigation had been issued,

because of the potential prejudice to the public interest (including non-parties to the investigation), and parties to the investigation.

On June 7, 2006, Staff filed a motion for reconsideration of Order No. 9, or in the alternative, for leave to seek interlocutory review, which was denied in Order No. 14, issued on July 6, 2006. On June 8, 2006, SanDisk filed a motion for reconsideration, or in the alternative, clarification of Order No. 9, which was granted in part by Order No. 14. On June 15, 2006, SanDisk filed a motion for leave to amend the complaint to remove any ambiguity regarding the scope of the remedy sought by SanDisk (which includes a remedy against third party downstream products that incorporate the infringing ST chips), which was denied by Order No. 14.

In Order No. 14, the undersigned clarified certain aspects of Order No. 9, including (1) that the language in the body of the notice of investigation defines the parameters of the scope of the investigation, not the case caption, and (2) that ST's downstream products are not within the scope of the investigation. In that order, the undersigned clarified that the purpose of the notice of investigation differs from the complaint. Specifically, the notice of investigation determines the scope of the investigation, while the complaint serves as a notice function, detailing the specific claims on which a complainant is relying. The undersigned noted that the Commission has the authority to institute an investigation that covers downstream products, regardless of whether a complainant requests such relief in the complaint. But, the complaint is what puts the other parties on notice that complainant intends to assert narrower relief. The undersigned determined that, in the case where the scope of the notice of investigation is narrower than the relief sought in the complaint, the notice of investigation must govern.

On July 24, 2006, the Commission, *sua sponte*, issued a "Notice of Correction" regarding

the notice of investigation, adding the “and products containing same” language to the body of the notice. The notice also stated that the Commission “expects that the administrative law judge will extend the target date for completion of the investigation to the extent necessary to avoid any prejudice to the parties.” On August 15, 2006, the undersigned issued Order No. 18, an initial determination granting SanDisk’s renewed second motion for leave to amend the complaint based on the Commission’s notice of correction, and to extend the target date by four months. On September 26, 2006, the Commission issued a notice not to review the initial determination.

On July 27, 2006, SanDisk filed a motion to request judicial enforcement of subpoena to Intel Corporation (“Intel”). According to SanDisk, it served a subpoena on Intel requesting discovery on the design and operation of Intel’s licensed flash memory products and on Intel’s related expenditures in the United States, which was essential to SanDisk’s claim of a domestic industry in the ‘338 patent because SanDisk’s claim of domestic industry relies solely on Intel’s practice of the ‘338 patent and that the information could only be obtained from Intel. On August 15, 2006, the undersigned issued Order No. 21, which denied the motion. The undersigned ruled that

This is not the usual type of request for judicial enforcement of a subpoena because it involves information essential to proving Complainant’s own domestic industry based on a licensing agreement with a third-party for a patent that has already been adjudicated at the Commission. While the undersigned finds that Complainant otherwise could have made a proper showing of purpose, relevance and reasonableness, that there are other considerations that warrant against certifying the judicial enforcement request to the Commission.

First, the undersigned does not find that this is a situation where a third-party receives a subpoena and simply ignores it, believing that the Commission’s subpoenas are rarely enforced so that there is little incentive for them to produce relevant information in response to a Commission subpoena. Based on the pleadings filed by Intel, Intel asserts that it has already turned over 7,000 pages of circuit schematic diagrams as well as several thousand more pages of design guides and internal architecture specifications detailing the structure and operation of Intel’s products. The fact that such documents were produced in what SanDisk considers to

be an “inconvenient format and are difficult and time-consuming to analyze” should not be held against Intel. Perhaps if SanDisk would have requested such information from Intel before it filed the complaint, SanDisk would have had more time to analyze the documents without any time constraints and more fully evaluate whether Intel’s NOR flash memory products practice the ‘338 patent.

Second, the undersigned finds it troubling that Complainant did not have the requisite information needed to meet its burden of proof on domestic industry before filing the complaint or that it cannot obtain this information from Intel based on its already existing business/license relationship. This is somewhat surprising given Complainant’s history of already having adjudicated the ‘338 patent here at the Commission. The undersigned finds it disturbing that SanDisk did not even approach Intel prior to filing the complaint in an attempt to ascertain whether Intel’s NOR flash memory products practice the ‘338 patent, especially since it appears that SanDisk is relying on the doctrine of equivalents for certain claim limitations. Complainant had complete control of the timing of filing the complaint and it could have waited to file the complaint after it received information from Intel in order to have a good faith basis to assert a domestic industry in the ‘338 patent.⁵

On August 28, 2006, SanDisk filed a motion for reconsideration of Order No. 21 with respect to the economic prong of the domestic industry requirement. On September 15, 2006, the undersigned issued Order No. 26, denying the motion. The undersigned ruled that

In general, requests for reconsideration “must be confined to new questions raised by the contested determination or the action to be taken thereunder—*questions upon which the moving party had no previous opportunity to submit arguments.*” SanDisk had the opportunity to clearly raise the issue of economic prong documents in its original motion for judicial enforcement. While it is clear that the subpoena covers issues related to both the technical and economic prong of domestic industry, the moving papers focused exclusively on technical prong (with a few conclusory statements regarding economic prong), so the undersigned’s order naturally focused on technical prong as well, even though the order was not limited to technical prong and was written in terms of “domestic industry” in general. Accordingly, the undersigned finds that no new questions have been raised since the undersigned’s ruling in Order No. 21 because SanDisk had the opportunity to present its arguments regarding economic prong documents at the time of its original motion for judicial enforcement, and that because it did not do so, no new questions have been raised.

Furthermore, the undersigned recognizes that there is no requirement under

⁵ See Order No. 21 (August 15, 2006) (footnotes omitted).

Section 337 that a patent holder, who is relying on domestic industry based on the operations of a licensee, must consult with and obtain the cooperation of that licensee before requesting institution of a Section 337 investigation. The undersigned did not base his ruling in Order No. 21 solely because SanDisk did not consult with Intel before filing the complaint. Rather, all the facts and circumstances were considered and the fact that SanDisk did not consult with Intel before the complaint was filed was merely one of the factors that the undersigned considered, which weighed against judicial enforcement. The undersigned's intention in noting that SanDisk's failure to consult with Intel as a factor against judicial enforcement was that SanDisk, as the complainant in this investigation who had already litigated the '338 patent at the Commission twice before, was that a complainant who has the burden of proof with regards to domestic industry should have a good faith basis for establishing that such industry exists before the complaint is filed and that informing a licensee before a case is filed could be beneficial.⁶

On September 12, 2006, SanDisk filed a motion for partial termination of the investigation with respect to claims 1, 2, and 4 of the '517 patent. On October 10, 2006, the undersigned filed Order No. 30, an initial determination granting the motion in part. The undersigned granted the motion with respect to claims 2 and 4, but denied the motion with respect to claim 1. On October 27, 2006, the Commission issued a notice not to review the initial determination.

On September 25, 2006, SanDisk filed a motion for summary determination on the economic prong of the domestic industry requirement in the '517 patent. On November 17, 2006, the undersigned issued Order No. 37, an initial determination granting the motion. On December 8, 2006, the Commission issued a notice not to review the initial determination.

On September 25, 2006, ST filed a motion for summary determination of non-infringement with respect to ST's SLC NOR, 1G F70 NAND, [] and [] products.

On November 17, 2006, the undersigned issued Order No. 38, an initial determination granting in part ST's motion. Specifically, the undersigned determined that there was no infringement with

⁶ See Order No. 26 (September 15, 2006) (footnotes omitted).

respect to ST's SLC NOR products. As to ST's 1G F70 NAND,[] and [] products, the undersigned made no determination regarding infringement, but terminated those products from the investigation and ruled that those products would not be covered by an exclusion order, if applicable.

The parties have stipulated as to certain material facts.⁷ Particular stipulated facts that are relevant to this Initial Determination are cited accordingly.

An evidentiary hearing on liability was conducted before the undersigned from December 4-15, 2006. In support of its case-in-chief and rebuttal case, SanDisk called the following witnesses:

- Mr. Eli Harari (chairman and CEO of SanDisk),⁸
- Sanjay Mehrotra (president of SanDisk);⁹
- Dr. Khandker Quader (VP for memory design at SanDisk);¹⁰
- Gerald Parsons, Esq. (SanDisk's patent prosecution attorney);¹¹
- Brian Napper (SanDisk's domestic industry expert);¹²
- Sakhawat Khan (SanDisk's expert);¹³
- V. Thomas Rhyne (SanDisk's expert);¹⁴ and
- Dr. G. R. Mohan Rao (SanDisk's expert).¹⁵

⁷ See JX-138, JX-139C, and JX-148.

⁸ CX-2225C (Harari Direct); CX-2294C (Harari Rebuttal).

⁹ CX-2226C (Mehrotra Direct); CX-2295C (Mehrotra Rebuttal).

¹⁰ CX-2227C (Quader Direct).

¹¹ CX-2232C (Parsons Direct).

¹² CX-2234C (Napper Direct); CX-2296C (Napper Rebuttal).

¹³ CX-2230C (Khan Direct).

¹⁴ CX-2229C (Rhyne Direct); CX-2324C (Rhyne Supplemental Direct); CX-2298C (Rhyne Rebuttal).

¹⁵ CX-2235C (Rao Direct).

In support of its case-in-chief and rebuttal case, ST called the following witnesses:

- Dr. Vivek Subramanian (ST's expert);¹⁶
- Giulio Casagrande (ST's group VP & director of R&D in the memory products group);¹⁷
- Corrado Villa (ST design director of the wireless flash division of the memory products group);¹⁸
- Mauro Sali (ST product design director);¹⁹
- Richard Pashley (ST's claim construction expert);²⁰
- Carla Mulhern (ST's remedy and bonding expert);²¹ and
- Martin Adelman (ST's patent procedures expert).²²

In addition, various deposition testimony was received into evidence in lieu of direct witness statements or live testimony.

After the hearing, post-hearing briefs and reply briefs, together with proposed findings of fact, conclusions of law and rebuttals to the same, were filed on January 8, 2007 and January 19, 2007, respectively.

On January 16, 2007, the undersigned issued Order No. 43, an initial determination extending the target date of the investigation by one and a half months, to October 1, 2007. The Commission did not review this Initial Determination.

¹⁶ RX-1801C (Subramanian Direct); RX-2153C (Subramanian Rebuttal).

¹⁷ RX-1804C (Casagrande Direct).

¹⁸ RX-2155C (Villa Rebuttal).

¹⁹ RX-2156C (Sali Rebuttal).

²⁰ RX-1802C (Pashley Direct).

²¹ RX-1800C (Mulhern Direct); RX-2154C (Mulhern Rebuttal).

²² RX-1803C (Adelman Direct).

B. The Parties

1. Complainant

Complainant SanDisk Corporation (“SanDisk”) is a Delaware corporation with its headquarters in Milpitas, California. Prior to 1995, SanDisk was known as “SunDisk Corporation.”

2. Respondents

Respondent STMicroelectronics N.V. is a Netherlands corporation with its principal place of business in Geneva, Switzerland. Respondent STMicroelectronics, Inc. is a Delaware corporation with its principal place of business in Carrollton, Texas. Prior to 1998, ST was known as SGS-Thompson Microelectronics.

C. Overview of the Technology

At issue in this investigation are certain NOR and NAND flash memory devices and products containing same. Both the ‘517 and ‘338 patents relate to improving the performance and accuracy of flash memory devices and systems. “EEPROM” stands for “electrically erasable programmable read-only memory,” which is a type of non-volatile memory chip(s). Non-volatile memory chips include memory cells that contain a structure (*e.g.*, a floating gate) that retains its data content even when power is removed from the memory chip. Memory that retains information when power is removed is useful in many applications, including computer systems.

An EEPROM includes a source, a drain, a gate (called a “control” gate), a floating gate, and a substrate. If the memory cell stores more than one bit of information (“11”, “10”, “01” or “00”), the EEPROM is called a multi-level cell (MLC) device. The basic unit of memory in a flash EEPROM device is referred as a “cell.” Memory cells are based on a type of transistor – the metal oxide semiconductor field effect transistor (“MOSFET”). EEPROM cells consist of a MOSFET

with an additional “floating” gate between the control gate and the substrate for storing one or more bits of information. One method of placing electrons on a floating gate is called Hot Electron Injection (“HEI”). A cell undergoing HEI has its source grounded to 0 volts and the voltage at its drain terminal and its control gate raised to a high voltage. Another method for placing electrons on a floating gate is Fowler-Nordheim Tunneling.

In flash EEPROM devices, memory cells are arranged into rows, connected with wordlines and columns, connected via bit lines, which together form an array. Two of the most common EEPROM array architectures are NAND and NOR architectures. In a NAND EEPROM array, all cells in a column are linked together in what is referred to as a “NAND string.” In a NAND string, access to a given cell in a column goes through the other cells in the NAND string. In a NOR architecture, each memory cell is at the intersection of a wordline and a bitline.

D. The Patents at Issue

1. The ‘338 Patent

The ‘338 patent is entitled “Multi-state EEPROM read and write circuits and techniques” which was issued on December 15, 1992, based on Application Serial No. 508,273, filed on April 11, 1990. The named inventors are Sanjah Mehrotra and Eliyahou Harari,²³ and the patent was assigned to the SunDisk Corporation. SanDisk is the current owner of the ‘338 patent by assignment. On July 8, 1997, a reexamination certificate was issued, along with a certificate of correction. The ‘338 patent has a total of 65 claims.²⁴ Three independent claims, claims 8, 27, and

²³ Note that Winston Lee is noted as an inventor, but a Certificate of Correction, issued on November 2, 1993, deleted him as a named inventor.

²⁴ The ‘338 patent was reexamined, where it was determined that the patentability of claims 1-31, 35-43, and 45-47 is confirmed, claims 32 and 44 were determined to be patentable as amended, (continued...)

32 are at issue here. Dependent claims 9, 11, 28, 50, 51, and 64 are also at issue here.²⁵

2. The '517 Patent

The '517 patent is entitled "Flash EEPROM system with cell by cell programming verification" which was issued on November 23, 1999, based on Application Serial No. 08/771,708, filed on December 20, 1996. The named inventors are Eliyahou Harari, Robert D. Norman, and Sanjay Mehrotra, and the patent was assigned to SanDisk Corporation, the current owner of the '517 patent. The '517 patent has a total of 39 claims. One independent claim, claim 1 is at issue here. Dependent claims 3, 5-8, and 10-14 are also at issue here.²⁶

E. The Products at Issue

1. SanDisk's Products

SanDisk is in the semiconductor and consumer electronics business. SanDisk produces NAND flash components, as well as controllers, and packages them into products such as flash memory cards, MP3 players, and USB flash drives. SanDisk asserts that its [] flash memory satisfies the technical prong of the domestic industry requirement for the '517 patent.

²⁴(...continued)

claims 33 and 34, dependent on an amended claim, were determined to be patentable, while claims 48-65 were added and determined to be patentable.

²⁵ See CX-98/RX-1 ("the '338 patent"); CX-100/RX-3 ("the '338 prosecution history"); CX-102/RX-5 ("the '338 reexamination").

The undersigned notes that the Ground Rules specifically provide that parties are supposed to exchange exhibit lists with each other prior to date exhibits are to be exchanged to eliminate any duplicate exhibits or renumber the exhibits as joint exhibits. See Ground Rule 9.4.1. The undersigned can find no reason why the parties should not be able to agree to have the patents at issue, along with their corresponding prosecution histories, to be labeled as joint exhibits. Because the parties failed to adhere to this Ground Rule, it makes referencing specific pages in the prosecution history quite burdensome because the parties have put different bates numbers on their own exhibits when referring to the same document. The undersigned has attempted to cross-reference such bates numbers in as many places as possible.

²⁶ See CX-99/RX-2 ("the '517 patent"); CX-103/RX-4 ("the '517 prosecution history").

The parties have agreed that SanDisk's [] is representative of the design of SanDisk's other NAND flash memories including the following chips: [

] ²⁷

SanDisk relies on the following Intel MLC NOR products for domestic industry in the '338 patent: L18/L30 StrataFlash, code named [], K3/K18 StrataFlash, code named [] and J3 StrataFlash, code named []

2. ST's Products

ST produces chips and flash cards, and also sells its products for use in mobile phones, automotive, disc drive, computer, and consumer electronics applications. SanDisk accuses ST's [] MLC NOR chips of infringing claims 8, 9, 27, 28, 32, 50, and 64 of the '338 patent, and claims 1, 3, 5-8, 10, 12-14 of the '517 patent. In addition SanDisk accuses ST's SLC NAND chips, as well as certain versions of the 4G F90 MLC NAND chip, to infringe claims 1, 3, 5-8, 10, and 12 of the '517 patent. The parties have agreed that the design of the [] is representative of the [] and that the operation of the [] is representative of the design of the W8EL.²⁸ Specifically, SanDisk accuses the following ST products as infringing the asserted patents:

- [] MLC NOR flash memory chips: M30L0T7000, M36LLT7760, M25P128, M58LT128G, M58LT256G, M36L0T7040, M36L0R7060, M30L0T8000, M30L0T8800, M30L0T8860, M30L0T8888, M36L0T8060, M36L0R8860, M36LLR8870, M39L0R8070, M36LNR8860, M36L0R8050, M36L0R8060, M36L0T8050, M36L0T7060, M30L0R7000, M58LR128G, M58WR128FU, M36L0R7040, M36L0R7050, M30L0R8000, M58LR256GU, M30L0R8800,

²⁷ JX-139C (Stipulation Regarding Representative Products) at 3.

²⁸ JX-139C (Stipulation) at ¶¶ 2-4.

M39LLR8870, M36LLR8860, M39L0R8870, M36L0R8870, M36LLR8760, M36L0R8070, M39P0R8070, M39P0R8060, M36L0P8060, M36P0R8060;

● [] MLC NOR flash memory chips: M39P0R9970, M39L0R9070, M39P0R9070, M36P0R9070, M39P0R9080, M36P0R9080, M36P0R9060; and

● NAND flash memory chips: 512 Mb F12 NAND, 256 Mb F12 NAND, 128 Mb F90 NAND, 256 Mb F90 NAND, 512 Mb F90 NAND (Small Page), 512 Mb F90 NAND (Large Page), 1 Gb F90 NAND, 2 Gb F90 NAND, 4 Gb F90 MLC NAND, 2 Gb F70 NAND, and 4 Gb F70 NAND.

II. Jurisdiction and Importation

Section 337 confers subject matter jurisdiction on the International Trade Commission to investigate, and if appropriate, to provide a remedy for, unfair acts and unfair methods of competition in the importation of articles into the United States. In order to have the power to decide a case, a court or agency must have both subject matter jurisdiction, and jurisdiction over either the parties or the property involved.²⁹

A. Subject Matter Jurisdiction

The complaint alleges that ST has violated Subsection 337(a)(1)(A) and (B) in the importation and sale of products that infringe the asserted patents. ST has admitted that it has imported millions of dollars of accused products into the United States and that it has [

] accused chips in inventory in the United States.³⁰ Accordingly, the Commission has subject matter jurisdiction over ST in this investigation.³¹

²⁹ 19 U.S.C. § 1337; also see *Certain Steel Rod Treating Apparatus and Components Thereof*, Inv. No. 337-TA-97, Commission Memorandum Opinion, 215 U.S.P.Q. 229, 231 (1981) (“*Certain Steel Rod*”).

³⁰ ST’s Response to Second Amended Complaint at 1; JX-135C (ST’s Interrogatory Responses) at 9-11; CX-1871C (Americas Inventory); CX-2234C (Napper Direct) at 67-68.

³¹ See *Amgen, Inc. v. U.S. Int’l Trade Comm’n*, 902 F.2d 1532, 1536 (Fed. Cir. 1990) (“*Amgen*”).

B. Personal Jurisdiction

ST has responded to the complaint and notice of investigation, participated in the investigation, including participating in discovery, made an appearance at the hearing, and submitted post-hearing briefs, thereby submitting to the personal jurisdiction of the Commission.³²

III. Relevant Law

A. Claim Construction

Analyzing whether a patent is infringed “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 or process accused of infringing.”³³ The first step is a question of law, whereas the second step is a factual determination.³⁴ Concerning the first step of claim construction, “[i]t is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.”³⁵

“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

³² See *Certain Miniature Hacksaws*, Inv. No. 337-TA-237, U.S.I.T.C. Pub. No. 1948, Initial Determination (unreviewed by Commission in relevant part) at 4, 1986 WL 379287 (U.S.I.T.C., October 15, 1986) (“*Certain Miniature Hacksaws*”).

³³ *Dow Chem. Co. v. United States*, 226 F.3d 1334, 1338 (Fed. Cir. 2000) (“*Dow Chemical*”), citing *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*), *aff’d*, 517 U.S. 370 (1996) (“*Markman*”).

³⁴ *Markman*, *supra*.

³⁵ *Bell Atlantic Network Serv., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001) (“*Bell Atlantic*”). See also *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-17 (Fed. Cir. 2005) (“*Phillips*”), *cert. denied*, 126 S.Ct. 1332.

[] out and distinctly claim [] the subject matter which the patentee regards as his invention.”³⁶

“Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claim terms.”³⁷ Usage of a term in both the asserted and unasserted claims is “highly instructive” in determining the meaning of the same term in other claims.³⁸ “Furthermore, a claim term should be construed consistently with its appearance in other places in the same claim or in other claims of the same patent.”³⁹

“While not an absolute rule, all claim terms are presumed to have meaning in a claim.”⁴⁰ If the claim language is not clear on its face, “[t]hen we look to the rest of the intrinsic evidence, beginning with the specification and concluding with the prosecution history, if in evidence” for the purpose of “resolving, if possible, the lack of clarity.”⁴¹

There is a “heavy presumption” that claim terms are to be given “their ordinary and accustomed meaning as understood by one of ordinary skill in the art,” and in aid of this interpretation, “[d]ictionaries and technical treatises, which are extrinsic evidence, hold a ‘special place’ and may sometimes be considered along with the intrinsic evidence when determining the ordinary meaning of claim terms.”⁴² Caution must be used, however, when referring to non-

³⁶ *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“*Interactive Gift Express*”), citing 35 U.S.C. § 112, ¶ 2.

³⁷ *Phillips*, 415 F.3d at 1314 citing *Vitronics Corp. v. Conceptronic Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 2003) (“*Vitronics*”).

³⁸ *Id.*

³⁹ *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001) (“*Rexnord*”) citing *Phonometrics Inc. v. Northern Telecom Inc.*, 133 F.3d 1459, 1465 (Fed. Cir. 1998) (“*Phonometrics*”).

⁴⁰ *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004) (“*Innova*”).

⁴¹ *Id.*

⁴² *Bell Atlantic*, 262 F.3d at 1267-68.

scientific dictionaries “lest dictionary definitions . . . be converted into technical terms of art having legal, not linguistic significance.”⁴³

The presumption in favor of according a claim term its ordinary meaning is overcome “(1) where the patentee has chosen to be his own lexicographer, or (2) where a claim term deprives the claim of clarity such that there is ‘no means by which the scope of the claim may be ascertained from the language used.’”⁴⁴ In this regard, “[t]he specification acts as a dictionary ‘when it expressly defines terms used in the claims or when it defines terms by implication.’”⁴⁵

The specification is considered “always highly relevant” to claim construction and “[u]sually, it is dispositive; it is the single best guide to the meaning of a disputed term.”⁴⁶ The prosecution history is also examined for a claim’s scope and meaning “to determine whether the patentee has relinquished a potential claim construction in an amendment to the claim or in an argument to overcome or distinguish a reference.”⁴⁷

“[I]f the meaning of the claim limitation is apparent from the intrinsic evidence alone, it is improper to rely on extrinsic evidence other than that used to ascertain the ordinary meaning of the claim limitation. [citation omitted] However, in the rare circumstance that the court is unable to determine the meaning of the asserted claims after assessing the intrinsic evidence, it may look to additional evidence that is extrinsic to the complete document record to help resolve any lack of clarity.”⁴⁸

⁴³ *Id.* at 1267 (internal quotation marks omitted).

⁴⁴ *Id.* at 1268.

⁴⁵ *Id.* See also *Phillips*, 415 F.3d at 1316.

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.* at 1268-69.

“Extrinsic evidence consists of all evidence external to the patent and prosecution history”⁴⁹ It includes “such evidence as expert testimony, articles, and inventor testimony.”⁵⁰ But, “[i]f the intrinsic evidence resolves any ambiguity in a disputed claim, extrinsic evidence cannot be used to contradict the established meaning of the claim language.”⁵¹ “What is disapproved of is an attempt to use extrinsic evidence to arrive at a claim construction that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.”⁵²

In interpreting particular limitations within each claim, “adding limitations to claims not required by the claim terms themselves, or unambiguously required by the specification or prosecution history, is impermissible.”⁵³ Usually, a patent is not limited to its preferred embodiments in the face of evidence of broader coverage by the claims.⁵⁴ A claim construction that excludes the preferred embodiment in the specification of a patent, however, is “rarely, if ever, correct.”⁵⁵

On the other hand, “there is sometimes ‘a fine line between reading a claim in light of the

⁴⁹ *Markman*, 52 F.3d at 980.

⁵⁰ *Bell Atlantic*, 262 F.3d at 1269.

⁵¹ *DeMarini Sports, Inc. v. Worth, Inc.*, 239 F.3d 1314, 1322-23 (Fed. Cir. 2001) (“*DeMarini*”).

⁵² *Markman*, 52 F.3d at 979.

⁵³ *Dayco Prod., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 1327 (Fed. Cir. 2001) (“*Dayco Products*”), citing *Laitram Corp. v. NEC Corp.*, 163 F.3d 1342, 1347 (Fed. Cir. 1998) (“*Laitram*”) (“a court may not import limitations from the written description into the claims”).

⁵⁴ *Acromed Corp. v. Sofamor Danek Group, Inc.*, 253 F.3d 1371, 1382-83 (Fed. Cir. 2001) (“*Acromed*”); *Electro Med. Sys. S.A. v. Cooper Life Sci., Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994) (“*Electro Med*”) (“particular embodiments appearing in a specification will not be read into the claims when the claim language is broader than such embodiments”).

⁵⁵ *Vitronics*, 90 F.3d at 1583-34.

specification, and reading a limitation into the claim from the specification.”⁵⁶ In order to negotiate this “fine line,” one guideline is that features of embodiments in the specification do not restrict patent claims “unless the patentee has demonstrated a clear intention to limit the claim scope using ‘words or expressions of manifest exclusion or restriction.’”⁵⁷ Another guideline is that features of an embodiment in the specification do not restrict claims unless the specification defines the claim terms “by implication” as may be “found in or ascertained by a reading of the patent documents.”⁵⁸ For the specification to limit the claims, there must be “a clear case of the disclaimer of subject matter that, absent the disclaimer, could have been considered to fall within the scope of the claim language.”⁵⁹

Claims amenable to more than one construction should, when it is reasonably possible to do so, be construed to preserve their validity.⁶⁰ A claim cannot, however, be construed contrary to its plain language.⁶¹ Claims cannot be judicially rewritten in order to fulfill the axiom of preserving

⁵⁶ *Bell Atlantic*, 262 F.3d at 1270.

⁵⁷ *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (“*Liebel-Flarsheim I*”).

⁵⁸ *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004) (“*Irdeto*”).

⁵⁹ *Liebel-Flarsheim I*, 358 F.3d at 907. The Federal Circuit “has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment.” *Liebel-Flarsheim I*, *supra*, 358 F.3d at 906 (emphasis added); also see, e.g., *Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1331 (Fed. Cir. 2004) (“*Golight*”); *Bio-Technology General Corp. v. Duramed Pharmaceuticals, Inc.*, 325 F.3d 1356, 1362 (Fed. Cir. 2003) (“*Bio-Technology*”) (aspects of only embodiment described in specification not read into claims). The *Liebel-Flarsheim I* panel further held that even where a patent describes only a single embodiment, claims will not be “read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using ‘words or expressions of manifest exclusion or restriction.’” *Id.*

⁶⁰ *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1384 (Fed. Cir. 2001) (“*Karsten*”).

⁶¹ See *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999) (“*Rhine*”).

their validity; “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.”⁶²

Pursuant to 35 U.S.C. § 112, ¶ 6, “[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” An applicant may therefore “claim an element of a combination functionally, without reciting structures for performing those functions.”⁶³ To invoke this rule, “a claim limitation that actually uses the word ‘means’ will invoke a rebuttable presumption that § 112 ¶ 6 applies. By contrast, a claim term that does not use ‘means’ will trigger the rebuttable presumption that § 112 ¶ 6 does not apply.”⁶⁴ In general, the words “circuit” and “circuitry” connote sufficient structure in and of themselves so as not to be deemed as “means-plus-function” elements.⁶⁵

B. Infringement

1. Literal Infringement

Literal infringement is a question of fact.⁶⁶ Literal infringement requires the patentee to prove that the accused device contains each limitation of the asserted claim(s). Each element of a

⁶² *Id.*

⁶³ *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1371 (Fed. Cir.), *cert. denied*, 540 U.S. 1073 (2003) (“*Apex*”).

⁶⁴ *Linear Technology Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1319 (Fed. Cir. 2004) (“*Linear*”).

⁶⁵ *See Linear, supra; Apex*, 325 F.3d at 1374.

⁶⁶ *Tegal Corp. v. Tokyo Electron Am., Inc.*, 257 F.3d 1331, 1350 (Fed. Cir. 2001) (“*Tegal*”), *cert. denied*, 535 U.S. 927 (2002).

claim is considered material and essential, and in order to show literal infringement, every element must be found to be present in the accused device.⁶⁷ If any claim limitation is absent from the accused device, there is no literal infringement of that claim as a matter of law.⁶⁸

2. Indirect Infringement

To establish a claim for induced infringement, a complainant must show that a respondent has actively induced a person to make, use, or sell a product or use a method that falls within the scope of the claims of the patent at issue.⁶⁹ The required elements of a claim of induced infringement are: “(1) an act of direct infringement; (2) the accused infringer actively induced a third party to infringe the patent; and (3) the accused infringer knew or should have known that his actions would induce infringement.”⁷⁰

Under 35 U.S.C. § 271(c), a seller of a component of an infringing product can be held liable for contributory infringement if: “(1) there has been an act of direct infringement by a third party; (2) the accused contributory infringer knows that the combination for which its component was made was both patented and infringing; and (3) there are no substantial non-infringing uses for the component part, *i.e.*, the component is not a ‘staple article’ of commerce.”⁷¹

⁶⁷ *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991) (“*London*”).

⁶⁸ *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000) (“*Bayer*”).

⁶⁹ 35 U.S.C. § 271(b).

⁷⁰ *Certain Flash Memory Circuits*, Inv. No. 337-TA-382, U.S.I.T.C. Pub. 3046, Commission Opinion on the Issues Under Review and on Remedy, the Public Interest, and Bonding, at 16, 1997 WL 817778 (U.S.I.T.C., July 1997) citing *Manville Sales Corp. v. Paramount Sys. Inc.*, 917 F.2d 544, 553 (Fed. Cir. 1990) (“*Manville*”). See also *Certain Headboxes and Papermaking Machine Forming Sections for the Continuous Production of Paper, and Components Thereof*, Inv. No. 337-TA-82, USITC Pub. No. 1138 at 18- 19 (1981) (“*Certain Headboxes*”).

⁷¹ *Certain Flash Memory*, Commission Opinion at 9-10.

C. Domestic Industry

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.”⁷² This “domestic industry requirement” has an “economic” prong and a “technical” prong.

The term “domestic industry” in Section 337 is not defined by the statute, but the Commission has interpreted the intent of Section 337 to be “the protection of domestic manufacture of goods.”⁷³ The Commission has further stated that “[t]he scope of the domestic industry in patent-based investigations has been determined on a case by case basis in light of the realities of the marketplace and encompasses not only the manufacturing operations but may include, in addition, distribution, research and development and sales.”⁷⁴

In making this determination, Section 337(a)(2) provides that for investigations based on patent infringement, a violation 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). Section 337(a)(3) sets forth the following economic criteria for determining the existence of a domestic industry in such investigations:

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 . . . concerned –

(A) significant investment in plant and equipment;

⁷² 19 U.S.C. § 1337(a)(2).

⁷³ *Certain Dynamic Random Access Memories, Components Thereof and Products Containing Same*, Inv. No. 337-TA-242, U.S.I.T.C. Pub. No. 2034 (November 1987), Commission Opinion at 61, 1987 WL 450856 (U.S.I.T.C., September 21, 1987) (“*Certain DRAMs*”).

⁷⁴ *Id.* at 62 (footnotes omitted).

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.⁷⁵

As the statute uses the disjunctive term “or,” a complainant can demonstrate this so-called “economic prong” of the domestic industry requirement by satisfying any one of the three tests set forth in Section 337(a)(3).⁷⁶ The complainant bears the burden of establishing that the domestic industry requirement is satisfied.⁷⁷

In addition to meeting the economic criteria of the domestic industry requirement, a complainant in a patent-based Section 337 investigation must also demonstrate that it is practicing or exploiting the patents at issue.⁷⁸ In order to find the existence of a domestic industry exploiting a patent at issue, it is sufficient to show that the domestic industry practices any claim of that patent, not necessarily an asserted claim of that patent.⁷⁹ Fulfillment of this so-called “technical prong” of the domestic industry requirement is not determined by a rigid formula, but rather by the articles of commerce and the realities of the marketplace.⁸⁰

⁷⁵ 19 U.S.C. § 1337(a)(3).

⁷⁶ See *Certain Plastic Encapsulated Integrated Circuits*, Inv. No. 337-TA-315, U.S.I.T.C. Pub. No. 2574 (November 1992), Initial Determination at 83, 1992 WL 813952 (U.S.I.T.C., October 15, 1991) (unreviewed by Commission in relevant part) (“*Certain Encapsulated Circuits*”).

⁷⁷ See *Certain Set-Top Boxes and Components Thereof*, Inv. No. 337-TA-454, U.S.I.T.C. Pub. No. 3564 (November 2002), Initial Determination at 294, 2002 WL 31556392 (U.S.I.T.C., June 21, 2002), *unreviewed by Commission in relevant part*, Commission Opinion at 2 (August 29, 2002) (“*Certain Set-Top Boxes*”).

⁷⁸ See 19 U.S.C. § 1337(a)(2) and (3); also see *Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Commission Opinion at 8, 1996 WL 1056095 (U.S.I.T.C., January 16, 1996) (“*Certain Microsphere Adhesives*”), *aff’d sub nom. Minnesota Mining & Mfg. Co. v. U.S. Int’l Trade Comm’n*, 91 F.3d 171 (Fed. Cir. 1996) (Table); *Certain Encapsulated Circuits*, Commission Opinion at 16.

⁷⁹ *Certain Microsphere Adhesives*, Commission Opinion at 7-16.

⁸⁰ *Certain Diltiazem Hydrochloride and Diltiazem Preparations*, Inv. No. 337-TA-349, (continued...)

The test for claim coverage for the purposes of the technical prong of the domestic industry requirement is the same as that for infringement.⁸¹ “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.”⁸² As with infringement, the first step of claim construction is a question of law, whereas the second step of comparing the article to the claims is a factual determination.⁸³ To prevail, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent either literally or under the doctrine of equivalents.⁸⁴

D. Validity

A patent is presumed valid.⁸⁵ The party challenging a patent’s validity has the burden of overcoming this presumption by clear and convincing evidence.⁸⁶ Since the claims of a patent measure the invention at issue, the claims must be interpreted and given the same meaning for purposes of both validity and infringement analyses. As with an infringement analysis, an analysis of invalidity involves two steps: the claim scope is first determined, and then the properly construed claim is compared with the prior art to determine whether the claimed invention is anticipated and/or

⁸⁰(...continued)

U.S.I.T.C. Pub. No. 2902, Initial Determination at 138, 1995 WL 945191 (U.S.I.T.C., February 1, 1995) (unreviewed in relevant part) (“*Certain Diltiazem*”); *Certain Double-Sided Floppy Disk Drives and Components Thereof*, Inv. No. 337-TA-215, 227 U.S.P.Q. 982, 989 (Commission Opinion 1985) (“*Certain Floppy Disk Drives*”).

⁸¹ *Certain Doxorubicin and Preparations Containing Same*, Inv. No. 337-TA-300, Initial Determination at 109, 1990 WL 710463 (U.S.I.T.C., May 21, 1990) (“*Certain Doxorubicin*”), *aff’d*, Views of the Commission at 22 (October 31, 1990).

⁸² *Id.*

⁸³ *Markman*, 52 F.3d at 976.

⁸⁴ *See Bayer*, 212 F.3d at 1247.

⁸⁵ 35 U.S.C. § 282; *Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1480 (Fed. Cir. 1997) (“*Richardson-Vicks*”).

⁸⁶ *Richardson-Vicks Inc., supra*; *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044 (Fed. Cir.) (“*Uniroyal*”), *cert. denied*, 488 U.S. 825 (1988).

rendered obvious.⁸⁷

1. Anticipation, 35 U.S.C. §§ 102 (a), (b) and (e)

A patent may be found invalid as anticipated under 35 U.S.C. § 102(a) if “the invention was known or used by others in this country, or patented or described in a printed publication in this country, or patented or described in a printed publication in a foreign country, before the invention thereof by the applicant for patent.” 35 U.S.C. § 102(a). A patent may be found invalid as anticipated under 35 U.S.C. § 102(b) if “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.”⁸⁸ Under 35 U.S.C. § 102(e), a patent is invalid as anticipated if “the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent.”⁸⁹ Anticipation is a question of fact.⁹⁰

Under the foregoing statutory provision, a claim is anticipated and therefore invalid when “the four corners of a single, prior art document describe[s] every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation.”⁹¹ To be considered anticipatory, the prior art reference must be enabling and describe the applicant’s claimed invention sufficiently to have placed it in

⁸⁷ *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001) (“*Amazon.com*”).

⁸⁸ 35 U.S.C. § 102(b).

⁸⁹ 35 U.S.C. § 102(e).

⁹⁰ *Texas Instruments, Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1177 (Fed. Cir. 1993) (“*Texas Instruments II*”).

⁹¹ *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000), *cert. denied*, 532 U.S. 904 (2001) (“*Advanced Display Systems*”).

possession of a person of ordinary skill in the field of the invention.⁹² But, the degree of enabling detail contained in the reference does not have to exceed that contained in the patent at issue.⁹³

Further, the disclosure in the prior art reference does not have to be express, but may anticipate by inherency where the inherency would be appreciated by one of ordinary skill in the art.⁹⁴ To be inherent, the feature must necessarily be present in the prior art.⁹⁵ Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient. This modest flexibility in the rule that “anticipation” requires that every element of the claims appear in a single reference accommodates situations where the common knowledge of technologists is not recorded in the reference; that is, where technological facts are known to those in the field of the invention, albeit not known to judges.⁹⁶

2. Obviousness, 35 U.S.C. § 103 (a)

Under 35 U.S.C. § 103(a), a patent is valid unless “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

⁹² *Helifix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000) (“*Helifix*”); *In re Paulsen*, 30 F.3d 1475, 1478 (Fed. Cir. 1994) (“*Paulsen*”).

⁹³ *Paulsen*, 30 F.3d at 1481 n.9.

⁹⁴ *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir.), *cert. denied*, 516 U.S. 988 (1995) (“*Glaxo*”).

⁹⁵ See *Finnigan Corp. v. U.S. Int’l Trade Comm’n*, 180 F.3d 1354, 1365-66 (Fed. Cir. 1999) (“*Finnigan*”).

⁹⁶ See *Cont’l Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268-69 (Fed. Cir. 1991) (“*Continental Can*”); *Finnigan*, 180 F.2d at 1365.

subject matter pertains.”⁹⁷ The ultimate question of obviousness is a question of law, but “it is well understood that there are factual issues underlying the ultimate obviousness decision.”⁹⁸

Once claims have been properly construed, “[t]he second step in an obviousness inquiry is to determine whether the claimed invention would have been obvious as a legal matter, based on underlying factual inquiries including : (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) secondary considerations of non-obviousness” (also known as “objective evidence”).⁹⁹

Although the Federal Circuit case law also required that, in order to prove obviousness, the patent challenger must demonstrate, by clear and convincing evidence, that there is a “teaching, suggestion, or motivation to combine, the Supreme Court has rejected this “rigid approach” employed by the Federal Circuit in *KSR Int’l Co. v. Teleflex Inc.*:¹⁰⁰

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. Sakraida and Anderson’s-Black Rock are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established function.

Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known

⁹⁷ 35 U.S.C. § 103(a).

⁹⁸ *Richardson-Vicks Inc.*, 122 F.3d at 1479; *Wang Lab., Inc. v. Toshiba Corp.*, 993 F.2d 858, 863 (Fed. Cir. 1993) (“*Wang Laboratories*”).

⁹⁹ *Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1354 (Fed. Cir. 1999) (“*Smiths Industries*”), citing *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (“*Graham*”).

¹⁰⁰ *KSR Int’l Co. v. Teleflex Inc.*, 500 U.S. – (2007), 127 S.Ct. 1727, 1739 (“*KSR*”).

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. To facilitate review, this analysis should be made explicitly. See *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusions of obviousness”). 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.

[. . .]

The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advance that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.¹⁰¹

“Secondary considerations,” also referred to as “objective evidence of non-obviousness,” such as “commercial success, long felt but unsolved needs, failure of others, etc.” may be used to understand the origin of the subject matter at issue, and may be relevant as indicia of obviousness or non-obviousness.¹⁰² Secondary considerations may also include copying by others, prior art teaching away, and professional acclaim.¹⁰³

¹⁰¹ *KSR*, 500 U.S. at – ; 127 S.Ct. at 1740-41.

¹⁰² *Graham*, 383 U.S. at 17-18.

¹⁰³ See *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir. 1984) (“*Perkin-Elmer*”), cert. denied, 469 U.S. 857 (1984); *Avia Group Int’l, Inc. v. L.A. Gear California*, 853 F.2d 1557, 1564 (Fed. Cir. 1988) (“*Avia*”) (copying by others); *In re Hedges*, 783 F.2d 1038, 1041 (Fed. Cir. 1986) (“*Hedges*”) (prior art teaching away; invention contrary to accepted wisdom); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565 (Fed. Cir. 1986) (“*Kloster*”), cert. denied, 479 (continued...)

Evidence of “objective indicia of non-obviousness,” also known as “secondary considerations,” must be considered in evaluating the obviousness of a claimed invention, but the existence of such evidence does not control the obviousness determination. A court must consider all of the evidence under the *Graham* factors before reaching a decision on obviousness.¹⁰⁴ In order to accord objective evidence substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention, and a *prima facie* case is generally made out “when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent.”¹⁰⁵ Once the patentee has made a *prima facie* case of nexus, the burden shifts to the challenger to show that the commercial success was caused by “extraneous factors other than the patented invention, such as advertising, superior workmanship, etc.”¹⁰⁶

3. Written Description/Enablement, 35 U.S.C. § 112, ¶ 1

Section 112, ¶ 1 of Title 35 requires that the specification describe the manner and process of making and using the invention “in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.”

¹⁰³(...continued)

U.S. 1034 (1987) (wide acceptance and recognition of the invention).

¹⁰⁴ *Richardson-Vicks Inc.*, 122 F.3d at 1483-84.

¹⁰⁵ *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“GPAC”); *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 956 (1988) (“Demaco”); *Certain Crystalline Cefadroxil Monohydrate*, Inv. No. 337-TA-293, Commission Opinion (March 15, 1990), 15 U.S.P.Q.2d 1263, 1270 (“*Certain Crystalline*”).

¹⁰⁶ *Id.* at 1393.

The issue of whether a disclosure is enabling is a matter of law.¹⁰⁷ “To be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”¹⁰⁸ “Patent protection is granted in return for an enabling disclosure of an invention, not for vague, intimations of general ideas that may or may not be workable.”¹⁰⁹ Although a specification need not disclose minor details that are well known in the art, “[i]t is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement,” and in so doing the specification cannot merely provide “only a starting point, a direction for further research.”¹¹⁰ On the other hand, “[i]t is not fatal if some experimentation is needed, for the patent document is not intended to be a production specification.”¹¹¹ “Undue experimentation” is “a matter of degree” and “not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed”¹¹²

It is well-settled that in order to be enabling under Section 112, “the patent must contain a description sufficient to enable one skilled in the art to make and use the full scope of the claimed

¹⁰⁷ *Applied Materials, Inc. v. Advanced Semiconductor Materials America, Inc.*, 98 F.3d 1563, 1575 (Fed. Cir. 1996) (“*Applied Materials*”).

¹⁰⁸ *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (“*Genentech*”).

¹⁰⁹ *Id.* at 1366.

¹¹⁰ *Id.*

¹¹¹ *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 941 (Fed. Cir. 1990) (“*Northern Telecom*”).

¹¹² *PPG Industries, Inc. v. Guardian Industries Corp.*, 75 F.3d 1558, 1564 (Fed. Cir. 1996) (“*PPG Industries*”).

invention.”¹¹³ Section 112 requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to such persons.¹¹⁴

E. Enforceability

1. Inequitable Conduct

A patent is unenforceable on grounds of “inequitable conduct” if the patentee withheld material information from the PTO with intent to mislead or deceive the PTO into allowing the claims.¹¹⁵ Both materiality and intent must be proven by clear and convincing evidence.¹¹⁶ When inequitable conduct occurs in relation to one or more claims of a patent, the entire patent is unenforceable.¹¹⁷

According to the rules of the PTO, the duty to disclose information “exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim.”¹¹⁸

Generally, when withheld information is highly material, a lower showing of deceptive intent

¹¹³ *United States v. Teletronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988) (“*Teletronics*”); see also *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 1213 (Fed. Cir. 1991) (“*Chugai*”) (inventor’s disclosure must be “sufficient to enable on skilled in the art to carry out the invention commensurate with the scope of his claims”).

¹¹⁴ *Application of Fischer*, 427 F.2d 833, 839 (C.C.P.A. 1970) (“*Fischer*”).

¹¹⁵ *LaBounty Mfr., Inc. v. U.S. Int’l Trade Comm’n*, 958 F.2d 1066, 1070-1074 (Fed. Cir. 1992) (“*LaBounty*”).

¹¹⁶ *Id.*; *Kingsdown Med. Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 872 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1067 (1989) (“*Kingsdown*”).

¹¹⁷ *Kingsdown*, 863 F.2d at 874.

¹¹⁸ 37 C.F.R. § 1.56(a).

will be sufficient to establish inequitable conduct.¹¹⁹ Moreover, “[d]irect proof of wrongful intent is rarely available but may be inferred from clear and convincing evidence of the surrounding circumstances.”¹²⁰ The conduct at issue must be viewed in light of all the evidence, including evidence of good faith.¹²¹ In other words “where withheld information is material and the patentee knew or should have known of that materiality, he or she can expect to have great difficulty in establishing subjective good faith sufficient to overcome an inference of intent to mislead.”¹²²

“Information is material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent.”¹²³ A patent applicant, however, has no obligation to disclose a reference that is cumulative or less pertinent than those already before the examiner.¹²⁴ Under the rules of the PTO, information is material when it is not cumulative to information of record and it either (i) “establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim”; or (ii) “it refutes, or is inconsistent with, a position the applicant takes” in either opposing the PTO’s argument of unpatentability or asserting the applicant’s own argument of patentability.¹²⁵ Close cases,

¹¹⁹ *Am. Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1363 (Fed. Cir.), *cert. denied*, 469 U.S. 821 (1984) (“*American Hoist*”).

¹²⁰ *LaBounty*, 958 F.2d at 1076; *Bristol-Myers Squibb Co. v. Rhone-Poulenc Rorer, Inc.*, 326 F.3d 1226, 1239 (Fed. Cir. 2003) (“*Bristol-Myers*”); *GFI*, 265 F.3d at 1274; *Merck & Co. v. Danbury Pharmacal, Inc.*, 873 F.2d 1418, 1422 (Fed. Cir. 1989) (“*Danbury*”).

¹²¹ *Kingsdown*, 863 F.2d at 876.

¹²² *Bristol-Myers Squibb*, 326 F.3d at 1239 (citing *Akron Polymer Container Corp. v. Exxel Container, Inc.*, 148 F.3d 1380, 1384 (Fed. Cir. 1998) (“*Akron*”)); *see also GFI*, 265 F.3d at 1275.

¹²³ *LaBounty*, 958 F.2d at 1074; *GFI*, 265 F.3d at 1274; *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1179 (Fed. Cir. 1995) (“*Molins*”).

¹²⁴ *Halliburton Co. v. Schlumberger Tech. Corp.*, 925 F.2d 1435, 1439-40 (Fed. Cir. 1991) (“*Halliburton*”).

¹²⁵ 37 C.F.R. § 1.56(b).

however, “should be resolved by disclosure, not unilaterally by applicant.”¹²⁶

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

The patent statute provides that when an invention is made by two or more persons, they shall apply for the patent jointly.¹²⁷ Where there is joint inventorship, the patent must issue to all inventors.¹²⁸

The issuance of a patent creates a presumption that the named inventors are the true and only inventors.¹²⁹ “In order to rebut this presumption, a party challenging patent validity for omission of an inventor must present clear and convincing evidence that the omitted individual actually invented the claimed invention.”¹³⁰ Inventorship is a question of law.¹³¹

“Conception is the touchstone of inventorship.”¹³² It is the “formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention as it is hereafter to be applied in practice.”¹³³ “An idea is sufficiently ‘definite and permanent’ when ‘only ordinary skill would be necessary to reduce the invention to practice, without extensive research or

¹²⁶ *Abbott Laboratories v. TorPharm, Inc.*, 300 F.3d 1367, 1379 (Fed. Cir. 2002) (“*TorPharm*”) quoting *LaBounty*, 958 F.2d at 1076.

¹²⁷ 35 U.S.C. § 116; also see *Certain EPROM, EEPROM, Flash Memory, and Flash Microcontroller Semiconductor Devices, and Products Containing Same*, Inv. No. 337-TA-395, USITC Pub. No. 3136, Commission Opinion at 7 (October 1998) (“*Certain EPROM*”).

¹²⁸ 35 U.S.C. §§ 102(f), 116, and 256.

¹²⁹ *Ethicon, Inc. v. United States Surgical Corp.*, 135 F.3d 1456, 1460 (Fed.Cir.), cert. denied, 525 U.S. 923 (1998) (“*Ethicon II*”).

¹³⁰ See *Acromed*, 253 F.3d at 137.

¹³¹ *Ethicon II*, supra.

¹³² *Burroughs Wellcome Co. v. Barr Laboratories, Inc.*, 40 F.3d 1223, 1227 (Fed.Cir. 1994), cert. denied, 516 U.S. 1070 (1996) (“*Burroughs*”).

¹³³ *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed.Cir. 1986) (“*Hybritech*”).

experimentation.”¹³⁴ “The conceived invention must include every feature of the subject matter claimed in the patent.”¹³⁵ Moreover, in the case of patent claims having means-plus-function language, “the contributor of any disclosed means of a means-plus-function claim element is a joint inventor as to that claim, unless one asserting sole inventorship can show that the contribution of that means was simply a reduction to practice of the sole inventor’s broader concept.”¹³⁶

To be a joint inventor, “an individual must make a contribution to the conception of the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention.”¹³⁷ Each of the joint inventors, however, does not have to make the same type or amount of contribution to the invention; each needs to perform only a part of the task which produces the invention.¹³⁸ Further, a co-inventor need not make a contribution to every claim of a patent; a contribution to one claim is enough.¹³⁹ “Thus, the critical question for joint conception is who conceived, as that term is used in the patent law, the subject matter of the claims at issue.”¹⁴⁰

A person does not qualify as a joint inventor by merely assisting the actual inventor after conception of the claimed invention.¹⁴¹ “One who simply provides the inventor with well-known principles or explains the state of the art without ever having ‘a firm and definite idea’ of the claimed combination as a whole does not qualify as a joint inventor.”¹⁴²

In order to be considered a joint inventor, there must be clear and convincing evidence

¹³⁴ *Ethicon II, supra*, 135 F.3d at 1460.

¹³⁵ *Id.*

¹³⁶ *Id.* at 1463; quoted in *Certain EPROM, supra*.

¹³⁷ *Fina Oil & Chemical Co. v. Ewen*, 123 F.3d 1466, 1473 (Fed.Cir. 1997) (“*Fina*”).

¹³⁸ *Ethicon II, supra*.

¹³⁹ *Id.*

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.*

corroborating the individual's contribution.¹⁴³ In *Ethicon II*, the Federal Circuit noted in this regard that:

an inventor's testimony respecting the facts surrounding a claim of derivation or priority of invention cannot, standing alone, rise to the level of clear and convincing proof. *Price v. Symsek*, 988 F.2d 1187, 1194, 26 USPQ2d 1031, 1036 (Fed.Cir. 1993). The rule is the same for an alleged co-inventor's testimony. *See Hess*, 106 F.3d at 980. Thus, an alleged co-inventor must supply evidence to corroborate his testimony. *See Price*, 988 F.2d at 1194. Whether the inventor's testimony has been sufficiently corroborated is evaluated under a "rule of reason" analysis. *Id.* at 1195. Under this analysis, "[a]n evaluation of all pertinent evidence must be made so that a sound determination of the credibility of the [alleged] inventor's story may be reached." *Id.*

Corroborating evidence may take many forms. Often contemporaneous documents prepared by a putative inventor serve to corroborate an inventor's testimony. *See id.* at 1195-96. Circumstantial evidence about the inventive process may also corroborate. *See Knorr v. Pearson*, 671 F.2d 1368, 1373, 213 USPQ 196, 200 (CCPA 1982) ("[S]ufficient circumstantial evidence of an independent nature can satisfy the corroboration rule.") Additionally, oral testimony of someone other than the alleged inventor may corroborate. *See Price*, 988 F.2d at 1195-96.¹⁴⁴

IV. The '338 Patent

As stated earlier, the '338 patent has been litigated by SanDisk at the ITC on two previous occasions, making this investigation the third time SanDisk has asserted the '338 patent in front of three different presiding Administrative Law Judges. Based on the evidence presented in this investigation, the undersigned finds that it is unnecessary to perform a complete analysis of the '338 patent yet again¹⁴⁵ because an analysis of SanDisk's economic prong for domestic industry will be

¹⁴³ *Fina, supra*, 123 F.3d at 1474.

¹⁴⁴ *Ethicon II, supra*, 135 F.3d at 1461; *quoted in Certain EPROM*, Initial Determination at 97-98 (March 19, 1998, Public version April 29, 1998).

¹⁴⁵ Even if the undersigned were to do a complete analysis of the '338 patent, the undersigned previously stated, during the prehearing conference that,

I did want to mention, though, I meant to mention this at the beginning, and I believe it's related somewhat to this matter here. We're talking about, again, the 526

(continued...)

sufficient to show that there can be no relief for SanDisk regarding the '338 patent because SanDisk's evidence falls significantly below the standard of meeting their "preponderance of the evidence" burden.¹⁴⁶

While it has been customary for administrative law judges to address all outstanding issues in their initial determinations, the undersigned finds that this is an appropriate case where it would be a waste of judicial resources to go through a complete analysis of claim construction, infringement, domestic industry technical prong, validity, and enforceability, when it is clear that the economic prong of domestic industry has not been met, and when the Complainant has litigated the case at the Commission twice before.

ST takes issue with SanDisk's timing of the filing of the Complaint in this investigation,¹⁴⁷

¹⁴⁵(...continued)

proceeding, which, as the parties have indicated, is currently before the Federal Circuit. I understand the maxim of administrative law that nothing is ever set in stone, at least when a new case is filed, and that I am free to revisit matters in this case. However, it is my intention to adopt the Commission's claim construction to the extent it was decided in the 526 proceeding for purposes of this case. And this is a fairly recent case. I don't see any need to revisit that. I understand that I'm free to do that. But given the circumstances, unless someone can really show me some reason why I should deviate from what the Commission has already decided, I'm not going to do that.

Bullock, Tr. 20 (12/01/06).

¹⁴⁶ See *Certain Encapsulated Integrated Circuit Devices and Products Containing Same*, Inv. No. 337-TA-501 (Remand), Initial Determination at 102 (Nov. 9, 2005) ("*Certain Encapsulated Integrated Circuits*") ("The burden of showing something by a 'preponderance of the evidence' . . . simply requires the trier of fact to believe that the existence of a fact is more probable than its nonexistence before [he] may find in favor of the party who the burden to persuade the [judge] of the fact's existence.")

¹⁴⁷ See RIB 1 ("SanDisk acted in haste. Barely a month after the Commission affirmed Judge Luckern's ruling in 337-TA-526 that ST's and SanDisk's NAND products do not practice the means-plus-function limitations of the then-asserted '338 claims, SanDisk filed again. In this second consecutive action against ST in under 15 months, SanDisk reasserted the '338 patent, and added the '517 and '956 patents for good measure. SanDisk's haste made waste.")

which was just thirty-five days after the Commission determined to affirm Judge Luckern's determination of non-infringement of the '338 patent, which was subsequently affirmed by the Federal Circuit.¹⁴⁸ This may or may not be the basis for the inadequacy of SanDisk's presentation on the economic prong. Therefore, the timing of the filing of the Complaint, in and of itself, is not the basis for the undersigned's ruling on this matter. As has already been discussed in the undersigned's previous orders, SanDisk was relying on Intel, a licensee, for its domestic industry in the '338 patent. Yet SanDisk never contacted Intel before it filed the Complaint in this investigation. While there is no requirement for SanDisk to have contacted Intel before filing the Complaint, it would have been in SanDisk's best interest to do so, which was already discussed at length in Order No. 21.¹⁴⁹

To make matters worse, SanDisk took inconsistent positions regarding proving its case for economic prong for the '338 patent. In SanDisk's pleadings to the undersigned regarding the motion to enforce the subpoena against Intel, SanDisk represented to the undersigned, along with the other parties in this investigation, that SanDisk was relying "solely" on Intel's practice of the '338 patent for domestic industry. Yet, when the undersigned denied the motion to enforce the subpoena against Intel, SanDisk reverted back to its position that it would rely on its own licensing activities to prove domestic industry.¹⁵⁰ While SanDisk attempted to explain away the inconsistency by claiming they were regrettably litigating on "two parallel paths," the undersigned ruled that counsel should be held accountable to the statements made in their motions, and that SanDisk should be limited to relying only on Intel's practice of the '338 patent:

¹⁴⁸ *See SanDisk, supra.*

¹⁴⁹ *See also* Order No. 26.

¹⁵⁰ *See generally*, Tr. 99-124 (12/01/06), 134-162 (12/04/06).

To me if you wanted to keep your options open, you should have said this – for example, this is one of the main bases for – that we're going to be relying on for domestic industry. But to make a kind of unqualified statement here and then say, well, we didn't really mean that. I mean I guess it's – at a certain point I have to be able to rely on statements. I mean, I guess what you're saying is, well, it was our sole basis but it really wasn't our sole basis. I have a problem with that.¹⁵¹

[. . .]

This is something that I'm sure everyone who deals in this practice here at the Commission, the 337 practice, it's very fast track. It's very precise. We have rules that are much stricter – let's say, I've been at other administrative agencies where we haven't had these rules. But the fact that we are required, we the judges and the Commission are required to get these cases out as much as practical within the 18-month period, we have to have very strict rules. Here we have a case where it's complainant, this is the third time you've been here. I realize the facts are somewhat different. But complainant has some advantage in the sense they can pick the timing of the case. And the assumption is that, when complainant comes here, they are ready to go. They've gotten their – all of the discovery they need, at least from, let's say from Intel, if you're going to be relying on Intel, that's one example. And I come back again to the argument of the statements made to – made to the judge. I think these are very unequivocal statements. I understand there's some ambiguity here. But just as if someone fails to raise an issue in an expert report, and that expert is precluded from testifying, those are the rules. This is a highly specialized practice. And I think when you miss – when a mistake is made, the question is, it should – it seems to me, it should be upon the person who made the mistake. And I'm not saying it was a willful error. But it was one nonetheless. And I think I, and the others, have a right to rely on the statement that was made that complainant was relying on licensing with respect to Intel. So my ruling from Friday stands.¹⁵²

The ruling was that SanDisk was prohibited from using its own licensing activities as an alternate basis for proving economic prong of domestic industry in light of statements of counsel that Intel's practice of the '338 patent would be the *sole basis* for SanDisk's case for meeting the economic prong requirement. SanDisk then commissioned a report from Semico–CX-481–to prove Intel's domestic industry in the '338 patent. As discussed below, however, the Semico report is

¹⁵¹ Bullock, Tr. 121 (12/01/06).

¹⁵² Bullock, Tr. 160-62 (12/04/06).

based on nothing more than assumptions, guesses, and estimates, making it wholly unreliable and therefore entitled to no weight. Further, any testimony that relies solely on the Semico report is also entitled to no weight, *i.e.* CX-2234C (Napper Direct); CX-2296C (Napper Rebuttal).

SanDisk asserts that the economic prong of the domestic industry requirement for the ‘338 patent is satisfied under 19 U.S.C. § 1337(a)(3)(A), (B), and (C) because Intel, a licensee of the ‘338 patent, has made significant investment in plant and equipment, significant employment of labor or capital, and made a substantial investment in R&D and engineering related to the ‘338 patent.¹⁵³

According to SanDisk, Intel has manufactured and sold its StrataFlash (MLC NOR) line of products since 1997 and has sold 100 million L18/L30 StrataFlash between Q3-Q4 of 2003 and 1 billion flash memory chips by 2000 and 2 billion flash memory chips by 2003.¹⁵⁴ According to SanDisk, Intel’s 130 nm, 180 nm, and 250 nm NOR MLC (StrataFlash) products all practice the ‘338 patent.¹⁵⁵ SanDisk asserts that Intel has a fabrication facility in New Mexico that is used for manufacturing flash memory. SanDisk asserts that approximately 37%, 69%, 78%, and 64% of the revenue of all the flash memory manufactured at Intel’s New Mexico fab in 2002, 2003, 2004, and 2005, respectively, is attributable to the 130 nm, 180 nm, and 250 nm MLC NOR chips.¹⁵⁶

Specifically, SanDisk asserts that, for 2005, Intel had a \$4.3 million investment in domestic plant and equipment related to the 130 nm, 180 nm, and 250 nm StrataFlash. This is based on a “conservative estimation,” based on Intel’s total investment of \$11-\$12 billion in net property, plant

¹⁵³ CIB 59.

¹⁵⁴ CIB 59-60 citing CX-436 (Intel news release, 9/26/01); CX-437 (Intel news release, 4/10/03); CX-439 (Intel news release 5/22/00); CX-481C (Semico Report); CX-2234C (Napper Direct) at Q. 87-88.

¹⁵⁵ CIB 60 citing CX-2229C (Rhyne Direct) at Q. 1324-1404.

¹⁵⁶ CIB 60 citing CX-363 (Intel 10K); CX-481C (Semico Report); CX-2234C (Napper Direct) at Q. 107-13.

and equipment in the U.S. from 2003-2005.¹⁵⁷ SanDisk asserts that, between 2003 and 2005, Intel employed approximately 1700-2600 people to work in the U.S. related to the 130 nm, 180 nm, and 250 nm StrataFlash.¹⁵⁸ SanDisk asserts that, between 2003 and 2004, Intel invested approximately \$200 million in domestic R&D and engineering related to the 130 nm, 180 nm, and 250 nm StrataFlash.¹⁵⁹

ST asserts that SanDisk's domestic industry evidence is unreliable because there is no direct evidence from Intel regarding its U.S. economic activities related to the 130 nm, 180 nm, and 250 nm StrataFlash. ST asserts that the only evidence provided by SanDisk is a third party report¹⁶⁰ that is full of second-hand information, estimates, and unfounded assumptions, consisting of spreadsheets and document fragments with no narrative explanation or supporting witness testimony, which is completely unreliable and should be entitled to no weight. ST asserts that, as of matter of fact or policy, SanDisk's evidence should be rejected as insufficient to establish its legal standing to maintain this action on behalf of the purported "domestic industry." According to ST, the author of the Semico report was never produced for questioning regarding the sources used, or the assumptions made. Therefore, there is no way to verify the reliability of the estimates made. ST also asserts that SanDisk's reliance on its expert, Mr. Napper, is also unreliable because Mr. Napper relied on the numbers presented within the Semico report. Furthermore, ST notes that Mr. Napper made a

¹⁵⁷ CIB 60 citing CX-363 (Intel 10K); CX-442 (Intel worldwide manufacturing and assembly test sites at a glance - fabs); CX-481C (Semico Report); CX-2234C (Napper Direct) at Q. 96, 102-06, 113; Napper, Tr. 911.

¹⁵⁸ CIB 61 citing CX-363 (Intel 10K); CX-364 (Intel 10K); CX-481C (Semico Report); CX-600 (Intel 10K); CX-2234C (Napper Direct) at Q. 121-22; Napper, Tr. 911.

¹⁵⁹ CIB 61 citing CX-363 (Intel 10K); CX-380 (Intel presentation - continuing Moore's law cost reduction in non volatile semiconductor memories); CX-481C (Semico Report); CX-2234C (Napper Direct) at Q. 114, 116, 120.

¹⁶⁰ CX-481 (Semico Report).

miscalculation in his expert report, which rippled through all of his calculations, making his testimony further unreliable.¹⁶¹

ST asserts that, even if the estimates of Intel's 130 nm manufacturing activities were accepted, SanDisk has not met its burden. According to ST, both the Semico report and Mr. Napper attribute 100% of the cost of manufacturing and employment to Intel's fabrication facilities, ignoring all other production steps. According to ST, the evidence shows that Intel conducts final production of its flash memory chips at assembly and test facilities in the Philippines and China. Therefore, ST asserts that SanDisk should have performed a comparative analysis of the production activities to determine whether the domestic portion is significant, but that SanDisk failed to do so.¹⁶²

ST also asserts that, by April 1, 2007, Intel will have totally withdrawn from producing the domestic industry products. The Semico report shows that Intel discontinued producing the 250 nm in 2002 and the 180 nm in 2004. As for the 130 nm, production will be completely phased out by the second quarter of 2007, when it will be replaced by the 90 nm, which SanDisk does not allege to practice the '338 patent.¹⁶³ According to ST, voluntary withdrawal from the market eliminates the required domestic industry and extinguishes the need for a remedial order.¹⁶⁴

Staff asserts that the publicly available information, relied upon by SanDisk, is insufficient to allow SanDisk to meet its burden of proof regarding the economic prong for the '338 patent. According to Staff, based on the evidence in the record, a preponderance of the evidence does not

¹⁶¹ RIB 58-59; RRB 22-23.

¹⁶² RIB 59 citing *Certain Microlithographic Machines and Components Thereof*, Inv. No. 337-TA-468, Initial Determination at 347-52 (January 29, 2003) ("*Certain Microlithographic Machines*").

¹⁶³ RIB 60 citing CDX-II-155; RFF2315-17.

¹⁶⁴ RIB 60 citing *Certain Variable Speed Wind Turbines*, Inv. No. 337-TA-376, Comm'n Op. at 26 (September 23, 1996) ("*Certain Wind Turbines*").

show how much Intel has invested in the United States related to the 130 nm, 180 nm, and 250 nm StrataFlash, and whether the investment is substantial or significant, as required by Section 337.¹⁶⁵

According to Staff, SanDisk relies exclusively on Intel's investments in plant, equipment, labor, and capital in its New Mexico fab. Staff asserts, however, that Intel has never publicly disclosed the level of its property, plant and equipment allocated to its New Mexico fab, nor how many people are employed in New Mexico, along with what kind of work they do.¹⁶⁶ According to Staff, SanDisk's arguments are based on nothing more than the fact that Intel, at one point in time, produced chips at the New Mexico fab.¹⁶⁷ As for Intel's research and development, SanDisk's analysis is also entirely speculative because there is simply no evidence of where Intel conducted any research and development relating to [] chips.¹⁶⁸

Staff counters ST's argument that it is impossible to base a domestic industry on a product that has been discontinued.¹⁶⁹ According to Staff, whether a domestic industry continues to exist is a factor that may be considered, but the fact that there is no longer any domestic production does not, by itself, indicate that relief is not appropriate.¹⁷⁰ Staff also disagrees that a "comparative analysis" of foreign and domestic investment is required.¹⁷¹

The undersigned finds that SanDisk has failed to meet its burden of proof for the economic prong of domestic industry for the '338 patent. The evidence cited by SanDisk is unreliable and

¹⁶⁵ SIB 60-61; SRB 31-33.

¹⁶⁶ SIB 61 citing CX-2234 (Napper Direct) at 33; Napper, Tr. 1012-13.

¹⁶⁷ SRB 32.

¹⁶⁸ SIB 62 citing Napper, Tr. 948-49; RX-2154C (Mulhern Rebuttal) at 12-13.

¹⁶⁹ SRB 32-33, n. 3.

¹⁷⁰ SRB 33, n. 3 citing *Certain Wind Turbines*, Comm'n Op. at 10-13.

¹⁷¹ SRB 33, n.3 citing *Certain Personal Computers, Server Computers, and Components Thereof*, Inv. No. 337-TA-509, Notice of Commission Determination at 2-3 (April 6, 2005) ("*Certain Personal Computers*").

unpersuasive. SanDisk's relies on estimates and projections from a market research firm hired for this investigation, rather than any concrete figures from Intel regarding these specific accused products. The only concrete numbers obtained from Intel were from its SEC filings, which report figures for total U.S. operations for all of its products.

Because SanDisk did not have any direct evidence from Intel, it hired a third party to put together a report, which was admitted into evidence as CX-481. The Semico Report quite explicitly states that the information contained in the report is based on "Semico's estimate of data not disclosed by Intel."¹⁷² As noted by Staff, "Complainant's methodology is to take a guess, divide it by an estimate, divide it by another estimate, and allocated the final figure based on an assumption."¹⁷³ A calculation that "adds vague estimation and gross extrapolation to unsupported presumption," that "[a]t every step . . . is fraught with speculation," cannot satisfy a party's burden of proof. The undersigned agrees. Because SanDisk has failed to produce any evidence of Intel's domestic industry other than the Semico report, along with the testimony of Mr. Napper, who also relies on the Semico report, SanDisk has failed to prove, by a preponderance of the evidence, that it has met the economic prong of domestic industry for the '338 patent.

Perhaps if SanDisk would have approached Intel before the Complaint was filed, SanDisk would have had the requisite information needed to prove its case, or SanDisk could have determined that Intel did not have a domestic industry in the '338 patent and not have asserted the '338 patent in this investigation. Instead, SanDisk, acting in haste, subjected ST to months of relitigating the '338 patent, wasting both public and private resources. Therefore, no other judicial

¹⁷² CX-481 (Semico Report) at SDITC-II 166601.

¹⁷³ SIB 62.

resources will be consumed in addressing this patent.

V. The '517 Patent

A. Claim Construction

1. Asserted Claims

The asserted claims read as follows (with the first instance of the disputed terms highlighted in *italics*):

1. A method of operating an *EEprom system* having memory cells that individually include an *electrically floating gate carrying a charge level that is alterable in response to appropriate voltage conditions being applied to the cell in order to set a variable threshold level thereof into a range that is determinable by reading the cell*, said method comprising:
 - applying said appropriate voltage conditions in parallel to a plurality of said memory cells, thereby to alter the charge levels on the floating gates of said plurality of memory cells,*
 - determining the threshold level ranges in which individual ones of said plurality of memory cells lie, and*
 - terminating said application of appropriate voltage conditions to individual ones of said plurality of memory cells upon their being determined to have reached desired threshold level ranges while continuing to apply said appropriate voltage conditions to others of said plurality of cells until all of the plurality of cells are determined to have reached their desired threshold level ranges.*
3. The method of claim 1, wherein there are more than two threshold level ranges.
5. The method of claim 1, wherein the threshold level ranges are separated by more than one *breakpoint threshold level*, thereby to provide more than two non-overlapping threshold level ranges.
6. The method of claim 1, wherein said desired threshold level ranges include an erased threshold level range.
7. The method of claim 1, wherein the array of memory cells are grouped into *blocks* of cells wherein the *threshold levels of cells within a selected one of the blocks are changed together to a single given threshold level range* prior to applying said appropriate voltage conditions in parallel to the plurality of cells within said one block.

8. The method of claim 7, wherein individual ones of said blocks include a specific number of memory cells and said plurality of memory cells to which said *appropriate voltage conditions are applied in parallel are less than said specific number*, and additionally comprising repeating for another plurality of cells within said one block said applying, determining and terminating operations.
10. The method of any one of claims 1-9, carried out on a single integrated circuit chip.
12. The method of claim 1 wherein the desired ones of said threshold level ranges reached by applying appropriate voltage conditions to the plurality of memory cells correspond to a *chunk of input data being programmed into the memory system*.
13. The method of claim 12, wherein the plurality of cells are determined to have reached the desired threshold level ranges by *comparing the threshold levels of the plurality of cells with the chunk of input data*.
14. The method of claim 13, wherein *the chunk of input data is stored in a cache memory prior to being programmed into memory cells* within the EEPROM.

2. Disputed Claim Terms

a. Claim 1 - In General

A major underlying dispute between the parties is whether claim 1 is directed towards a “program operation” only, or whether claim 1 also covers an “erase operation.”¹⁷⁴ SanDisk asserts that claim 1 is only directed to programming. Both ST and Staff assert that claim 1 is not limited to programming and can be directed to erasing as well.

¹⁷⁴ Although the undersigned is not in agreement with ST that SanDisk’s “overview” violates Ground Rule 8.2, which is discussed below, the undersigned does find that the inclusion of this “overview” section by SanDisk has made it difficult to analyze the parties’ specific claim construction arguments. Generally, the undersigned requires parties to follow the same general outline for their briefs in order to be able to easily identify each party’s position on a particular issue. See Ground Rule 11.3. The undersigned does not require a joint narrative statement of issues, as some other ALJs may require, because the undersigned would like to give the parties as much latitude in preparing their briefs as they’d like. If parties cannot, however, agree to which claim terms are actually in dispute, then the undersigned will require parties to prepare an outline before the briefs are due and adhere to it strictly. It is difficult enough to analyze claim construction issues without having to find where the arguments are for a particular disputed issue.

SanDisk asserts that the term “desired threshold level range” corresponds to a “desired” state that results from programming, not erasing.¹⁷⁵ In support, SanDisk points to the specification, which it alleges only refers to states and threshold levels that result from a program operation as “desired,” while it refers to the state that results from an erase operation as the “erased” state.¹⁷⁶

SanDisk also asserts that dependent claim 7 supports its claim construction. According to SanDisk, claim 7 clearly refers to a block erase operation, which is described as a “single given threshold level range.” SanDisk contrasts this term with “desired threshold level ranges” in claim 1. Because of the difference in terminology, “desired” in claim 1 versus “single given” in claim 7, SanDisk asserts that they are referring to two different operations.¹⁷⁷

Furthermore, SanDisk points to the prosecution history which refers to application claim 63 (issued claim 1) as directed to:

[P]rogramming a group of non-volatile memory cells by applying programming conditions to the cells in the group, monitoring their programmed states, and then terminating application of the programming conditions on a cell-by-cell basis as they reach their respective programmed states corresponding to data that is being stored in the memory.¹⁷⁸

SanDisk also argues that the issue of whether “altering” refers to adding or removing a charge is distinct from whether claim 1 only covers a program operation. According to SanDisk, whether or not the undersigned construes “altering” to include adding and removing a charge from the floating gate, this does not necessarily mean that claim 1 also covers an erase operation because of

¹⁷⁵ CIB 6 citing CX-99/RX-2 (the ‘517 patent) at col 21:33-34, 27:22-25, 27:60-64, 28:8-17.

¹⁷⁶ CIB 7-8.

¹⁷⁷ CIB 9-10.

¹⁷⁸ CIB 10 citing CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II-12603//ST560-H 17083-84.

the separate “desired threshold level ranges” limitation.¹⁷⁹ SanDisk, however, concedes that the convention used for programming is to add or remove charge.¹⁸⁰

ST counters all of SanDisk’s arguments. First, ST asserts that SanDisk has waived construing the term “desired” to “programming” because they did not preserve this issue in the pre-hearing brief.¹⁸¹ Second, ST asserts that because claim 1 refers to “appropriate voltage conditions . . . to alter” a cell’s floating gate charge, the claim covers removing a charge.¹⁸² According to ST, even SanDisk’s experts agree that the plain meaning of the claim includes erasing.¹⁸³ Furthermore, ST argues that SanDisk specifically told the Patent Office that claim 1 covered programming and erasing during prosecution.¹⁸⁴

The undersigned addresses the procedural issue first. As for ST’s argument that SanDisk failed to preserve the issue of construing the term “desired,” the undersigned finds that, although SanDisk could have briefed this issue with more specificity in its prehearing brief by clearly labeling it as a disputed claim term, it is hereby determined that it was sufficiently preserved.¹⁸⁵

Now, as to the substantive arguments, the undersigned finds ST and Staff’s arguments to be persuasive. The strongest support for ST and Staff’s position comes from looking at claims 1 and 6. Claim 6, which depends from claim 1, reads as follows:

¹⁷⁹ CIB 11.

¹⁸⁰ CIB 11, n. 6, which states that the usual convention in the industry, as testified by Dr. Subramanian, is to program by adding charge to the floating gate. Subramanian, Tr. 1069.

¹⁸¹ RRB 1 citing Ground Rule 8.2.

¹⁸² RRB 1.

¹⁸³ RRB 1 citing Rhyne, Tr. 1771 (“plain meaning of the word to alter includes increasing and decreasing”); Rao, Tr. 3125 (claim 1 “covers erasure”); RPX-22 (water into cup physical exhibit) (“to alter” includes decreasing).

¹⁸⁴ RRB 1.

¹⁸⁵ See SanDisk’s Prehearing Brief at 115 (“These desired ranges correspond to data that is being programmed into the cells.”).

The method of claim 1, wherein said desired threshold level ranges include an erased threshold level range.¹⁸⁶

Based on claim 6 above, it is clear that the “desired threshold level ranges” referred to in claim 1 can include an erased threshold level range. While the “desired threshold level ranges” referred to in claim 1 does not have to include such an erased threshold level range, as is required by claim 6, it can include an erased threshold level range. Therefore, to construe “desired threshold level ranges” as only referring to programming, and not including erasing, would be incorrect.

The undersigned rejects SanDisk’s arguments regarding the comparison of claims 1 and 7. The fact that claim 7 refers to a “single given threshold level range,” rather than “desired threshold level ranges” does not preclude claim 1 from including an erase operation.

While the specification does make repeated reference to a “desired” state that results from programming, rather than erasing, the claims themselves do not limit the construction of “desired” in referring to a program operation exclusively. Furthermore, the specification does make some reference to “desired” with respect to the erasing.¹⁸⁷

The undersigned agrees with Staff that the prosecution history is, at best, ambiguous. While SanDisk asserts that during the prosecution history, the applicants described application claim 63 (issued claim 1) as directed to “programming,” ST also asserts that the applicant’s preliminary amendment also implied that the new claims were intended to encompass not only those claims of the ‘338 patent that cover programming, but also those claims of the ‘338 patent, *i.e.* claim 40, that

¹⁸⁶ CX-99/RX-2 (the ‘517 patent) at col. 31:9-10.

¹⁸⁷ CX-99/RX-2 (the ‘517 patent) at col. 7:61 (“desired to be erased”) and col. 7:10 (“desired sector” for erasure).

covers erasing.”¹⁸⁸ In the absence of a clear disclaimer of scope, the prosecution history cannot change the meaning of the claims.¹⁸⁹ In this instance, the prosecution history does not help clarify the meaning of the claim term. Therefore, it will not be considered.

Based on the above, the undersigned finds it unnecessary to address the parties’ arguments regarding whether term “alter” necessarily means that claim 1 covers programming and erasing. “Alter” will be construed in further detail below.

Therefore, a reading of the claims themselves supports the undersigned’s finding that the term “desired” is not limited to programming. Accordingly, the undersigned finds that claim 1 is directed toward a “program operation” as well as an “erase operation.”

b. “EEPROM system” (claim 1)

SanDisk asserts that the claim term “EEPROM system” should be construed as “a system that includes one or more EEPROM arrays under the control of a controller.”¹⁹⁰ Staff agrees.¹⁹¹ ST asserts that the term “EEPROM system” is not a limitation of claim 1 and need not be construed because it is a non-limiting introduction to the method steps that follow in the claim.¹⁹²

SanDisk asserts that its construction is based on the plain meaning of the term “EEPROM system” as known by a person of ordinary skill in the art.¹⁹³ Staff asserts that, because the claims cover a method of operation, the device must have some sort of controller in order to operate the

¹⁸⁸ CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II 12567/ST560-H 17074; Rhyne, Tr. 1785-86.

¹⁸⁹ *Markman*, 52 F.3d at 980.

¹⁹⁰ CIB 14 citing CX-2229C (Rhyne Direct) at Q. 415.

¹⁹¹ SIB 28 citing CX-99/RX-2 (“the ‘517 patent”) at col. 2:1-3; 4:32-33; 5:1-3; 7:22-24; 20:22-26.

¹⁹² RIB 3.

¹⁹³ *See, infra*, Section V(D)(1).

device.¹⁹⁴

The undersigned finds SanDisk and Staff's arguments persuasive and that the term "EEPROM system" should be construed. As SanDisk and Staff are the only parties that proposed a claim construction for this claim term, their claim construction is hereby adopted, which is construed consistently with the specification.¹⁹⁵ Accordingly, the phrase "EEPROM system" in claim 1 is construed to mean: **"a system that includes one or more EEPROM arrays under the control of a controller."**

c. **"Electrically floating gate" (claim 1)**

SanDisk asserts that the claim term "electrically floating gate" should be construed as "a gate that is surrounded by a dielectric material so as to be insulated from other conductive elements."¹⁹⁶ ST does not propose a construction for this claim term. Staff asserts that, because there is no substantive dispute over this claim limitation, it does not need to be construed.¹⁹⁷ As there is no real dispute, the claim construction proposed by SanDisk is hereby adopted, which is supported by the specification.¹⁹⁸

Accordingly, the phrase "**electrically floating gate**" in claim 1 is construed to mean: **"a gate that is surrounded by a dielectric material so as to be insulated from other conductive elements."**

¹⁹⁴ SIB 28.

¹⁹⁵ CX-99/RX-2 ("the '517 patent") at col. 2:1-3 ("A Flash EEPROM memory system comprises one or more Flash EEPROM chips under the control of a controller.").

¹⁹⁶ CIB 14 citing CX-2229C (Rhyne Direct) at Q. 417.

¹⁹⁷ SIB 13.

¹⁹⁸ CX-99/RX-2 ("the '517 patent") at col. 18:39-44 ("Each of the memory cells 1011 and 1013 contains respective conductive floating gates 1023 and 1025, generally made of polysilicon material. Each of these floating gates is surrounded by dielectric material so as to be insulated from each other and any other conductive elements of the structure.").

d. “Alterable” (claim 1)

SanDisk does not give a straightforward claim construction for this claim term. Instead, SanDisk argues that both ST and Staff are confusing the two distinct issues of whether “altering the charge” on the floating gate is limited to adding charge to the floating gate, or can also mean removing a charge, and whether claim 1 covers only a program operation or also covers an erase operation.¹⁹⁹ According to Staff, while SanDisk argued that “alterable” should be construed as “increasing the charge level,” *i.e.*, programming the cell, in its pre-hearing brief,²⁰⁰ SanDisk has now reversed course and appears to concede that “alterable” refers to both adding and subtracting charge.²⁰¹ ST asserts that the term “alterable” should be construed as “increasing the charge levels or decreasing the charge levels.”²⁰² Staff agrees with ST.²⁰³

ST asserts that the plain meaning of “to alter the charge levels” undisputedly includes increasing the charge levels or decreasing the charge levels.²⁰⁴ According to ST, the specification expressly discloses altering the charge levels by applying appropriate voltage conditions to decrease them, which is consistent with the plain meaning of the term.²⁰⁵ ST asserts that SanDisk’s claim construction, limiting claim 1 to programming, should be rejected because it is contrary to the plain meaning of the term.²⁰⁶

¹⁹⁹ CIB 10-11.

²⁰⁰ Complainants’ Prehearing Brief 120-29.

²⁰¹ SRB 12 citing CIB 11.

²⁰² RIB 5-6.

²⁰³ SIB 29.

²⁰⁴ RIB 5 citing RX-1801C (Subramanian Direct) at 81-83; RX-2153C (Subramanian Rebuttal) at 33-39; Rhyne, Tr. 1771.

²⁰⁵ RIB 5-6 citing RX-1801C (Subramanian Direct) at 83-85; RX-2153C (Subramanian Rebuttal) at 39-44; Rhyne, Tr. 2369-74; RDX-40.

²⁰⁶ RIB 6 citing RX-1801C (Subramanian Direct) at 85-87; RX-2153C (Subramanian (continued...))

Staff asserts that the plain meaning of “alter” is “to change.”²⁰⁷ In addition, Staff notes that when a claim in the ‘517 patent is limited to programming, the term “programming” is used, rather than the term “alter.” And when different words or phrases are used in separate claims, a difference in meaning is presumed.²⁰⁸

All parties agree that the conventional use of the term “alter” refers to both increasing and decreasing.²⁰⁹ The undersigned finds that there is no indication in the specification that the applicant chose to assign a different meaning to “alterable” than its plain meaning.

Accordingly, the phrase “**alterable/to alter**” in claim 1 is construed to mean: “**increasing or decreasing.**”

e. “Appropriate voltage conditions” (claim 1)

SanDisk asserts that the claim term “appropriate voltage conditions being applied to the cell in order to set a variable threshold level thereof into a range that is determinable by reading the cell” should be construed as referring to “one or more program voltage pulses that individually shift the threshold level of the cell into a threshold level range corresponding to a state.”²¹⁰ ST does not propose a claim construction for this claim term in its brief.²¹¹ Staff asserts that “appropriate voltage conditions” should not be restricted to any particular types of voltage conditions, but should include all voltage conditions that one of ordinary skill in the art would understand were appropriate to alter

²⁰⁶(...continued)

Rebuttal) at 44-47; Rhyne, Tr. 1786.

²⁰⁷ SIB 29 citing WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 63 (1981).

²⁰⁸ SIB 29 citing *Nystrom v. TREX Co.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005) (“*Nystrom*”).

²⁰⁹ SanDisk’s expert, Dr. Rhyne, conceded at trial that “to alter includes increasing and decreasing” (Rhyne, Tr. 1771); RIB 5; SIB 29-31.

²¹⁰ CIB 14 citing CX-2229C (Rhyne Direct) at Q. 418.

²¹¹ Staff notes, however, that ST has addressed this issue in their findings of fact. SRB 12.

the charge level of the floating gate.²¹² In other words, SanDisk asserts that the claim only covers hot electron injection, while Staff asserts that the claim covers both hot electron injection and Fowler-Nordheim tunneling.²¹³

SanDisk asserts that the plurality of cells to which the “appropriate voltage conditions” are applied reach their “desired threshold level ranges.” SanDisk argues that cells reach their “desired threshold level ranges” as the result of a program operation, not an erase operation. Therefore, according to SanDisk, “appropriate voltage conditions” are conditions for programming, not erasing. SanDisk asserts that its claim construction is correct based on claim differentiation and points to dependent claim 7. According to SanDisk, the block erase operation in claim 7 occurs “prior to applying said appropriate voltage conditions in parallel” to a plurality of cells within the block. SanDisk argues that claim 7's reference back to the “said appropriate voltage conditions,” which is recited in claim 1 necessarily means that “said appropriate voltage conditions” are those required to perform a program operation, not an erase operation.²¹⁴

Staff asserts that both SanDisk's and ST's experts agree that, although the '517 patent only discloses programming by means of hot electron injection, one of ordinary skill in the art would understand that Fowler-Nordheim tunneling could also be used to program cells.²¹⁵ Staff also asserts that the specification discloses the use of hot electron injection for programming and Fowler-Nordheim tunneling for erase.²¹⁶ In addition, the Staff notes that the specification refers to voltage conditions that both the '517 and '338 patents list for erase are those conditions used to create

²¹² SIB 31.

²¹³ SIB 31.

²¹⁴ CIB 14 citing CX-2229C (Rhyne Direct) at Q. 418.

²¹⁵ SIB 31 citing CX-2229C (Rhyne Direct) at 331; Subramanian, Tr. 1227-28.

²¹⁶ SRB citing Rhyne, Tr. 1828; Subramanian, Tr. 1083-85.

Fowler-Nordheim tunneling.²¹⁷

As noted above, the undersigned rejected SanDisk's argument that claim 1 is solely directed to programming. As SanDisk has not presented any other arguments, SanDisk's claim construction is rejected. In addition, the undersigned finds Staff's arguments persuasive. The Federal Circuit has "expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment."²¹⁸

Accordingly, the phrase "**appropriate voltage conditions**" in claim 1 is construed to mean: "**all voltage conditions that are appropriate to alter the charge level of the floating gate.**" In other words, claim 1 covers both hot electron injection and Fowler-Nordheim tunneling.

f. "Applying said appropriate voltage conditions in parallel to a plurality of said memory cells" (claims 1 and 7)

SanDisk asserts that the claim term "applying said appropriate voltage conditions in parallel to a plurality of said memory cells" should be construed consistently as the term was construed above. In addition, SanDisk asserts that the phrase "in parallel to a plurality of memory cells" should be construed as "two or more cells receive the recited appropriate voltage conditions simultaneously," which SanDisk asserts is not in dispute.²¹⁹ ST asserts that the "plurality" is limited solely to cells whose threshold level ranges are intentionally changed by performing the claimed applying appropriate voltage conditions step.²²⁰ Staff asserts that the claim term should be construed

²¹⁷ SIB 31 citing Subramanian, Tr. 1083-85; CX-98/RX-1 (the '338 patent), figs. 18-19; CX-99/RX-2 (the '517 patent), figs. 26-27.

²¹⁸ *Phillips*, 415 F.3d at 1323.

²¹⁹ CIB 14-15.

²²⁰ RIB 3-4 citing RDX-57.

to mean that “appropriate voltage conditions are applied to two or more cells simultaneously.”²²¹

Staff asserts that the dispute between the parties is what is meant by “said” appropriate voltage conditions. According to Staff, ST asserts that the same voltage conditions must always be applied in the same operation. In other words, once the device applies a particular set of voltage conditions to alter the charge level, it must continue exactly the same voltage conditions, *i.e.* the device must apply constant voltage pulses.²²² Staff asserts that, because the preamble refers to voltage conditions appropriate to alter the charge level of the floating gate in order to set a threshold level for the cell, the “said appropriate voltage conditions” are the same voltage conditions. Therefore, the “said appropriate voltage conditions” should not be limited to constant or increasing pulses.²²³

The undersigned finds Staff’s arguments to be persuasive. The use of the term “said” in a patent specifically refers to an antecedent basis.²²⁴ The term “said” does not change the meaning of the antecedent to which it refers.²²⁵ As the undersigned has already construed the term “appropriate voltage conditions” above, the reference to “said appropriate voltage conditions” is construed the same. In addition, the parties appear to agree on the meaning of the term “plurality” as “two or more.”²²⁶

Accordingly, the phrase “**applying said appropriate voltage conditions in parallel to a plurality of said memory cells**” in claims 1 and 7 is construed to mean: “**appropriate voltage**

²²¹ SIB 32 citing CX-99/RX-2 (the ‘517 patent) at col. 21:31-47, 27:20-45; Fig. 23.

²²² SIB 33 citing Respondents’ prehearing brief 63-70.

²²³ SIB 33; SRB 14-15.

²²⁴ MPEP § 2173.05(e) (8th ed. 2005); *Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006) (“*Energizer*”).

²²⁵ See *In re Self*, 671 F.2d 1344, 1347 (C.C.P.A. 1982) (“*Self*”).

²²⁶ CIB 15, RIB 3, SIB 32.

conditions are applied to two or more cells simultaneously.”

g. “Determining the threshold level ranges in which individual ones of said plurality of memory cells lie” (claim 1)

SanDisk asserts that the claim term “determining the threshold level ranges in which individual ones of said plurality of memory cells lie” should be construed as “determining, on a cell-by-cell basis, in which threshold level range an individual cell undergoing programming lies.”²²⁷ ST asserts that the term should be construed as “requiring, for each memory cell in the plurality, establishing the threshold level range in which its inversion layer forms.”²²⁸ Staff asserts that the claim term should be construed as “referring to determining the threshold level range in which each cell of the plurality lies.”²²⁹

SanDisk asserts that its claim construction is supported by the specification. Pointing to Figures 14 and 15A, SanDisk asserts that the specific threshold level range for a particular cell defines the state of that cell. Therefore, there is a one-to-one correspondence between a cell’s state and the threshold level range in which the cell lies. SanDisk also asserts that the specification explains that the state of cell may be defined in terms of either threshold level ranges or the source-drain current ranges that correspond to the threshold level ranges.²³⁰ According to SanDisk, the corresponding source-drain current window for Figure 15A is shown in Figure 15B. Therefore, SanDisk asserts that the specification treats threshold voltage and source-drain current as interchangeable and that either voltage or source-drain current can be used to determine the cell’s

²²⁷ CIB 15.

²²⁸ RIB 6 citing RDX-59.

²²⁹ SIB 33-34 citing CX-99/RX-2 (the ‘517 patent) at Figs. 14A, 15B; col. 21:15-30, 21:48-55, 22:43-23:60.

²³⁰ CIB 16 citing CX-2229C (Rhyne Direct) at Q. 450.

state and threshold level range.²³¹

SanDisk also asserts that the “determining” step includes, but does not require “margin.” According to SanDisk, “margin” is used during the verify read operation to ensure that minor variations do not impact the one-to-one correspondence between a programmed cell’s threshold level range and its state. SanDisk asserts that, because claim 16 depends from claim 1, and adds the limitation that programming of cells is terminated “upon their being determined to have been programmed to within the desired threshold levels by a margin,” the determining step provides a margin to ensure that, when the cell is programmed, there is a one-to-one correspondence between the cell’s threshold level range and its state.²³²

Staff asserts that the dispute over this limitation appears to be whether this method step requires measuring the threshold level of each cell, or whether any method of determining the range into which the cell falls may be used. According to Staff, while Figure 15A compares threshold levels directly, Figure 15B compares threshold levels indirectly by measuring the source-drain current. Staff asserts that the “determining” step in claim 1 requires determining the memory state of the cell in relation to a threshold level range, but that it does not require the measuring of the threshold level of cells to be direct.²³³ Therefore, Staff states that this claim limitation is not limited to measuring the threshold voltage directly, but it is limited to cases in which the memory state of

²³¹ CIB 16.

²³² CIB 17 citing CX-99/RX-2 (the ‘517 patent) at col. 30:14-19, 31:58-62.

²³³ SIB 34 citing CX-99/RX-2 (the ‘517 patent) at figs. 15A-15B, col. 22:60-66 (“Just as the breakpoint threshold levels (*see* FIGS.14 and 15A) are used to demarcate the different regions in the threshold voltage window, the I_{REF} levels are used to do the same in the corresponding source-drain current window. By comparing with the I_{REF} ’S, the conduction state of the memory cell can be determined.”)

the cell is determined by reference to its threshold voltage.²³⁴

ST opposes both SanDisk and Staff. According to ST, claim 1 does not recite determining a “state,” it recites determining a “threshold level range,” which is not the same thing.²³⁵ ST asserts that “state” is a much broader term than “threshold level range,” and that SanDisk’s attempt to use such a broad generic term be rejected.²³⁶ ST asserts that SanDisk’s expert, Dr. Rhyne, conceded that the “threshold level of a memory cell is a cell’s threshold voltage” which is the control gate voltage at which an inversion layer forms in the cell’s channel region allowing source drain conduction to begin.²³⁷ ST argues that, while there can be a relationship between conduction and threshold voltage, conduction is not the same thing as threshold voltage.²³⁸ ST asserts that a comparison of Figures 15A and 15B supports its argument, as the specification describes these alternative metrics. According to ST, these two figures depict two cells that have different conduction states, but are conceded to have the identical threshold level range, *i.e.* both in range 1353.²³⁹ ST argues that, because SanDisk recited “threshold level range” in this claim term, that the “threshold voltage” metric is the one that must be used to assign states, not conduction.²⁴⁰ ST asserts that, by the patent’s own disclosure, claim 1 does not encompass every technique capable of assigning states to cells.²⁴¹

The undersigned does not adopt SanDisk’s claim construction’s reference limiting the claim

²³⁴ SRB 15.

²³⁵ RIB 6.

²³⁶ RIB 8.

²³⁷ RIB 6 citing Rhyne, Tr. 1881-82. *See also* RX-1801C (Subramanian Direct) at 94-102; RX-2153C (Subramanian Rebuttal) at 57-66; JX-39C (Norman Dep) at 179-80.

²³⁸ RIB 7 citing Rhyne, Tr. 1884, 1910.

²³⁹ RRB 6 citing Rhyne, Tr. 1910; RX-2153C (Subramanian Rebuttal) at 450-53.

²⁴⁰ RRB 6-7 citing RX-1801C (Subramanian Direct) at A. 355-72; RX-2153C (Subramanian Rebuttal) at A. 453, 459-61.

²⁴¹ RRB 7 citing *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562-63 (Fed. Cir. 1991) (“*Unique Concepts*”).

to “programming,” which was rejected above. The undersigned also does not adopt SanDisk’s “marginizing” argument because there is no evidence that the applicant intended to encompass marginizing as part of the “determining” claim limitation. While there is a reference to marginizing in the specification, care should be taken not to import a limitation into the claim from the specification.²⁴²

The undersigned also does not find ST’s arguments to be persuasive. There is no mention of “inversion layers” anywhere in the specification; therefore ST’s claim construction will not be adopted. In addition, while the undersigned agrees that conduction is not the same thing as threshold voltage, there is a relationship between the two so that one can determine threshold voltage from conduction.

The undersigned finds Staff’s arguments to be persuasive. Based on the claim language, measuring the threshold level of each cell is not required as long as a method is used to determine the range into which the cells falls. The specification describes two figures which compare threshold level—Figure 15A compares it directly, while Figure 15B compares it indirectly by measuring the source-drain current:

Just as the breakpoint threshold levels (see FIGS. 14 and 15A) are used to demarcate the different regions in the threshold voltage window, the I_{REF} levels are used to do the same in the corresponding source-drain current window. By comparing with the I_{REF} ’S, the conduction state of the memory cell can be determined.²⁴³

Therefore, the claim limitation is met when the memory state of the cell is determined by reference to its threshold voltage, whether that be directly or indirectly.

Accordingly, the phrase “**determining the threshold level ranges in which individual ones**

²⁴² *Bell Atlantic*, 262 F.3d at 1270.

²⁴³ CX-99/RX-2 (the ‘517 patent) at figs. 15A-15B, col. 22:60-66.

of said plurality of memory cells lie” in claim 1 is construed to mean: “referring to determining the threshold level range in which each cell of the plurality lies.”

h. “Terminating said application of appropriate voltage conditions to individual ones of said plurality of memory cells” (claim 1)

SanDisk asserts that the claim term “terminating said application of appropriate voltage conditions to individual ones of said plurality of memory cells” should be construed as meaning that “an individual cell that has been determined to fall within its desired threshold level range will not receive additional applications of appropriate voltage conditions for the remainder of the program operation, and the program operation ends.”²⁴⁴ ST asserts that the term should be construed as “when a cell is first determined to have reached its desired threshold level range, preventing all further alteration of the charge level on the memory cell’s floating gate.”²⁴⁵ Staff asserts that the claim term should be construed to mean that “an individual cell that has been determined to fall within its desired threshold level range will not receive additional applications of appropriate voltage conditions for the remainder of the program operation.”²⁴⁶

SanDisk asserts that its claim construction is consistent with the plain meaning of the term “terminating” and that it is consistent with the description in the specification and prosecution history.²⁴⁷ For example, when a cell is verified as having reached its desired threshold level range,

²⁴⁴ CIB 17.

²⁴⁵ RIB 8 citing RDX-60.

²⁴⁶ SIB 34-35 citing CX-99/RX-2 (the ‘517 patent) at Fig. 23(6); col. 3:62-4:13, 21:35-42, 27:22-30, 28:8-17, 29:5-10, 29:60-64.

²⁴⁷ CIB 18 citing CX-2229C (Rhyne Direct) at Q. 479, 481; CX-2298C (Rhyne Rebuttal) at Q.48-49; CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II-17083-84/SDITC-II-012603-04, 12567;CX-102/RX-5 (“the ‘338 reexamination”) at SDITC-II-14444-46, 14636/SDITC-II-0001983-85.

its programming terminates.²⁴⁸

Staff agrees with SanDisk. Staff asserts that the main dispute over the construction of this claim limitation is whether the claim prohibits “program disturb,” in other words, whether terminating the application of appropriate voltage conditions means terminating the transfer of any electrons to the floating gate. Staff argues that the plain meaning of the term requires terminating the application of appropriate voltage conditions to a cell when that cell reaches the correct threshold level range. According to Staff, the fact that there is incidental leakage of charge because appropriate voltage conditions continue to be applied to other cells is irrelevant.²⁴⁹

ST asserts that its claim construction is supported by the prosecution history because the applicants made a clear and unmistakable disclaimer as to what “terminating” means in order to distinguish the ‘517 patent from the prior art.²⁵⁰ According to ST, SanDisk told the examiner that latch 1721 is set when a cell reaches its desired threshold level range, and “[s]etting of this latch terminates any further alteration of the charge of its associated cell that might result from further application of the appropriate voltage conditions to others of the plurality of cells being programmed in parallel.”²⁵¹ ST argues that Dr. Rhyne agreed that latch 1721 is the only enabling disclosure of cell-by-cell inhibiting.²⁵²

ST also asserts that its claim construction is supported by the claim construction in the 526

²⁴⁸ CIB 18 citing CX-2229C (Rhyne Direct) at Q. 475-78; CX-99/RX-2 (the ‘517 patent) at col. 3:62-4:1, 21:35-42, 27:18-26, 62-64, 28:8-17, 29:4-9, 60-62 Fig. 23; CX-2226C (Mehrotra Direct) at Q. 178-80, 184, 188, 192, 196, 202, 207.

²⁴⁹ SIB 35.

²⁵⁰ RIB 8.

²⁵¹ RIB 8 citing CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II 12646/ST560-H 17181.

²⁵² RIB 9, RRB 7 citing Rhyne, Tr. 2029-30.

investigation. According to ST, Judge Luckern adopted SanDisk's construction of the "means for inhibiting" limitation, where SanDisk represented to Judge Luckern that a memory cell will not have any additional electrons added to its floating gate once terminating occurs.²⁵³ According to ST, SanDisk concedes that its current position is inconsistent with the representations made to Judge Luckern.²⁵⁴

SanDisk counters ST arguments. According to SanDisk, ST's claim construction rewrites the plain language of the claim, is unsupported by the description in the specification, and is unsupported by the prosecution history.²⁵⁵

Staff also counters ST's arguments. According to Staff, ST's reference to the prosecution history does not relate to claim 1 of the '517 patent, but refers to claim 37 of the patent which requires preventing the application of appropriate voltage conditions to other cells in the plurality from altering the charge level of the inhibited cell.²⁵⁶

The undersigned finds SanDisk and Staff's arguments to be persuasive because their claim construction most closely resembles the plain and ordinary meaning of the term "terminating." In addition, ST's reference to the prosecution history does not support ST's arguments, as the cited reference does not even relate to application claim 63 (issued claim 1). Rather, the statement refers to application claim 100 (issued claim 37), which does not include any "terminating" language and is not at issue in this investigation. In order for there to be a disclaimer, it must be clear in the

²⁵³ RIB 9 citing Rhyne, Tr. 2033-35; CX-372C (the 526 ID) at 49-50.

²⁵⁴ RIB 9 citing Rhyne, Tr. 2035.

²⁵⁵ CIB 18 citing CX-2229C (Rhyne Direct) at Q. 483, 485, 487-89; Subramanian, Tr. 1210-11; CX-99/RX-2 (the '517 patent) at col. 21:42-47.

²⁵⁶ SIB 35 citing CX-103/RX-4 (the '517 prosecution history) at SDITC-II 12646/ST560-H 17181; SRB 15-16.

prosecution history.²⁵⁷ In this instance, the undersigned does not find that such a disclaimer was made. As to ST's argument that SanDisk's current position is inconsistent with the representations made to Judge Luckern during the 526 investigation, the undersigned finds that such argument is not convincing because the disputed claim term in the 526 investigation was the "means for inhibiting further programming of correctly verified cells among the plurality of addressed cells," which is different than this disputed claim term.²⁵⁸

Accordingly, the phrase "**terminating said application of appropriate voltage conditions to individual ones of said plurality of memory cells**" in claim 1 is construed to mean: "**an individual cell that has been determined to fall within its desired threshold level range will not receive additional applications of appropriate voltage conditions for the remainder of the program operation.**"

i. **"Continuing to apply said appropriate voltage conditions to others of said plurality of cells" (claim 1)**

SanDisk asserts that the claim term "continuing to apply said appropriate voltage conditions to others of said plurality of cells" should be construed as consistent as the term "appropriate voltage condition" was construed above.²⁵⁹ Staff agrees that this claim term should be construed consistently with how "appropriate voltage conditions" was construed above.²⁶⁰ ST asserts that the term should be construed as "continuing to apply the same set of voltage conditions as used at the outset of the

²⁵⁷ See *Markman*, 52 F.3d at 980 (in the absence of a clear disclaimer of scope, the prosecution history cannot change the meaning of the claims); *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) ("*Superguide*").

²⁵⁸ CX-372C (the 526 ID) at 47.

²⁵⁹ CIB 18.

²⁶⁰ SRB 14.

operation.”²⁶¹

SanDisk asserts that the appropriate voltage conditions are not limited to a single set of voltage conditions, which is reflected by the use of the term “voltage conditions,” which is plural. According to SanDisk, in 1989 it was well-known that a wide range of program pulse techniques could be used to apply “appropriate voltage conditions” to a cell, including ramped programming pulses as well as constant programming pulses.²⁶²

Staff asserts that the use of the word “continuing” does not mean that the same specific voltages must always be applied because the claim covers “continuing to apply said appropriate voltage conditions,” which Staff construed above as voltage conditions appropriate to alter the charge level.²⁶³ While Staff acknowledges that the claim term excludes voltage conditions appropriate for reading, the claim does include voltage conditions that program or erase the cell, such as both constant voltage pulses and incremental step pulse programming.²⁶⁴

ST asserts that the claim term “continuing to apply said appropriate voltage conditions” should refer to the same set of voltage conditions that were used in the first “applying” step.²⁶⁵ ST argues that the use of the term “continuing to apply said” refers back to the “applying” step; therefore, the “continuing” step requires the same exact voltage conditions as in the “applying”

²⁶¹ RIB 10 citing RDX-61.

²⁶² CIB 18 citing CX-2229C (Rhyne Direct) at Q. 419-20, 429; Pashley, Tr. 2763-65; CX-2225C (Harari Direct) at Q. 108; RX-1801C (Subramanian Direct) at Q. 258; CX-110 (the ‘685 patent) at Abstract.

²⁶³ SRB 14-15.

²⁶⁴ SRB 14.

²⁶⁵ RRB 5 citing *Phillips*, 415 F.3d at 1316.

step.²⁶⁶ ST asserts that the specification and prosecution history support its position.²⁶⁷

The undersigned agrees with SanDisk and Staff that “continuing to apply said appropriate voltage conditions” should be construed consistently with “appropriate voltage conditions” and “said appropriate voltage conditions” above. The claim construction does not require the same exact voltage conditions. While the use of the term “continuing” may imply that the only one set of voltage conditions needs to be applied, it was determined above that there are multiple conditions that may be applied in order to alter the charge level of the floating gate in order to set a threshold level for the cell.

Accordingly, the phrase **“continuing to apply said appropriate voltage conditions to others of said plurality of cells”** in claim 1 is not limited to the same set of voltage conditions as used at the outset of the operation and refers to **“all voltage conditions that are appropriate to alter the charge level of the floating gate.”**

j. **“Until all of the plurality of cells are determined to have reached their desired threshold level ranges” (claim 1)**

SanDisk asserts that the claim term “until all of the plurality of cells are determined to have reached their desired threshold level ranges” should be construed as “meaning that the recited programming steps will be performed until all of the plurality of cells are determined to have reached their desired threshold level ranges, at which point the EEprom system stops the program operation.”²⁶⁸ ST asserts that the term should be construed as “once the threshold level of each cell in the plurality has been established to have moved into the desired one of the two or more potential

²⁶⁶ RIB 10-11 citing Rhyne, Tr. 1830; RX-1801C (Subramanian Direct) at 77-78, 126-27.

²⁶⁷ RIB 11 citing Rhyne, Tr. 1832-40; RX-1801C (Subramanian Direct) at 78-79, 255; CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II 12603/ST560-H 17083.

²⁶⁸ CIB 19.

ending ranges, the terminating, determining and applying steps stop.”²⁶⁹ Staff asserts that the claim term should be construed to mean that “the application of appropriate voltage conditions to cells in the plurality will continue until all cells in the plurality have reached the desired threshold level ranges, at which point application of the appropriate voltage conditions stops.”²⁷⁰

SanDisk asserts that the plain meaning of “until” requires the system to affirmatively determine that all of the plurality of cells have reached their desired threshold level ranges. According to SanDisk, the determination is what causes the application of further appropriate voltage conditions to stop. SanDisk points to the specification in support.²⁷¹

ST asserts that claim 1 requires the steps of “applying,” “determining,” “terminating,” and “continuing to apply” to continue until all of the plurality of cells are determined to have reached their desired threshold level ranges. ST argues that the claim is explicit in that only “the plurality” are relevant to the “ranges” requirement. Therefore, according to ST, what claim 1 requires is that the plurality include some cells whose threshold levels reach one ending range and other cells whose threshold levels reach a second, different ending range.²⁷²

Staff opposes both SanDisk’s and ST’s argument. Staff opposes SanDisk’s arguments because SanDisk asserts that claim 1 only covers programming because cells being erased have only a single desired threshold level range, the erased state. Staff opposes ST’s arguments because ST asserts that claim 1 only covers multi-level cells because the cells whose charge levels are being

²⁶⁹ RIB 3 citing RDX-62.

²⁷⁰ SIB 35-36 citing CX-99/RX-2 (the ‘517 patent) at Fig. 23(5)-(7); col. 28:66-29:10, 29:29-41.

²⁷¹ CIB 19 citing CX-2229C (Rhyne Direct) at Q. 499-503; CX-99/RX-2 (the ‘517 patent) at col. 28:8-20, 29:29-34, Figs. 13, 24; Pashley, Tr. 2558.

²⁷² RIB 4 citing RX-1801C (Subramanian Direct) at 128-31; RX-2153C (Subramanian Rebuttal) at 104-08; Rhyne, Tr. 1764.

altered must reach more than one desired threshold level range. Staff asserts that its claim construction is exactly what is disclosed in the specification, where both single-level and multi-level cells, and both programming and erase, are described.²⁷³ Staff also asserts that, because dependent claims 2 and 4 cover single level cells, and dependent claims 3 and 5 cover multilevel cells, independent claim 1 must cover both. In addition, Staff asserts that dependent claim 10 requires that the claimed method be carried out on a single chip, which implies that the methods of claims 2 and 4 can be performed on a single chip.²⁷⁴

The undersigned does not adopt SanDisk's claim construction because it incorporates a "programming" requirement that was rejected above. The undersigned also does not adopt ST's claim construction because the use of the term "ranges" does not necessarily require that there be more than one desired threshold level range for the plurality of cells because such construction would make claim 1 inconsistent with certain dependent claims, such as claim 10 which covers the use of a single chip with single level cells.²⁷⁵

The undersigned finds Staff's arguments persuasive. The fact that the plurality of addressed cells must reach their desired ranges does not mean that each cell must have more than one desired threshold level range. Rather, it means that each cell must reach its range and the cells together must reach their ranges.²⁷⁶ In addition, the scope of an independent claim must encompass the scope of a claim that depends from it.

Accordingly, the phrase **"until all of the plurality of cells are determined to have reached**

²⁷³ SIB 36 citing CX-99/RX-2 (the '517 patent) at figs. 14, 15A, col. 21:15-60, col. 3:62-4:13.

²⁷⁴ SIB 36.

²⁷⁵ CX-99/RX-2 (the '517 patent) at col. 30:64-65, 31:1-4, 29-30.

²⁷⁶ CX-99/RX-2 (the '517 patent) at figs. 14, 15A, col. 21:15-60, col. 3:62-4:13.

their desired threshold level ranges” in claim 1 is construed to mean: **“the application of appropriate voltage conditions ceases when all cells in the plurality are in the desired memory state.”** In addition, the claim is not limited to types of cells, such as single-level or multi-level, or operations, such as programming or erasing.

k. “Breakpoint threshold level” (claim 5)

SanDisk asserts that the claim term “breakpoint threshold level” should be construed as “the threshold level that separates one threshold level range from another threshold level range.”²⁷⁷ ST asserts that the term should be construed as “a threshold level that partitions the threshold voltage window or memory cells.”²⁷⁸ Staff asserts that the claim term should be construed to mean “the threshold level that separates one threshold voltage range from another threshold voltage range.”²⁷⁹

While SanDisk and Staff’s constructions are quite similar, the undersigned finds SanDisk’s claim construction most closely reflects the plain meaning of this disputed claim term because of Staff’s extraneous reference to the term “voltage.” Accordingly, the phrase **“breakpoint threshold level”** in claim 5 is construed to mean: **“the threshold level that separates one threshold level range from another threshold level range.”**

l. “Blocks” (claims 7 and 8)

SanDisk asserts that the claim term “blocks” should be construed as “the Flash unit of erase, which is substantially larger than a byte or a word.”²⁸⁰ ST asserts that the term should be construed

²⁷⁷ CIB 19-20 citing CX-2229C (Rhyne Direct) at Q. 505-06; CX-99/RX-2 (the ‘517 patent) at col. 21:20-30, 51-53, Fig. 14-15; Subramanian, Tr. 1076-78.

²⁷⁸ RRB 7 citing RX-1801C (Subramanian Direct) at A. 342-54, 416-24; RX-2153C (Subramanian Rebuttal) at A. 421-22, 473, 524.

²⁷⁹ SIB 37 citing CX-99/RX-2 (the ‘517 patent) at Figs. 14, 15A; col. 21:26-28, 21:48-51.

²⁸⁰ CIB 20.

as “some number of cells greater than one that are grouped together for operational purposes.”²⁸¹ Staff asserts that the claim term “blocks of cells” should be construed to mean “groups of multiple memory cells.”²⁸²

SanDisk asserts that its claim construction is consistent with the plain meaning of the term. SanDisk points to the testimony of ST’s expert, Dr. Pashley, who stated that a flash EEPROM “can quickly erase a large block of memory at one time, or in a ‘flash’.”²⁸³ SanDisk also points to the specification which states that a large group of cells that is erased simultaneously is a “block” or “sector” while a smaller group of cells that is programmed simultaneously is a “chunk.”²⁸⁴ Based on its claim construction, SanDisk asserts that claim 7 covers a Flash EEPROM with block erase and the step of performing a block erase occurs prior to programming a plurality of cells within the block; that claim 8 adds a requirement that the plurality of cells programmed is less than the size of a block and that two such pluralities of cells are programmed; and that claim 11 covers performing a block erase on two or more selected blocks.²⁸⁵

Staff asserts that the main dispute regarding this claim term appears to be whether it should be construed as a “unit of erase” and whether the number of cells in the block is substantially larger than a byte or word. Staff notes that the specification uses the term “block” and “sector” interchangeably.²⁸⁶ Staff also points out that the specification states that

In the Flash EEprom array 1060 (FIG. 12), each group of memory cells which is

²⁸¹ RIB 12 citing RDX-64.

²⁸² SIB 37.

²⁸³ CIB 20 citing RX-1802C (Pashley Direct) at Q. 74.

²⁸⁴ CIB 20 citing CX-2229C (Rhyne Direct) at Q. 509-10; CX-99/RX-2 (the ‘517 patent) at col. 7:6-9, 14-17, 14:38-42, 16:4-9, 21:31-33, 25:7-11, 28:7-11, 24-25, 28-30, 38-57.

²⁸⁵ CIB 20.

²⁸⁶ SIB 37 citing CX-99/RX-2 (the ‘517 patent) at col. 7:6-8, 10:45-47.

collectively erased or programmed is called a sector.²⁸⁷

Therefore, Staff asserts that a block is not simply a unit of erase. In addition, Staff points out that the specification does not describe the size of a block. Rather, Staff asserts the specification notes that a sector may have 512 bytes.²⁸⁸

ST agrees with Staff and asserts that a “block” is simply a “groups of cells” that is not limited to a unit of erase.²⁸⁹ ST also points to the same portion of specification noted by Staff above.²⁹⁰ ST also notes that the specification does not limit the size of a block and that the claimed blocks are simply some number of cells greater than one grouped together for operational purposes. Because the term blocks is plural, ST asserts that at least two such blocks are required.²⁹¹

The undersigned finds ST’s and Staff’s arguments to be persuasive because the specification clearly states that a block/sector/group of memory cells, is not simply a unit of erase.²⁹² Although ST agrees that a block is a group of cells, ST proposes a claim construction with additional limitations, such as an “operational purpose,” that is extraneous to what is required to construe the claim. Therefore, the undersigned finds Staff’s claim construction to most clearly reflect the plain meaning of the term.

Accordingly, the phrase “**blocks of cells**” in claims 7, 8, and 11 is construed to mean: “**a group of more than one memory cell.**”

²⁸⁷ SIB 37-38 citing CX-99/RX-2 (the ‘517 patent) at col. 25:7-11.

²⁸⁸ SIB 38 citing CX-99/RX-2 (the ‘517 patent) at col. 7:28-30, 28:28-30.

²⁸⁹ RRB 7-8.

²⁹⁰ RRB 8 citing CX-99/RX-2 (the ‘517 patent) at col. 25:7-11.

²⁹¹ RRB 8 citing RX-1801C (Subramanian Direct) at A. 264-67, 443-49; RX-2153C (Subramanian Rebuttal) at A. 344-46, 530, 534-35, 537-58.

²⁹² CX-99/RX-2 (the ‘517 patent) at col. 25:7-11.

m. “A chunk of input data being programmed into the memory system” (claims 12 and 13)

SanDisk asserts that the claim term “a chunk of input data being programmed into the memory system” should be construed as “a quantity of information, typically several bytes, to be programmed into the plurality of memory cells.”²⁹³ ST asserts that the term should be construed as “N * L bits of user data, where N is the number of addressed cells and L is the number of bits per cell.”²⁹⁴ Staff asserts that the claim term should be construed to require “several bytes of data” to be programmed into the memory system.²⁹⁵

SanDisk asserts that its claim construction is consistent with the plain meaning of the term, which is also consistent with the way the term is used in the specification.²⁹⁶

According to Staff, the claim term “chunk of input data” was also at issue in the 526 investigation. Staff asserts that, because the ‘517 specification uses the phrase in the same way as the ‘338 patent, the claim term should be interpreted the same.²⁹⁷

ST asserts that Judge Luckern construed “chunk of data” in claim 27 of the ‘338 patent to be “the final target memory states for the cells being programmed.”²⁹⁸ According to ST, there is no reason to depart from Judge Luckern’s claim construction with respect to “chunk of input data” in claims 12-14 of the ‘517 patent because these claims were expressly patterned after claim 27 of the

²⁹³ CIB 20.

²⁹⁴ RIB 12 citing RDX-67.

²⁹⁵ SIB 39 citing CX-99/RX-2 (the ‘517 patent) at col. 3:57-58, 28:8-10.

²⁹⁶ CIB 20 citing CX-2229C (Rhyne Direct) at Q. 529-31 ; CX-99/RX-2 (the ‘517 patent) at col. 3:56-58, 28:8-11.

²⁹⁷ SIB 39; SRB 19.

²⁹⁸ RIB 13 citing CX-372C (the 526 ID) at 21.

‘338 patent.²⁹⁹ ST asserts that its claim construction is consistent with the plain meaning of the term, which is also consistent with the way the term is used in the specification and that a person of ordinary skill in the art would understand the claim term to require user data, not status flags.³⁰⁰

During the prehearing conference, the undersigned informed the parties that the undersigned intended to adopt the Commission’s claim construction from the 526 investigation.³⁰¹ As this disputed claim term, which is in the ‘517 patent, is being used similarly as it was used in the ‘338 patent,³⁰² the undersigned agrees that the claim construction adopted for this claim term in the 526 investigation should also be adopted here. In the 526 investigation, Judge Luckern stated that the term “‘chunk of data’ is typically several bytes of data.”³⁰³

Accordingly, the phrase “**a chunk of input data being programmed into the memory system**” in claims 12 and 13 is construed to require: “**several bytes of data to be programmed into the memory system.**”

n. “Comparing the threshold levels of the plurality of cells with the chunk of input data” (claim 13)

SanDisk asserts that the claim term “comparing the threshold levels of the plurality of cells with the chunk of input data” should be construed as “requiring determining when the threshold levels of the plurality of cells have reached the desired threshold level ranges corresponding to the

²⁹⁹ See CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II 12567/ST560-H 17074.

³⁰⁰ RIB 13 citing RX-1801 (Subramanian Direct) at 140-42; RX-2153C (Subramanian Rebuttal) at 124-27.

³⁰¹ Bullock, Tr. 20 (December 1, 2006 prehearing conference). See *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1030 (Fed. Cir. 2002) (“*Epcon*”) (the same term or phrase should be interpreted consistently where it appears in claims of common ancestry).

³⁰² It should be noted that, although the ‘338 patent and the ‘517 patent are not literally related, the specifications are identical in relevant part. SRB 19 citing CX-2229C (Rhyne Direct) at 26; CX-103/RX-4 (the ‘517 prosecution history) at SDITC-II 12566-67/ST560-H 17073-74.

³⁰³ CX-372C (the ‘526 Initial Determination) at 20.

data they are to store, *i.e.* the chunk of input data.”³⁰⁴ ST asserts that the term should be construed as “comparing the threshold level of each memory cell in the plurality of addressed cells against its corresponding bit in the chunk of input data.”³⁰⁵ Staff agrees with ST.³⁰⁶

SanDisk asserts that, while this claim term requires a comparison to be made, the comparison does not need to be direct; therefore, a comparator structure is not required. According to SanDisk, the claim limitation merely requires the step of comparing and does not recite any particular circuitry or structure used to achieve the comparison.³⁰⁷ In other words, SanDisk asserts that no particular structure is required by this method step.

ST asserts that the plain language of the claim term requires that the “threshold levels of the plurality of cells” be compared against the “chunk of input data.” According to ST, the specification explains that the threshold level of each cell in the plurality is assigned a bit value based upon the threshold level range in which it lies. One or more bits of user data will be stored for each cell, which collectively comprises the chunk of input data. After each pulse of appropriate voltage conditions, a verification is performed by reading the data bits out of each memory cell in the plurality and comparing them bit by bit against each bit of user data in the chunk of input data.³⁰⁸ In addition, ST counters SanDisk’s construction because it insists that no particular structure is

³⁰⁴ CIB 20-21 citing CX-2229C (Rhyne Direct) at Q. 537.

³⁰⁵ RIB 13 citing RDX-68.

³⁰⁶ SIB 39 citing CX-99/RX-2 (the ‘517 patent) at Fig. 23(5); col. 28:66-29:2.

³⁰⁷ CIB 21.

³⁰⁸ RIB 13-14 citing CX-99/RX-2 (the ‘517 patent) at Figs. 23-24; col 28:39-29:28; RX-1801 (Subramanian Direct) at 143-44; RX-2153C (Subramanian Rebuttal) at A. 568-72.

required, which is contrary to the specification.³⁰⁹ Staff agrees with ST.³¹⁰

The undersigned finds ST and Staff's arguments to be persuasive. The specification clearly states that this claim limitation requires comparing the data bits out of each memory cell in the plurality bit by bit against each bit of user data in the chunk of input data.³¹¹ In addition, the specification describes particular circuitry used to perform this comparison:

In each cell compare module such as the module 1701, the L read bits (L=number of binary bits encoded for each cell) are compared bit by bit with the corresponding program data bits.³¹²

This comparison is also shown in Figure 24, which is described in the specification as showing:

a "read data bit" produced by read circuits is compared by XOR gates against a "write data bit" produced from the read/program latches and shift registers 190 where the "chunk of input data" is stored.³¹³

These passages confirm that the chunk of input data is compared bit by bit with the threshold levels read from the plurality of addressed memory cells.

Accordingly, the phrase **"comparing the threshold levels of the plurality of cells with the chunk of input data"** in claim 13 is construed to mean: **"comparing the threshold level of each memory cell in the plurality of addressed cells against its corresponding bit in the chunk of input data."**

o. "Cache memory" (claim 14)

SanDisk asserts that the claim term "cache memory" should be construed as "any memory,

³⁰⁹ RRB 8 citing RX-1801C (Subramanian Direct) at Ans. 473-76; RX-2153C (Subramanian Rebuttal) at 568-72.

³¹⁰ SIB 39.

³¹¹ CX-99/RX-2 (the '517 patent) at Fig. 23(5); col. 28:66-29:2.

³¹² CX-99/RX-2 (the '517 patent) at col. 29:14-17.

³¹³ CX-99/RX-2 (the '517 patent) at col. 28:59-29:5.

distinct from the flash memory array, that is used to speed up the performance of the system by temporarily storing data to be programmed into memory cells.”³¹⁴ ST asserts that the term should be construed as “memory used to insulate the Flash memory device from enduring too many program/erase cycles allowing data to be operated on several times in the cache before being committed to the Flash memory.”³¹⁵ Staff asserts that the claim term should be construed by its ordinary meaning, which is “memory used to temporarily store data so as to speed up an operation.”³¹⁶

SanDisk asserts that its claim construction is consistent with the plain meaning of the term, which is also consistent with the way the term is used in the specification.³¹⁷ Staff also asserts that its claim construction is consistent with the plain meaning of the term, which is also consistent with the way the term is used in the specification.³¹⁸ ST asserts that the applicants defined “cache memory” as “novel” and “unlike . . . traditional caches.”³¹⁹ Therefore, ST asserts that the applicants acted as their own lexicographers in giving “cache memory” a special meaning for purposes of claim 14.³²⁰

³¹⁴ CIB 21.

³¹⁵ RIB 14 citing RDX-69.

³¹⁶ SIB 40 citing CX-2229C (Rhyne Direct) at 151-52; Subramanian, Tr. 1349; CX-99/RX-2 (the ‘517 patent) at col. 14:47-61, 2:44-54.

³¹⁷ CIB 21 citing CX-2229C (Rhyne Direct) at Q. 540-41; Subramanian, Tr. 1349; CX-99/RX-2 (the ‘517 patent), col. 14:46-61; 17:56-61; CX-1020 (Microsoft Press Computer Dictionary) at SDITC-II-067502-067508.

³¹⁸ SIB 40 citing CX-99/RX-2 (the ‘517 patent), col. 14:47-61; col. 2:44-54.

³¹⁹ RIB 14-15 citing CX-99/RX-2 (the ‘517 patent), col. 15:26-31 (“To overcome this problem, a cache memory is used in a novel way to insulate the Flash EEPROM memory device from enduring too many program/erase cycles. The primary function of the cache is to act on writes to the Flash EEPROM memory and not on reads of the Flash EEPROM memory, unlike the case with traditional caches.”)

³²⁰ RIB 14 citing *Boss Control, Inc. v. Bombardier Inc.*, 410 F.3d 1372, 1376-77 (Fed. Cir. (continued...))

The undersigned does not find ST's arguments to be persuasive. While the specification does use the term "cache memory" and "novel" in the same sentence, when reading the terms in context, there is no indication that the applicants were being their own lexicographers by assigning a particular meaning to the term "cache memory," other than its plain and ordinary meaning. Rather, the applicants were merely stating that "cache memory is *used* in a novel way."³²¹ The specification states that:

Cache memory is generally used to speed up the performance of systems having slower access devices.³²²

This is consistent with the plain meaning of the claim term, as testified by both SanDisk's and ST's experts.³²³

Accordingly, the phrase "**cache memory**" in claim 14 is construed to mean: "**memory used to temporarily store data so as to speed up an operation.**"

B. Infringement

SanDisk asserts that ST's NAND (SLC and MLC), [] flash memories and systems containing such chips infringe claim 1, 6-8, 10 and 12 of the '517 patent. SanDisk also asserts that ST's MLC NAND, [] chips infringe claims 3 and 5 of the '517 patent, while the [] also infringes claims 13 and 14 of the '517 patent.³²⁴ Furthermore, SanDisk asserts

³²⁰(...continued)
2005) ("*Boss Control*"); *Abraxis Bioscience, Inc. v. Mayne Pharma. (USA)*, 467 F.3d 1370, 1376 (Fed. Cir. 2006) ("*Abraxis*"); *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) ("*Chef America*").

³²¹ CX-99/RX-2 (the '517 patent), col. 15:26-31 (emphasis added).

³²² CX-99/RX-2 (the '517 patent), col. 14:47-61.

³²³ CX-2229C (Rhyne Direct) at 151-52; Subramanian, Tr. 1349.

³²⁴ CIB 34 citing CDX-II 103. The specific products alleged to infringe include the: 512 Mb F12 NAND, 256 Mb F12 NAND, 128 Mb F90 NAND, 256 Mb F90 NAND, 512 Mb F90 NAND
(continued...)

that ST's accused products contributorily infringe the asserted method claims of the '517 patent, and that ST induced infringement of the '517 patent.³²⁵

ST asserts that the none of its accused NAND or NOR products infringe any asserted claims of the '517 patent.³²⁶ ST also asserts that SanDisk failed to prove either contributory or induced infringement.³²⁷

Staff asserts that ST's NAND products infringe claims 1, 3, 5, 6, 7, 8, and 10 of the '517 patent; however, Staff asserts that ST's NAND products, do not infringe claims 12, 13, and 14 of the '517 patent. In addition, Staff asserts that ST's NOR products do not infringe any of the asserted claims of the '517 patent.³²⁸ Furthermore, Staff agrees that ST's sale of flash memory chips, and in particular, ST's sales of NAND chips for use in products such as flash cards and USB drives, indirectly infringe the asserted claims of the '517 patent.³²⁹

1. Claim 1

- a. Preamble (A method of operating an EEprom system having memory cells that individually include an electrically floating gate carrying a charge level that is alterable in response to appropriate voltage conditions being applied to the cell in order to set a variable threshold level thereof into a range that is determinable by reading the cell, said method comprising)**

SanDisk asserts that ST's flash memories meet all the limitations of the preamble of claim 1 of the '517 patent because []

³²⁴(...continued)
(small page), 512 Mb F90 NAND (large page), 1 Gb F90 NAND, 2 Gb F90 NAND, 4 Gb F90 MLC NAND, 2 Gb F70 NAND, and 4 Gb F70 NAND.

³²⁵ CIB 40-41.

³²⁶ RIB 29-41.

³²⁷ RIB 41-44.

³²⁸ SIB 47; SRB 22-23.

³²⁹ SIB 53.

] ³³²

ST does not directly address whether its accused chips practice the preamble, other than stating that none of its NOR or NAND products practice claim 1 of the '517 patent because of other claim limitations and its contributory and induced infringement arguments.³³³

Staff asserts that, although ST's accused chips, by themselves, are not a "method of operating an EEPROM system," the evidence shows that ST's chips are used as part of such EEPROM systems, which is particularly true for products that ST produces itself, *i.e.* flash cards. Therefore, Staff asserts that ST's accused chips indirectly infringe claim 1.³³⁴

The undersigned agrees with Staff that, ST's NOR and NAND chips, by themselves, do not constitute a "method of operating an EEPROM system." The evidence shows, however, that ST's NOR and NAND chips are used as part of such EEPROM systems, such as flash cards that are produced by ST itself, which is discussed more fully in the indirect infringement section below.³³⁵ Therefore, the undersigned finds that ST indirectly infringes the preamble of claim 1 of the '517 patent.

³³⁰ CIB 34 citing CFF 2008-11, 2194-2202, 2222, 2276-78.

³³¹ CIB 34-35 citing CFF 2223-24, 2312-16, 2276-82.

³³² CIB 35 citing CFF 2225-73, 2282-2311.

³³³ RIB 29-44.

³³⁴ SIB 48.

³³⁵ *See infra*, Section V(B)(11).

- b. First Limitation (applying said appropriate voltage conditions in parallel to a plurality of said memory cells, thereby to alter the charge levels on the floating gates of said plurality of memory cells)**

SanDisk asserts that ST's flash memories meet all the elements of the first limitation of claim 1 of the '517 patent because, [

] ³³⁶ Staff agrees with SanDisk that ST's accused products meet all the elements of the first limitation because [

] ³³⁷ ST does not directly address whether its accused chips practice the first limitation, other than based on its claim construction and stating that none of its NOR or NAND products practice claim 1 of the '517 patent because of other claim limitations and its contributory and induced infringement arguments. ³³⁸

Both SanDisk and Staff counter ST's arguments as being based on ST's faulty claim construction requiring fixed programming pulses and "hot electron injection" programming. ³³⁹ The undersigned rejected ST's claim construction argument above. Therefore, ST's arguments are also rejected here and the undersigned finds that ST's accused products practice the first limitation of claim 1 of the '517 patent.

³³⁶ CIB 35 citing CFF 2312-32, 2338-39, 2350-81.

³³⁷ SIB 48 citing CX-2229C (Rhyne Direct) at 175-79, 223-24, 274-75.

³³⁸ RIB 29-44.

³³⁹ CIB 35; SIB 48-49.

c. Second Limitation (determining the threshold level ranges in which individual ones of said plurality of memory cells lie, and)

(1) ST NAND

SanDisk asserts that ST's NAND flash memories meet all the elements of the second limitation of claim 1 of the '517 patent because, [

] ³⁴⁰

Staff agrees with SanDisk that ST's accused NAND products infringe this claim limitation because [

341

]

³⁴⁰ CIB 36 citing CFF2382-2432, 2228-2273.

³⁴¹ SIB 50 citing Subramanian, Tr. 1378-81; SRB 25 citing CX-2229C (Rhyne Direct) at 181-83.

[342

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] ³⁴⁴

ST asserts that its accused NAND products do not perform the “determining” step because

[

]

³⁴² SIB 50-51 citing RX-2153C (Subramanian Rebuttal) at 250-58; Subramanian, Tr. 1378-81, 1471-84.

³⁴³ SRB 25.

³⁴⁴ SRB 26 citing Subramanian, Tr. 1471-84.

[

] ³⁴⁶

SanDisk counters ST's arguments, asserting that ST's own documents and witnesses contradict ST's argument. [

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] ³⁵⁰

ST counters Staff's arguments, asserting that Staff is mistaken as to how ST's accused NAND products assign bit values to cells. According to ST, ST chooses to design its NAND to be cheap and easy to manufacture. [

]

³⁴⁵ RIB 35-36 citing RX-2157C (Maccarrone Rebuttal) at A. 74, 84; RDX-139; RX-2153C (Subramanian Rebuttal) at A. 1252; Rhyne, Tr. 2020-22; Subramanian, Tr. 1406; RDX-172-002.

³⁴⁶ RIB 35-37.

³⁴⁷ CIB 36 citing Subramanian, Tr. 1148, 1307, 1377.

³⁴⁸ CRB 15-16 citing JX-66C (Mastrangelo Dep) at 54, 58.

³⁴⁹ CRB 16-17 citing CFF1054-1056.

³⁵⁰ CIB 36 citing CFF 2228-73, 2415-32; CRB 15-17.

[

] ³⁵²

The undersigned finds SanDisk's and Staff's arguments to be persuasive. Based on a review of the evidence, the undersigned finds that, [

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] ³⁵⁶ The majority of ST's arguments are based on their claim construction that the "determining" limitation requires measuring the threshold level of each cell, which was rejected above.

The undersigned does not, however, find SanDisk's "marginizing" arguments to be persuasive. As noted above, the undersigned rejected SanDisk's claim construction argument that the

³⁵¹ RRB 12 citing Subramanian, Tr. 1394; RX-1801C (Subramanian Direct) at A. 764-67; RDX-96.02, 96.03, 96.07.

³⁵² RRB 12 citing RX-2253 (Subramanian Rebuttal) at A. 1266 [check if 2153 or 2253].

³⁵³ Other factors that affect the read operation in ST's accused NAND products include mobility, oxide capacitance, channel width, and channel length RX-2157C (Maccarrone Rebuttal) at A. 80, p. 15.

³⁵⁴ Subramanian, Tr. 1406; RDX-172-2C; Rhyne, Tr. 1984-86.

³⁵⁵ RX-2153C (Subramanian Rebuttal) at 250-58; Subramanian, Tr. 1378-81, 1471-84.

³⁵⁶ See Section V(A)(2)(g).

“determining” limitation included “margin[ing].”³⁵⁷ Regardless of whether ST uses “margin[ing],” however, the undersigned finds that ST’s accused NAND products practice the “determining” limitation of claim 1 of the ‘517 patent.

Accordingly, the undersigned finds that ST’s accused NAND products practice the second limitation of claim 1 of the ‘517 patent.

(2) ST NOR

SanDisk asserts that ST’s NOR flash memories meet all the elements of the second limitation of claim 1 of the ‘517 patent because, [

] ³⁵⁸

[

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]

³⁵⁷ See Section V(A)(2)(g).

³⁵⁸ CIB 37 citing CFF2447-2563, 2285, 2298-99.

³⁵⁹ RIB 30 citing RX-2155C (Villa Direct) at a. 67, p. 12; RRB 12 citing Rhyne, Tr. 1949-50, 1954-56, 2390.

[

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] ³⁶³

Staff agrees with ST that [

] ³⁶⁴ According to Staff, this method does not appear to be the same, or the equivalent, to determining the threshold level ranges of the cell, as construed above. ³⁶⁵

SanDisk counters ST's arguments, asserting that ST is avoiding infringement by creating confusion regarding the [

366

]

³⁶⁰ RIB 32 citing Rhyne, Tr. 1917-18.

³⁶¹ RIB 33 citing RX-2153C (Subramanian Rebuttal) at A. 1257-60, p. 351-52; RDX-159.

³⁶² RIB 34 citing Subramanian, Tr. 1409-11; RDX-172-2C (*see also* Appendix D).

³⁶³ RIB 34 citing Rhyne, Tr. 1970, 1985, 2022, 2075.

³⁶⁴ SIB 48, 50 citing RX-2153C (Subramanian Rebuttal) at 349.

³⁶⁵ SIB 50.

³⁶⁶ CRB 17.

[]³⁶⁷

In addition, SanDisk asserts that the testimony of ST's experts contradicts ST's arguments.³⁶⁸

Specifically, SanDisk asserts that Dr. Subramanian admitted that in ST's NOR products, [

369

] ³⁷⁰ Alternatively, SanDisk asserts that ST's accused NOR products infringe by the doctrine of equivalents.³⁷¹

The undersigned agrees with ST and Staff that SanDisk has not shown, by a preponderance of evidence, that ST's accused NOR products, practice the "determining" limitation of claim 1 of the '517 patent. The evidence shows that ST's NOR chips determine the memory state of the cell

[]

³⁶⁷ CRB 19.

³⁶⁸ CIB 37 citing Subramanian, Tr. 1307.

³⁶⁹ CRB 17-18 citing CFF 2559-61, 2595-2613, 2624-36.

³⁷⁰ CRB 19 citing CFF 1054-56.

³⁷¹ CIB 37 citing CFF2503-2512, 2556-2563. Although SanDisk raises a doctrine of equivalents argument, the issue was not adequately briefed in the post-hearing brief or post-hearing reply brief. A single sentence alleging that the accused products infringe by the doctrine of equivalents, with a reference to more detailed arguments in the proposed findings of facts, is insufficient. Therefore, SanDisk's doctrine of equivalents argument is rejected. A reasonable page-limit for briefs was imposed on the parties in this investigation to narrow the number of issues that needed to be decided by the undersigned. The undersigned did not intend the parties to use the findings of facts for the arguments they chose not to elaborate on in their briefs.

[

] ³⁷² In addition, SanDisk’s “margining”

argument is also rejected, as the undersigned did not include such a requirement in the claim construction for “determining.”³⁷³

Accordingly, the undersigned finds that SanDisk has not proved, by a preponderance of the evidence, that ST’s accused NOR products practice the “determining” limitation of claim 1 of the ‘517 patent.

- d. Third Limitation (terminating said application of appropriate voltage conditions to individual ones of said plurality of memory cells upon their being determined to have reached desired threshold level ranges while continuing to apply said appropriate voltage conditions to others of said plurality of cells)**

SanDisk asserts that ST’s flash memories meet all the elements of the third limitation of claim 1 of the ‘517 patent because, [

374

] ³⁷⁵

ST asserts that its accused products do not infringe the “terminating” limitation based on its

³⁷² RX-2153C (Subramanian Rebuttal) at 349.

³⁷³ See Section V(A)(2)(g).

³⁷⁴ CIB 37 citing CFF2564-2648.

³⁷⁵ SIB 49 citing CX-2229C (Rhyne Direct) at 185-86, 226-28, 277-79.

claim construction because in all of its accused products, [

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] ³⁷⁸

Both SanDisk and Staff counter ST's arguments regarding the "terminating" limitation as being based on ST's faulty claim construction requiring preventing any further alternation of charge on the floating gate of an inhibited cell, *i.e.* that the cells must prevent program disturb.³⁷⁹ The undersigned rejected ST's claim construction argument above. Therefore, ST's arguments are also rejected here and the undersigned finds that ST's accused products practice the "terminating" limitation of claim 1 of the '517 patent.

Both SanDisk and Staff counter ST's arguments regarding the "continuing" limitation as being based on ST's faulty claim construction requiring applying the identical programming pulse

³⁷⁶ RIB 39 citing Rhyne, Tr. 2037-38; RX-2153C (Subramanian Rebuttal) at A. 1279-82, p. 358; RX-2155C (Villa Direct) at A. 96, p. 21; RX-2157C (Maccarrone Rebuttal) at A. 92-94, p. 14-18; RRB 14-15.

³⁷⁷ RRB 14.

³⁷⁸ RIB 38 citing RX-2153C (Subramanian Rebuttal) at A. 1223-24, p. 340-41; RX-2155C (Villa Direct) at A.112, p. 24; RX-2156C (Sali Direct) at A. 43, p. 6; RX-2157C (Maccarrone Rebuttal) at A. 86, p. 16; RRB 11-12.

³⁷⁹ CRB 20; SIB 49; SRB 23.

during each successive pulse of a program operation.³⁸⁰ The undersigned rejected ST's claim construction argument above. Therefore, ST's arguments are also rejected here and the undersigned finds that ST's accused products practice the "continuing" limitation of claim 1 of the '517 patent.

Accordingly, the undersigned finds that ST's accused products practice the third limitation of claim 1 of the '517 patent.

e. Fourth Limitation (until all of the plurality of cells are determined to have reached their desired threshold level ranges)

SanDisk asserts that ST's flash memories meet all the elements of the fourth limitation of claim 1 of the '517 patent because [

] ³⁸¹ Staff agrees with SanDisk that ST's accused products meet all the elements of the fourth limitation.³⁸²

ST asserts that its accused NAND products do not perform this limitation because [

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]

³⁸⁰ CRB 19 citing CFF 771, 2582-85; SRB 23.

³⁸¹ CIB 38 citing CFF 2649-2686.

³⁸² SIB 49 citing CX-2229 (Rhyne Direct) at 186-88, 228-29, 279-80.

³⁸³ RIB 29-30 citing Rhyne, Tr. 1763-64; RRB 11.

³⁸⁴ RRB 15.

[

] ³⁸⁵

Both SanDisk and Staff counter ST's arguments as being based on faulty claim construction of what constitutes a desired range.³⁸⁶ The undersigned rejected ST's claim construction argument above. Therefore, ST's arguments are also rejected here and the undersigned finds that ST's accused products practice the fourth limitation of claim 1 of the '517 patent.

f. Conclusion

Accordingly, the undersigned finds that SanDisk has proved, by a preponderance of the evidence that ST's accused NAND products infringe each and every limitation of claim 1 of the '517 patent. The undersigned finds, however, that SanDisk has not proved, by a preponderance of the evidence, that ST's accused NOR products infringe each and every limitation of claim 1 of the '517 patent.

2. Claim 3 (The method of claim 1, wherein there are more than two threshold level ranges)

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 3 of the '517 patent because [387

388

]

³⁸⁵ RRB 15 citing RX-2155C (Villa Rebuttal) at A. 143; RFF1426-31.

³⁸⁶ CIB 38; CRB 20; SIB 49.

³⁸⁷ CIB 38 citing CFF 2687-2693.

³⁸⁸ RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1383-1428, p. 380-86; RRB 15.

[

]³⁸⁹

As ST has not provided any additional arguments other than the ones proposed above for claim 1, which were rejected above, the undersigned finds that ST's accused MLC NAND products also infringe dependent claim 3 of the '517 patent.

3. Claim 5 (The method of claim 1, wherein the threshold level ranges are separated by more than one breakpoint threshold level, thereby to provide more than two non-overlapping threshold level ranges)

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 5 of the '517 patent because [

]³⁹⁰ ST asserts that, as claims 3, 5, 6, 7, 8, 10, and 11 depend from claim 1, its accused products do not infringe this dependent claim for the same reasons claim 1 is not infringed.³⁹¹ Staff asserts that ST does not contend that the accused chips do not satisfy the additional limitations in claim 5; therefore, any version of ST's F90 4Gb MLC NAND chips that infringe claim 1 also infringe claim 5.³⁹²

As ST has not provided any additional arguments other than the ones proposed above for claim 1, which were rejected above, the undersigned finds that ST's accused MLC NAND products also infringe dependent claim 5 of the '517 patent.

4. Claim 6 (The method of claim 1, wherein said desired threshold level ranges include an erased threshold level range)

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 6 of the

³⁸⁹ SIB 51; SRB 26.

³⁹⁰ CIB 38 citing CFF 2694-99.

³⁹¹ RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1383-1428, p. 380-86; RRB 15.

³⁹² SIB 51; SRB 26.

'517 patent because [

] ³⁹³

ST asserts that, as claims 3, 5, 6, 7, 8, 10, and 11 depend from claim 1, its accused products do not infringe this dependent claim for the same reasons claim 1 is not infringed.³⁹⁴ In addition, ST asserts that its accused products do not practice the additional limitation in claim 6 because [

395

]

Staff counters ST's arguments regarding claim 6 as being based on incorrect claim construction. According to Staff, all that claim 6 requires is single or multi-level cells with an erased range. Therefore, Staff asserts that claim 6 is infringed by all of ST's accused NAND products.³⁹⁶

The undersigned agrees with SanDisk and Staff that claim 6 covers single level cells with an erased range, which is consistent with the claim construction adopted above.³⁹⁷ As ST has not provided any other arguments, which have already been rejected above, the undersigned finds that ST's accused NAND products also infringe dependent claim 6 of the '517 patent.

³⁹³ CIB 39 citing CFF 2700-04.

³⁹⁴ RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1383-1428, p. 380-86.

³⁹⁵ RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1399-1403, p. 382-84; Rhyne, Tr. 1765.

³⁹⁶ SIB 51-52 citing CX-2229C (Rhyne Direct) at 190-91, 231-32, 281-82; SRB 26.

³⁹⁷ *See supra*, section V(A)(2)(j); CX-2229C (Rhyne Direct) at 190-91, 231-32, 281-82.

5. **Claim 7 (The method of claim 1, wherein the array of memory cells are grouped into blocks of cells wherein the threshold levels of cells within a selected one of the blocks are changed together to a single given threshold level range prior to applying said appropriate voltage conditions in parallel to the plurality of cells within said one block)**

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 7 of the '517 patent because [

] ³⁹⁸ ST asserts that, as claims 3, 5, 6, 7, 8, 10, and 11 depend from claim 1, its accused products do not infringe this dependent claim for the same reasons claim 1 is not infringed. ³⁹⁹ Staff asserts that ST does not contend that the accused chips do not satisfy the additional limitations in claim 7; therefore, any products that infringe claim 1 also infringe claim 7. ⁴⁰⁰

As ST has not provided any additional arguments other than the ones proposed above for claim 1, which were rejected above, the undersigned finds that ST's accused NAND products also infringe dependent claim 7 of the '517 patent.

6. **Claim 8 (The method of claim 7, wherein individual ones of said blocks include a specific number of memory cells and said plurality of memory cells to which said appropriate voltage conditions are applied in parallel are less than said specific number, and additionally comprising repeating for another plurality of cells within said one block said applying, determining and terminating operations)**

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 8 of the '517 patent [

] ⁴⁰¹ ST asserts that, as claims 3, 5, 6, 7, 8, 10, and 11 depend from claim 1, its accused products do not infringe this

³⁹⁸ CIB 39 citing CFF2705-39.

³⁹⁹ RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1383-1428, p. 380-86; RRB 15.

⁴⁰⁰ SIB 52; SRB 26.

⁴⁰¹ CIB 39 citing CFF 2740-51.

dependent claim for the same reasons claim 1 is not infringed.⁴⁰² Staff asserts that ST does not contend that the accused chips do not satisfy the additional limitations in claim 8; therefore, any products that infringe claim 1 also infringe claim 8.⁴⁰³

As ST has not provided any additional arguments other than the ones proposed above for claim 1, which were rejected above, the undersigned finds that ST's accused NAND products also infringe dependent claim 8 of the '517 patent.

7. Claim 10 (The method of any one of claims 1-9, carried out on a single integrated circuit chip)

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 10 of the '517 patent because[]⁴⁰⁴

ST asserts that, as claims 3, 5, 6, 7, 8, 10, and 11 depend from claim 1, its accused products do not infringe this dependent claim for the same reasons claim 1 is not infringed.⁴⁰⁵ Staff asserts that ST does not contend that the accused chips do not satisfy the additional limitations in claim 10; therefore, any products that infringe claim 1 also infringe claim 10.⁴⁰⁶

As ST has not provided any additional arguments other than the ones proposed above for claim 1, which were rejected above, the undersigned finds that ST's accused NAND products also infringe dependent claim 10 of the '517 patent.

⁴⁰² RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1383-1428, p. 380-86; RRB 15.

⁴⁰³ SIB 52; SRB 26.

⁴⁰⁴ CIB 39 citing CFF 2752-56.

⁴⁰⁵ RIB 39 citing RX-2153 (Subramanian Rebuttal) at A. 1383-1428, p. 380-86; RRB 15.

⁴⁰⁶ SIB 52; SRB 26.

8. Claim 12 (The method of claim 1 wherein the desired ones of said threshold level ranges reached by applying appropriate voltage conditions to the plurality of memory cells correspond to a chunk of input data being programmed into the memory system)

SanDisk asserts that ST's flash memories meet all the elements of dependent claim 12 of the '517 patent because, [

] ⁴⁰⁷

ST asserts that its products do not infringe claim 12 for same reasons it does not infringe claim 1. In addition, ST asserts that its accused products do not program a "chunk of input data" into memory cells because [

] ⁴⁰⁸

Staff agrees with ST that ST's accused NAND products do not practice the additional limitation in claim 12 because ST's NAND products do not store a "chunk of data." Staff agrees that ST's NAND products use [] to indicate whether the cell should be programmed. According to Staff, the use of [] is substantially different from suing a "chunk of input data."⁴⁰⁹ Staff asserts that this was also the conclusion reached by Judge Luckern in the 526 investigation.⁴¹⁰

SanDisk counters both ST's and Staff's arguments. SanDisk asserts that both ST and Staff are confusing the "means for temporarily storing" element in claim 27 of the '338 patent, with the requirements in claim 12 of the '517 patent. According to SanDisk, claim 12 of the '517 patent has no requirement that the EEprom system store the "chunk of input data." Rather, SanDisk asserts that

⁴⁰⁷ CIB 39 citing CFF 2757-2817.

⁴⁰⁸ RIB 40 citing CX-372C (the 526 ID) at 77; RX-2153C (Subramanian Rebuttal) at A. 1434-58, p. 387-98; RX-2157C (Maccarrone Direct) at A. 105-07, p. 19; Rhyne, Tr. 2042-45, 2142-45; RX-2155C (Villa Direct) at A. 137-41, p. 29-30; RX-2156 (Sali Direct) at A. 32-39, p. 4-6; CX-32C (W8DL design review) at 41560; RX-1670C (W9EL design review) at ST560 41952; RRB 15.

⁴⁰⁹ SIB 52 citing RX-2153C (Subramanian Direct) at 395-98; SRB 26-27.

⁴¹⁰ SIB 52 citing CX-372C (the 526 ID) at 67-75 (use of status flags in ST's NAND did not satisfy the "means for temporarily storing a chunk of data" limitation).

the claim only requires that the “desired threshold level ranges reached by applying appropriate voltage conditions” correspond “to a chunk of input data being programmed into the memory system []⁴¹¹ Alternatively, SanDisk asserts that, even if ST’s accused products use [] ST’s products infringe under the doctrine of equivalents.⁴¹²

The undersigned agrees with ST’s and Staff’s arguments that claim 12 requires that a “chunk of input data” be programmed into memory cells and that ST’s products [] which is not the same,⁴¹³ nor the equivalent.⁴¹⁴ This is consistent with the finding made in the 526 investigation.⁴¹⁵ While SanDisk argues that the ‘517 patent does not require that the “chunk of input data” be stored as was required by the ‘338 patent, and that the ‘517 only requires a “correspondence,” SanDisk has not shown that there is such a “correspondence” by a preponderance of the evidence.

Accordingly, SanDisk has not shown, by a preponderance of the evidence, that ST’s accused products infringe each and every limitation of claim 12 of the ‘517 patent.

⁴¹¹ CRB 20-21 citing CX-99/RX-2 (the ‘517 patent) at col. 31:40-44.

⁴¹² CIB 40 citing CFF 2788-2791.

⁴¹³ RX-2153C (Subramanian Rebuttal) at A. 1434-58, p. 387-98; RX-2157C (Maccarrone Direct) at A. 105-07, p. 19; Rhyne, Tr. 2042-45, 2142-45; RX-2155C (Villa Direct) at A. 137-41, p. 29-30; RX-2156 (Sali Direct) at A. 32-39, p. 4-6; CX-32C (W8DL design review) at 41560; RX-1670C (W9EL design review) at ST560 41952.

⁴¹⁴ SanDisk’s doctrine of equivalents analysis is rejected. *See* footnote 371.

⁴¹⁵ CX-372C (the 526 ID) at 77.

9. Claim 13 (The method of claim 12, wherein the plurality of cells are determined to have reached the desired threshold level ranges by comparing the threshold levels of the plurality of cells with the chunk of input data)

SanDisk asserts that ST's [] flash memory meets all the elements of dependent claim 13 of the '517 patent.⁴¹⁶

ST asserts that SanDisk waived asserting claim 13 against ST's NAND products, because the issue was not preserved in SanDisk's pre-hearing brief.⁴¹⁷ As for ST's NOR products, ST asserts that its products do not infringe for same reasons claims 1 and 12 do not infringe. Specifically, ST asserts that, based on its claim construction of the "determining" limitation, ST's accused products [

418

] ⁴¹⁹

Staff agrees with ST that ST's accused NAND products do not practice the additional limitation in claim 13 because [] as discussed above in claim 12.⁴²⁰

The undersigned determined above that SanDisk failed to prove, by a preponderance of the evidence, that ST's accused products infringe claim 12 of the '517 patent. Therefore, because claim 13 depends from claim 12, the undersigned finds that ST's accused products also do not infringe claim 13 of the '517 patent.

⁴¹⁶ CIB 40 citing CFF 2818-22; CRB 20.

⁴¹⁷ RIB 40 citing SanDisk's Prehearing Brief 247-48 and Ground Rule 8.2.

⁴¹⁸ RIB 40 citing RX-2153C (Subramanian Rebuttal) at A. 1464-78, p. 398-402.

⁴¹⁹ RIB 41 citing Rhyne, Tr. 2142-43; RRB 16.

⁴²⁰ SIB 52; SRB 26-27.

10. Claim 14 (The method of claim 13, wherein the chunk of input data is stored in a cache memory prior to being programmed into memory cells within the EEprom)

SanDisk asserts that ST's [] flash memory meets all the elements of dependent claim 14 of the '517 patent.⁴²¹

ST asserts that SanDisk waived asserting claim 14 against ST's NAND products, because the issue was not preserved in SanDisk's pre-hearing brief.⁴²² As for ST's NOR products, ST asserts that its products do not infringe for same reasons claims 1, 12, and 13 do not infringe. Specifically, ST asserts that, based on its claim construction of the "cache memory" limitation, this claim requires a memory used to insulate the flash memory device from enduring too many program/erase cycles allowing data to be operated on several times in the cache before being committed to the flash memory. ST asserts that Dr. Rhyne conceded that ST's [

] ⁴²³ In addition, ST asserts that its[

] ⁴²⁴

Staff agrees with ST that ST's accused NAND products do not practice the additional limitation in claim 14 because ST's NAND products [] as discussed above in claim 12.⁴²⁵

The undersigned does not find ST's argument persuasive, as the undersigned did not adopt ST's claim construction for "cache memory." The undersigned determined above, however, that

⁴²¹ CIB 40 citing CFF 2823-24; CRB 20.

⁴²² RIB 41 citing SanDisk's Prehearing Brief 248-49 and Ground Rule 8.2.

⁴²³ RIB 41 citing RX-2153C (Subramanian Rebuttal) at A. 1485, p. 402-03; CX-2229C (Rhyne Direct) at p. 286.

⁴²⁴ RIB 41 citing RX-1664C (W8DL design review) at ST560 41567-68; RX-2153C (Subramanian Direct) at A. 1492, p. 403-04.

⁴²⁵ SIB 52; SRB 26-27.

SanDisk failed to prove, by a preponderance of the evidence, that ST's accused products infringe claim 12 of the '517 patent. Therefore, because claim 14 depends from claim 12, the undersigned finds that ST's accused products also do not infringe claim 14 of the '517 patent.

11. Indirect Infringement

a. Induced Infringement

SanDisk asserts that ST induces infringement of the '517 patent. First, SanDisk asserts that ST knew of the '517 patent since at least October 2005. Second, SanDisk asserts that there is substantial evidence of direct infringement by ST's customers.⁴²⁶ SanDisk asserts that ST intended to cause the acts which constitute infringement because ST intended the accused products to be programmed and erased during normal use, qualification, and/or testing. SanDisk asserts that it is reasonable to infer that ST intends the ordinary use to occur and has taken active steps to encourage the use of its accused products in which those flash memories will be programmed, and in most cases, later erased and reprogrammed. According to SanDisk, ST markets its products for use in cell phones, removable storage media, set-top boxes, etc., and that ST instructs its customers how to design their products to perform the infringing commands.⁴²⁷

As to ST's MLC NOR products, SanDisk asserts that ST advertises these chips for use in storing data, as well as code, in cell phones.⁴²⁸ As to ST's NAND products, SanDisk asserts that ST advertises these chips as advantageous for applications that store code because the memory can be

⁴²⁶ CIB 41 citing CFF 3332-83.

⁴²⁷ CIB 41 citing CFF 3384-90.

⁴²⁸ CIB 41-42 citing CX-867 (ST website) at SDITC-II-153467; CX-868 (press release) at SDITC-II-168949; CX-2229C (Rhyne Direct) at Q. 1468.

erased and programmed.⁴²⁹ According to SanDisk, ST informs its customers on how to use the accused products to perform the commands which infringe the '517 patent, that is to be programmed, erased, and then re-programmed. Therefore, according to SanDisk, ST intends to cause the acts which constitute infringement.⁴³⁰

Staff agrees with SanDisk that ST's sale of flash memory chips indirectly infringe the asserted claims of the '517 patent.⁴³¹ Staff asserts that ST learned of the '517 patent, at the latest, when the complaint was filed, and that ST continued to produce and import the accused chips.⁴³² According to Staff, ST produces and sells flash memory cards and currently has approximately 100,000 in inventory in the United States. Staff asserts that the ordinary use of a flash memory card involves programming, and sometimes erasing, the card.⁴³³ In addition, Staff asserts that ST sells its chips to customers who incorporate them into other products, such as USB drives, and provides instructions to its customers on how to use the chips.⁴³⁴ Based on the above, Staff asserts that there is evidence of induced infringement.⁴³⁵

ST asserts that SanDisk has failed to prove an act of direct infringement by any third party or that ST was even aware of a single act of direct infringement by a third party.⁴³⁶ According to ST:

⁴²⁹ CIB 43 citing CX-827 (application note) at SDITC-II-153709.

⁴³⁰ CIB 42 citing CFF 3339, 3342-49, 3368, 3379, 3384-85, 3391, 3395-98, 3400, 3416-19, 3421-22, 3426.

⁴³¹ SIB 53-54.

⁴³² SIB 53 citing Casagrande, Tr. 1513-14; ST's Response to Second Amended Complaint at 1.

⁴³³ SIB 53 citing CX-2229C (Rhyne Direct) at 391; Casagrande, Tr. 1510; Napper, Tr. 961.

⁴³⁴ SIB 53 citing Subramanian, Tr. 1370-71; CX-2229C (Rhyne Direct) at 392-99, 401-07.

⁴³⁵ SIB 53 citing *Golden Blount, Inc. v. Robert H. Peterson Co.*, 438 F.3d 1354, 1362-63 (Fed. Cir. 2006) ("*Golden Blount*"); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1272, (Fed. Cir. 1986) ("*Moleculon*").

⁴³⁶ RIB 43-44; RRB 17-18.

1) its flash memories alone cannot infringe the '517 patent;⁴³⁷ 2) it does not know into what products its customers may or may not integrate ST flash memory and does not know how, if at all, ST flash memory might be used in any particular customer's product;⁴³⁸ 3) when a customer buys an ST chip, it is the customer who decides what controller to use and what commands that controller can issue to the ST chip;⁴³⁹ 4) it has no knowledge, provides no assistance, and plays no role whatsoever in what distributors do after they purchase memory from ST;⁴⁴⁰ 5) its memories are commodity goods and memory customers design their product specifications before ever purchasing a memory product from ST;⁴⁴¹ and 6) it has never even suggested or encouraged any U.S. customer to perform any particular operation on an ST memory.⁴⁴²

SanDisk counters ST's arguments that SanDisk has failed to prove an act of direct infringement by a third party. According to SanDisk, the evidence shows direct acts of infringement in the U.S. by products that use the accused chips and that ST knew and promoted acts that constitute direct infringement.⁴⁴³

Staff also counters ST's arguments relying on *DSU* for the proposition that because it does not know how its customers use its chips, no specific intent can be found. According to Staff, at the very least, ST itself sells flash memory cards and it certainly knows that its own products operate in

⁴³⁷ RIB 43 citing Rhyne, Tr. 1732-33, 2047-49, 2052.

⁴³⁸ RIB 43 citing JX-5C (Matte Dep) at 47, 50-51, 92-93, 192-94, 210; JX-141C (Ponzanelli Dep) at 56, 110-11; JX-144C (Zhang Dep) at 132-33; JX-140C (Peyret Dep) at 73, 77-78, 126-27.

⁴³⁹ RIB 43 citing Rhyne, Tr. 2050-51, 2058.

⁴⁴⁰ RIB 43 citing JX-33C (Shopes Dep) at 44-45; JX-28C (Pecoraro Dep) at 69-70.

⁴⁴¹ RIB 43-44 citing JX-32C (Sheen Dep) at 102.

⁴⁴² RIB 44 citing Rhyne, Tr. 2068-70.

⁴⁴³ CRB 23 citing CFF3342-83, 3384-400, 3333, 3358, 3416-22, 3426, 3339-3449, 3395-98; CX-867 (ST website) at SDITC-II-153467; CX-868 (press release) at SDITC-II-168949; CX-2229C (Rhyne Direct) at A. 1468.

accordance with its own specification.⁴⁴⁴ With respect to ST's other products, Staff asserts that there is significant evidence that ST's customers use the chips as set out in ST's data sheets.⁴⁴⁵ Therefore, Staff asserts that this is a case where the product is intended to be used in a particular way, which is taught by the proffered instructions and which, when used, practices the claimed method.⁴⁴⁶

The required elements of a claim of induced infringement are: “(1) an act of direct infringement; (2) the accused infringer actively induced a third party to infringe the patent; and (3) the accused infringer knew or should have known that his actions would induce infringement.”⁴⁴⁷ As for intent, it can be shown through circumstantial evidence.⁴⁴⁸

As to ST's accused NOR products, the undersigned did not find an act of direct infringement, which is required for the purposes of finding induced infringement. Accordingly, the undersigned finds that SanDisk has failed to prove that ST's accused NOR products induce infringement of the '517 patent.

As to ST's accused NAND products, the undersigned finds that the evidence shows that there has been an act of direct infringement, that ST actively induced third parties to infringe the patent, and that ST knew or should have known that its actions would induce infringement. ST learned of the '517 patent, at the latest, when this complaint was filed on January 10, 2006, and that ST continued to produce and import the accused chips, which includes a large inventory of chips in the

⁴⁴⁴ SRB 27 citing CX-2229C (Rhyne Direct) at 157-61, 391.

⁴⁴⁵ SRB 27 citing CFF 3450-3717.

⁴⁴⁶ SRB 27.

⁴⁴⁷ *Certain Flash Memory Circuits*, Comm'n Op. at 16.

⁴⁴⁸ *LaBounty*, 958 F.2d at 1076 (“[d]irect proof of wrongful intent is rarely available but may be inferred from clear and convincing evidence of the surrounding circumstances.”); *Bristol-Myers*, 326 F.3d at 1239; *GFI Inc. v. Franklin Corp.*, 265 F.3d 1268, 1274 (Fed. Cir. 2001) (“*GFP*”); *Merck & Co. v. Danbury Pharmacal, Inc.*, 873 F.2d 1418, 1422 (Fed. Cir. 1989) (“*Danbury*”).

United States.⁴⁴⁹ The ordinary use of a flash memory card involves programming, erasing, and reprogramming the flash memory card.⁴⁵⁰ ST itself produces flash memory cards and it also sells chips to customers who incorporate them into other products. While ST argues that it does not know what its customers do with the flash memory chips and that it is the customer who decides what controller to use with the chip, the evidence shows that ST's customers use the chips as set out in ST's data sheets and perform in the way they were intended to be used. Based on the above, the undersigned finds that SanDisk has proved that there is evidence of induced infringement with respect to ST's accused NAND products.

b. Contributory Infringement

SanDisk asserts that ST's accused products contributorily infringe the asserted claims of the '517 patent. SanDisk asserts that ST has known of the '517 patent since at least October 2006, when ST filed a complaint discussing the 07/337,566 application, from which the '517 patent ultimately issued. According to SanDisk, ST knows that, during ordinary use, products containing ST's accused products directly infringe various method claims of the '517 patent. ST asserts that each of the accused ST products is sold for use in practicing the patented method claims, and, in operation, practices a material part of the claimed method. According to SanDisk, ST specifically designs its accused products to be programmed, erased, and reprogrammed.⁴⁵¹

SanDisk asserts that there are no substantial non-infringing uses for the accused flash memory products because an accused ST product that is in the U.S. and includes flash memory is highly likely to be reprogrammed in the U.S. at some point, even if it was originally programmed

⁴⁴⁹ Casagrande, Tr. 1513-14; ST's Response to Second Amended Complaint at 1.

⁴⁵⁰ CX-2229C (Rhyne Direct) at 391; Casagrande, Tr. 1510; Napper, Tr. 961.

⁴⁵¹ CIB 40-41 citing CFF 3340-41, 3329.

outside the U.S.⁴⁵²

Staff agrees with SanDisk that ST contributorily infringes the ‘517 patent.⁴⁵³ According to Staff, the ordinary purpose of a flash memory is to be programmed and erased, which is true for flash cards, as well as USB drives.⁴⁵⁴ Therefore, Staff asserts that there are no substantial non-infringing uses and that SanDisk has met its burden of showing indirect infringement.⁴⁵⁵ In addition, Staff notes that, while ST argues that SanDisk has failed to show a specific instance of direct infringement, such infringement can be shown through circumstantial evidence.⁴⁵⁶

ST asserts that SanDisk has failed to meet its burden to prove contributory infringement because SanDisk has failed to demonstrate a specific instance of direct infringement to which ST’s U.S. acts contributed and that ST’s chips, standing alone, cannot infringe the ‘517 patent. According to ST, Dr. Rhyne conceded that there was no evidence of ST telling any manufacturer or user of a product incorporating ST’s chips to issue a program command to the ST chip.⁴⁵⁷ ST also asserts that Dr. Rhyne conceded that ST’s flash memory chips have substantial non-infringing uses, such as being used to store software code in consumer electronics products, such as [

] According to ST, customers load software into ST’s memory during the manufacture of consumer goods outside the U.S.; therefore, there can be no infringement.⁴⁵⁸

⁴⁵² CIB 41 citing CFF 3328-41, 3343-83.

⁴⁵³ SIB 54.

⁴⁵⁴ SIB 54 citing CX-2229C (Rhyne Direct) at 387-88; Subramanian, Tr. 1370-71; Harari, Tr. 286-87.

⁴⁵⁵ SIB 54 citing *Aquatex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1379, n. ** (Fed. Cir. 2005) (“*Aquatex*”); SRB 28.

⁴⁵⁶ SRB 28.

⁴⁵⁷ RIB 41 citing Rhyne, Tr. 2047-48, 2068-69; RRB 16-17.

⁴⁵⁸ RIB 42 citing Rhyne, Tr. 2055-56, 2060; [] at 110-14; [] at 107-10; *DSU Med. Corp. v. JMS Co. Ltd.*, 471 F.3d 1293, 1303-04 (Fed. Cir. 2006) (“*DSU*”) (continued...)

SanDisk counters ST's arguments that SanDisk has failed to show a specific instance of direct infringement to which ST's U.S. acts contributed. According to SanDisk, the record shows that ST contributed to acts of infringement of the '517 patent in the U.S.⁴⁵⁹ SanDisk also counters ST's argument that a "read" operation constitutes a substantial non-infringing use. According to SanDisk, ST's argument ignores the fact that devices containing ST chips will be programmed in the U.S. and that the overwhelming evidence shows that an accused ST product that is in the U.S. and includes flash memory is likely to be reprogrammed in the U.S. at some point, even if it was originally programmed outside the U.S.⁴⁶⁰

ST counters SanDisk's arguments. According to ST, SanDisk's arguments merely confirm that ST's flash memories need not be reprogrammed in the U.S.; therefore, they have substantial non-infringing uses.⁴⁶¹ In addition, ST argues that SanDisk has not proven that ST knew of the '517 patent at the time when it supposedly engaged in contributory conduct. ST argues that SanDisk's mention of a parent application up the chain from the application leading the '517 patent does not show that ST knew the '517 patent existed.⁴⁶²

The undersigned finds SanDisk's and Staff's arguments persuasive. The evidence shows that the ordinary use of a flash memory involves being programmed, erased, and reprogrammed, which is true for flash memory cards and USB drives.⁴⁶³ Therefore, there are no substantial non-infringing

⁴⁵⁸(...continued)
("Section 271(c) has a territorial limitation requiring contributory acts to occur in the United States.")

⁴⁵⁹ CRB 23 citing CFF 3325-83.

⁴⁶⁰ CRB 23 citing CFF3328-41, 3343-83.

⁴⁶¹ RRB 16 citing Rhyne, Tr. 2061.

⁴⁶² RRB 17.

⁴⁶³ CX-2229C (Rhyne Direct) at 387-88; Subramanian, Tr. 1370-71; Harari, Tr. 286-87.

uses for these types of devices. Because there are no substantial non-infringing uses, SanDisk has met its burden of showing contributory infringement.

C. Domestic Industry

1. Technical Prong

SanDisk asserts that it sells a wide variety of NAND products that are protected by the ‘517 patent.⁴⁶⁴ According to SanDisk, its NAND products are mass storage devices and are used in a variety of applications for storing data. SanDisk asserts that its products include one or more NAND flash memory chips under the control of a controller chips and practices claims 1, 3, 5, 6, 10, and 12 of the ‘517 patent during programming. SanDisk also asserts that its products practice claims 7 and 8 of the ‘517 patent by erasing an entire block of memory cells at the same time and then programming a subset of cells within that block. The parties agree that, during normal use, SanDisk’s NAND products perform program and erase operations and that SanDisk’s NAND products perform these operations when SanDisk tests its products in the U.S.⁴⁶⁵ Staff agrees that, based on SanDisk’s expert’s testimony, SanDisk’s NAND flash memory products are covered by claims 1, 3, 5, 6, 7, 8, 10, and 12 of the ‘517 patent.⁴⁶⁶

ST agrees that SanDisk’s [] is representative of the NAND Flash chips upon which SanDisk relies to meet the domestic industry requirement for the ‘517 patent. In addition, ST agrees that this representative chip can operate either as a binary or MLC device.⁴⁶⁷

⁴⁶⁴ CIB 50 citing CX-902C (sample NAND products).

⁴⁶⁵ CIB 50.

⁴⁶⁶ SIB 58 citing CX-2229C (Rhyne Direct) at 313-54; SRB 30.

⁴⁶⁷ RIB 55 citing CX-2227C (Quader Direct) at A. 33, p. 7; RX-2153C (Subramanian (continued...))

a. Claim 1

SanDisk asserts that its NAND products meet all the elements and practices all of the steps of claim 1 of the '517 patent whenever a programming operation is performed.⁴⁶⁸ As to the preamble, SanDisk asserts that there is no dispute that SanDisk's NAND products are EEPROM systems with floating gate memory cells, that the charge level of the floating gate of each cell is alterable in response to appropriate voltage conditions applied to the cell in order to set a variable threshold level, and that its products read, and determine the state of each cell.⁴⁶⁹ ST does not dispute that SanDisk's NAND products practice the preamble of claim 1 of the '517 patent.

As to the "said appropriate voltage conditions" limitation of claim 1, SanDisk asserts that there is no dispute that SanDisk's NAND products apply a series of programming pulses, in parallel, to a plurality of memory cells and that, unless a cell is inhibited, each programming pulse will alter the cell's charge level.⁴⁷⁰ ST argues that under its proposed claim construction—that claim 1 is limited to fixed pulse programming—[

]⁴⁷¹ Both SanDisk and Staff counter ST's arguments as being based on ST's faulty claim construction.⁴⁷²

The undersigned rejected ST's claim construction argument above. Therefore, ST's arguments are also rejected here and the undersigned finds that SanDisk's NAND products practice the "said appropriate voltage conditions" limitation of claim 1 of the '517 patent.

⁴⁶⁷(...continued)
Rebuttal) at A. 1857, p. 498.

⁴⁶⁸ CIB 50-53.

⁴⁶⁹ CIB 50-51.

⁴⁷⁰ CIB 51.

⁴⁷¹ RIB 55 citing RX-2153C (Subramanian Rebuttal) at A. 1893, p. 505; RRB 19-20.

⁴⁷² CRB 24; SIB 58 citing CX-2229C (Rhyne Direct) at 328; SRB 30-31.

As to the “determining” limitation of claim 1, SanDisk asserts that during program operation, SanDisk’s NAND products use a verify operation to determine, on a cell-by-cell basis, the present state of each memory cell undergoing programming. According to SanDisk, the parties agree that during the verify operation, SanDisk’s NAND products use a sense amplifier circuit to identify the present state of each cell by sensing the voltage of the cell’s bitline.⁴⁷³ SanDisk asserts that its products determine the threshold voltage range in which individual cells lie.⁴⁷⁴

ST asserts that SanDisk’s products do not perform the “determining” step because SanDisk’s NAND products [] In other words, ST asserts that SanDisk’s products []

Therefore, according to ST, SanDisk’s products do not practice the “determining” limitation for the same reason that ST’s products do not practice the “determining” limitation.⁴⁷⁵

Both SanDisk and Staff counter ST’s arguments. SanDisk counters that ST’s arguments are belied by the following facts: that the only parameter SanDisk’s NAND products intentionally alter during programming is the charge level of the cell, *i.e.* the threshold voltage; during a program-verify operation, whether or not the bitline discharges is predominantly based on the cell’s threshold voltage; and SanDisk takes manufacturing variability into account during a program-verify operation by leaving enough time for the bitline to discharge when the cell is “on,” *i.e.* erased.⁴⁷⁶

⁴⁷³ CIB 51-52.

⁴⁷⁴ CIB 52.

⁴⁷⁵ RIB 55 citing Quader, Tr. 589-90; RRB 20.

⁴⁷⁶ CRB 24.

Staff counters that SanDisk's expert testified that, in SanDisk's NAND products, the method of verifying whether the cells are programmed uses the bitline discharge method to read the cells and satisfies this limitation through determining whether the cells being read are in an erased state (in which case it conducts, or is above the threshold voltage), or in the programmed state (in which case it does not conduct).⁴⁷⁷ Staff asserts that ST's expert did not provide any testimony concerning this limitation.⁴⁷⁸ In addition, Staff asserts that, while ST contended there is manufacturing variability in the parts that allow for different results even if the cells have the same threshold voltage, SanDisk's witness testified that the key factor is the threshold voltage and that SanDisk takes manufacturing variability into account.⁴⁷⁹

ST counters SanDisk's and Staff's arguments, asserting that Dr. Quader acknowledged that

[

] ⁴⁸⁰

The undersigned finds SanDisk and Staff's arguments persuasive. While there is evidence that SanDisk's NAND products have manufacturing variability that can affect the memory state of the cells, the evidence shows that SanDisk's NAND products filter out manufacturing variability so that each cell's threshold level range is accurately determined during a program-verify operation.⁴⁸¹ Accordingly, the undersigned finds that SanDisk's NAND products practice the "determining"

⁴⁷⁷ SIB 58-59 citing CX-2229C (Rhyne Direct) at 331-38; SRB 31.

⁴⁷⁸ SIB 59 citing RX-2153C (Subramanian Rebuttal) at 504-07; Subramanian, Tr. 1374; SRB 31.

⁴⁷⁹ SIB 59 citing Quader, Tr. 581-82, 663, 695-712; SRB 31.

⁴⁸⁰ RRB 20 citing Quader, Tr. 603, 619.

⁴⁸¹ Quader, Tr. 581-82, 663, 695-712; CX-1378C (Toshiba/SanDisk NAND Flash Memory Design) at SDITC 325024.

limitation of claim 1 of the '517 patent.

As to the “terminating” limitation of claim 1, SanDisk asserts that its NAND products apply a programming pulse to a plurality of addressed memory cells in parallel, verify whether, on a cell-by-cell basis, the addressed memory cells have reached their desired states, inhibit the verified cells for the remainder of the programming operation, and continue to program, verify, and inhibit until all the plurality of addressed cells are verified.⁴⁸² ST asserts that SanDisk’s NAND products do not practice the “terminating” step because the products are subject to program disturb during which electrons can be added to the floating gate of an inhibited memory cell, thereby altering the floating gate’s charge level. Therefore, according to ST, SanDisk’s products do not practice the “terminating” limitation for the same reason that ST’s products do not practice the “terminating” limitation.⁴⁸³ Both SanDisk and Staff counter ST’s arguments as being based on ST’s faulty claim construction.⁴⁸⁴ The undersigned rejected ST’s claim construction argument for this claim limitation above. Therefore, ST’s arguments are also rejected here and the undersigned finds that SanDisk’s NAND products practice the “terminating” limitation of claim 1 of the '517 patent.

As to the final step of claim 1—the “until all plurality of cells are determined to have reached their desired threshold level ranges”—the parties agree that, during a program operation, SanDisk’s NAND products have logic that determines when all the cells in the page selected for programming are verified, ends programming based on this determination, and that once verified, each memory

⁴⁸² CIB 52.

⁴⁸³ RIB 56 citing JX-42C (Samachisa Dep) at 165-66; RX-2153C (Subramanian Rebuttal) at A. 1900, p. 506; RRB 20-21.

⁴⁸⁴ CRB 24; SIB 59-60 citing Quader, Tr. 680; CX-2229C (Rhyne Direct) at 339-41; SRB 31.

cell is permanently inhibited for the duration of the program operation.⁴⁸⁵ ST does not dispute that SanDisk's NAND products practice the "until" limitation of claim 1 of the '517 patent.

Based on the evidence above, the undersigned finds that SanDisk has proved, by a preponderance of the evidence, that its NAND products practice claim 1 of the '517 patent.

b. Dependent Claims

SanDisk asserts that ST does not dispute that SanDisk's NAND products practice the additional limitations added by claims 3, 5-8, 10, and 12 of the '517 patent.⁴⁸⁶ Specifically, SanDisk asserts that there is no dispute that SanDisk's MLC NAND memory products, which include four threshold level ranges separated by three breakpoint levels, satisfy the additional limitations of claims 3 and 5. SanDisk also asserts that there is no dispute that SanDisk's NAND products meet the additional limitations and steps of claims 7 and 8 by erasing an entire block of memory cells at the same time and then programming a subset of cells within that block. In addition, the parties agree that SanDisk's NAND products perform the program and erase operations on a single integrated circuit chip, meeting the additional limitation of claim 10. Furthermore, the parties agree that the additional limitation of claim 12 is met since, during programming, the threshold level ranges reached by SanDisk's NAND products corresponds to the chunk of input data.⁴⁸⁷

Based on the evidence above, the undersigned finds that SanDisk has proved, by a preponderance of the evidence, that its NAND products practice claims 3, 5-8, 10, and 12 of the '517 patent.

⁴⁸⁵ CIB 53.

⁴⁸⁶ CIB 53 citing ST's Pretrial Brief at 481-87; *see also* RIB 55-56 which does not include any arguments regarding the dependent claims.

⁴⁸⁷ CIB 53.

2. Economic Prong

As noted above, the undersigned issued an initial determination on November 17, 2006, granting SanDisk's motion for summary determination on domestic industry, economic prong for the '517 patent.⁴⁸⁸ On December 8, 2006, the Commission issued a notice of decision not to review the initial determination. Accordingly, no further discussion regarding the economic prong for the '517 patent is required.

D. Validity

1. Ordinary Skill in the Art

SanDisk asserts that one of ordinary skill in the art is a person with a bachelor's degree in electrical engineering, and two to three years of experience with non-volatile memory.⁴⁸⁹ ST asserts that one of ordinary skill in the art is a person with a master's degree in electrical engineering, or equivalent experience, and several years of experience in the design of floating gate memories or designing non-volatile memory circuit and systems.⁴⁹⁰ Staff asserts that one of ordinary skill in the art is a person with a master's degree in electrical engineering with several years experience in non-volatile memory design and in systems containing such memories.⁴⁹¹ According to Staff, a slightly higher level of skill in the art is appropriate with respect to the '517 patent than for the '338 patent because the '517 patent deals with systems, rather than simply a chip. Nevertheless, Staff asserts that this is not an exceptionally high or low level of skill in the art, and does not significantly affect

⁴⁸⁸ See Order No. 37 (November 17, 2006).

⁴⁸⁹ RFF 2350 citing Rao, Tr. 3181.

⁴⁹⁰ RIB 3, 61 citing Rhyne, Tr. 1726-28; RX-1801C (Subramanian Direct) at 5-6; RX-1802C (Pashley Direct) at 40.

⁴⁹¹ SIB 77 citing RX-1802C (Pashley Direct) at 40.

the analysis.⁴⁹²

The undersigned agrees with ST and Staff that a person of ordinary skill in the art to which the ‘517 pertains would, in 1989, have had a master’s degree in electrical engineering with several years experience in the design of floating gate memories or designing non-volatile memory circuit and systems.

2. Anticipation

a. GB ‘145

ST asserts that U.K. patent GB 2,029,145 (“GB ‘145”)⁴⁹³ is prior art to the ‘517 patent. According to ST, GB ‘145 discloses a permanent inhibit system to control removal of a charge from a memory cell’s floating gates to avoid over erasing beyond their target state.⁴⁹⁴ Further, it discloses use of this system when adding a charge, *i.e.* programming, to cells.⁴⁹⁵ Therefore, ST asserts that GB ‘145 anticipates claims 1, 6, and 10 of the ‘517 patent.⁴⁹⁶

Specifically, ST asserts that, based on ST’s and Staff’s claim construction that the term “appropriate voltage conditions . . . to alter” includes both adding and removing charge from cells, there is no real dispute that GB ‘145 anticipates.⁴⁹⁷ ST also asserts that, as to the “ranges” limitation, SanDisk is using a different claim construction for infringement and validity, which is clearly prohibited.⁴⁹⁸

⁴⁹² SIB 77 citing 2 Donald S. Chisum, *Chisum on Patents* §§ 5.03[4][e][ii], [iii], [v] (2003) (discussing effect of different levels of skill in the art).

⁴⁹³ RX-875 (GB ‘145).

⁴⁹⁴ RIB 63 citing CX-2235C (Rao Direct) at A. 300, p. 85.

⁴⁹⁵ RIB 63 citing RX-875 (GB ‘145) at ST560-H 14151, l. 51-53).

⁴⁹⁶ RIB 63-64; RRB 23.

⁴⁹⁷ RIB 64.

⁴⁹⁸ RIB 64-65 citing *Yoon Ja Kim v. Conagra Foods, Inc.*, 465 F.3d 1312, 1324 (Fed. Cir. (continued...))

SanDisk asserts that, when claim 1 of the ‘517 patent is properly construed, *i.e.* only covers a program operation, not an erase operation, GB ‘145 does not anticipate.⁴⁹⁹ According to SanDisk, Dr. Pashley admitted that the whole purpose of GB ‘145 is to do erasing.⁵⁰⁰ Therefore, SanDisk asserts that GB ‘145 expressly teaches away from using the disclosed bitwise control of erase for a program operation.⁵⁰¹

Staff agrees with ST and asserts that the GB ‘145 reference anticipates claims 1, 6, and 10 (insofar as it depends from claims 1 and 6) of the ‘517 patent.⁵⁰² Specifically, Staff points to the testimony of ST’s expert, Dr. Pashley, who testified how the GB ‘145 discloses all the limitations of claims 1, 6, and 10.⁵⁰³ According to Staff, SanDisk’s expert, Dr. Rao, only testified that the GB ‘145 does not anticipate because it teaches erasing, rather than programming; therefore, it does not meet the limitations for altering the charge level and desired threshold level ranges.⁵⁰⁴ Staff notes that SanDisk’s arguments are entirely based on faulty claim construction that claim 1 is limited to programming.⁵⁰⁵ In addition, Staff counters SanDisk’s argument that the GB ‘145 reference teaches away from using programming as being irrelevant based on established case law.⁵⁰⁶

The undersigned agrees with ST and Staff that the GB ‘145 reference anticipates each and

⁴⁹⁸(...continued)

2006) (“*Kim*”).

⁴⁹⁹ CIB 67; CRB 27.

⁵⁰⁰ CIB 67 citing CFF 4741.

⁵⁰¹ CIB 67 citing CFF4747-58.

⁵⁰² SIB 75; SRB 35-36.

⁵⁰³ SIB 75 citing RX-1802C (Pashley Direct) at 80-84.

⁵⁰⁴ SIB 75 citing CX-2235C (Rao Direct) at 210-15.

⁵⁰⁵ SIB 76.

⁵⁰⁶ SRB 36 citing *Seachange Int’l, Inc. v. C-COR Inc.*, 413 F.3d 1361, 1380 (Fed. Cir. 2005) (“*Seachange*”); *Celeritas Technologies, Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1106 (1999) (“*Celeritas*”).

every limitation of claims 1, 6, and 10 of the ‘517 patent.⁵⁰⁷ The entirety of SanDisk’s argument is based on SanDisk’s claim construction that claim 1 of the ‘517 patent was limited to programming, which the undersigned found to be unpersuasive. Accordingly, ST has proven, by clear and convincing evidence, that claims 1, 6, and 10 of the ‘517 patent are anticipated by the GB ‘145 reference.

b. The ‘179 Patent

ST asserts that U.S. Patent No. 4,989,179 (“the ‘179 patent”)⁵⁰⁸ is prior art to the ‘517 patent. According to ST, the ‘179 patent discloses a system for storing two or more bits of digital information in floating gate memory cells as multi-level digital information. Therefore, ST asserts that the ‘179 patent anticipates claims 1, 3, 5, 6, 10, 12, 13, and 14 of the ‘517 patent.⁵⁰⁹

Specifically, ST asserts that the parties dispute is narrow because Dr. Rao conceded that the ‘179 patent discloses the “permanent inhibit” aspect of claim 1’s “terminating” limitation.⁵¹⁰ According to ST, SanDisk’s and Staff’s assertion that the ‘179 patent does not disclose the “until” limitation should be rejected, as Judge Luckern rejected a similar argument regarding claim 27 of the ‘338 patent.⁵¹¹ In addition, ST argues that the ‘179 patent also expressly teaches that the “write operation is such that the trial chargings of the column will occur until the columns are charged to a level which matches the input sample.”⁵¹² According to ST, under SanDisk’s claim construction of “until,” the express language in the ‘179 patent informs a person of ordinary skill in the art how

⁵⁰⁷ RX-1802C (Pashley Direct) at 80-84.

⁵⁰⁸ CX-319/RX-712 (the ‘179 patent).

⁵⁰⁹ RIB 65.

⁵¹⁰ RIB 65 citing Rao, Tr. 3000.

⁵¹¹ RIB 65 citing CX-372C (the 526 ID) at 112-16; RRB 23-24.

⁵¹² RRB 23 citing CX-319/RX-712 (the ‘179 patent) at col. 11:57-59.

to perform the “until” method step.⁵¹³

SanDisk asserts that the ‘179 patent does not anticipate the asserted claims of the ‘517 patent because the ‘179 patent is just an analog recorder or “tape recorder on a chip.” According to SanDisk, an analog recorder programs to an exact threshold level matching the desired analog signal. Therefore, SanDisk asserts that the ‘179 patent does not disclose threshold level ranges, which is required in the “determining” and “terminating” limitations of claim 1 of the ‘517 patent.⁵¹⁴ Specifically, as to the “determining” limitation, SanDisk asserts that during programming, the comparator determines when the level in the cell matches the analog input signal to be stored and when that happens, the programming ends.⁵¹⁵ As to the “terminating” limitation, SanDisk asserts that the analog recorder applies programming conditions to each row of cells for a fixed period of time, rather than “until it is determined that all of the plurality of cells are determined to have reached their desired threshold level ranges.”⁵¹⁶

SanDisk asserts that Dr. Pashley’s testimony regarding the “digital embodiments” supposedly disclosed in the ‘179 patent is not persuasive because he is essentially rewriting the key sentence upon which he relies and because the embodiments have the same circuitry as the analog recorder and therefore operate in the same way.⁵¹⁷ SanDisk points to the testimony of Dr. Simko, who testified that prior to the 1999-2000 time frame, he had never worked on multi-level digital

⁵¹³ RRB 23-24 citing RX-1802C (Pashley Direct) at A.313; Pashley, Tr. 2478-79.

⁵¹⁴ CIB 62 citing CFF4519, 4524, 4609-12; CIB 65 citing CFF4611-16.

⁵¹⁵ CIB 65-66 citing CFF 4625-30, 4635-56; Pashley, Tr. 2556.

⁵¹⁶ CIB 66 citing CFF 4665-83; JX-43C (Simko Dep) at 76-77; CX-319/RX-712 (the ‘179 patent) at col. 11:52-56.

⁵¹⁷ CIB 62-63.

memory.⁵¹⁸

Staff asserts that the Simko '179 patent does not anticipate the asserted claims of the '517 patent because it does not satisfy the “terminating” or “until” limitations of independent claim 1.⁵¹⁹ Specifically, Staff asserts that the '179 patent applies appropriate voltage conditions for a fixed period of time and then terminates the operation regardless of whether all of the cells have reached their desired states.⁵²⁰ In addition, Staff argues that much of ST's arguments are based on Judge Luckern's anticipation and obviousness findings in the 526 investigation. Staff notes, however, that the Commission did not adopt Judge Luckern's findings on anticipation and obviousness. Therefore, Staff asserts those findings do not stand as precedent.⁵²¹

ST counters SanDisk's arguments and asserts that Dr. Pashley demonstrated two separate ways a person of ordinary skill in the art would implement the '179 patent's disclosed digital multi-level storage functionality in an EEprom system.⁵²² First, Dr. Pashley testified about using a digital-to-analog and analog-to-digital converter. According to ST, the '179 patent discloses using an analog-to-digital converter for input and a second digital-to-analog converter for output.⁵²³ Second, Dr. Pashley testified about using discrete, repeatable tones as breakpoint threshold levels.⁵²⁴

As to whether Judge Luckern's validity findings in the 526 investigation are relevant here, the undersigned finds that because the Commission did not specifically adopt Judge Luckern's

⁵¹⁸ CIB 63 citing JX-43C (Simko Dep) at 31.

⁵¹⁹ SIB 74-75; SRB 36.

⁵²⁰ SIB 75 citing CX-2235C (Rao Direct) at 63-70, 206-08; CX-319/RX-712 (the '179 patent) at col. 11:52-56; JX-73 (Simko Dep) at 76; SRB 36.

⁵²¹ SRB 37 citing *Certain NAND Flash Memory Circuits*, Notice of Comm'n Decision at 2 (Dec. 5, 2005).

⁵²² RRB 24-25 citing Pashley, Tr. 2614-19.

⁵²³ RRB 25 citing CX-319/RX-712 (the '179 patent) at col. 4:41-45.

⁵²⁴ RRB 25 citing Pashley, Tr. 2636, 3220-21.

findings on validity, they are not determinative here. As to the substantive arguments, the undersigned finds SanDisk's and Staff's arguments regarding the "until" limitation to be persuasive. Based on the testimony presented, the '179 patent applies appropriate voltage conditions for a fixed period of time and then terminates the operation regardless of whether all of the cells have reached their desired states.⁵²⁵ Therefore, the '179 patent does not teach the "until" limitation required by claim 1 of the '517 patent. Because the '179 patent does not describe each and every element of claim 1, it does not anticipate claim 1, or any of the dependent claims of the '517 patent. Accordingly, ST has not shown, by clear and convincing evidence, that the '517 patent is invalid as anticipated by the '179 patent.

c. M293

ST asserts that the M293 is prior art to the '517 patent and anticipates claims 1, 6, and 10 of the '517 patent. According to ST, under SanDisk's claim construction, the M293 performs permanent inhibit 99.9% of the time; therefore, the M293 performs the "terminating" method step 99 out of every 100 program operations. Therefore, ST asserts that the M293 anticipates claims 1, 6, and 10 of the '517 patent.⁵²⁶

SanDisk asserts that the M293 does not anticipate the '517 patent because it performs temporary, not permanent, inhibit, which has not only been confirmed by ST's expert, Dr. Pashley, but has been found to be the case by two ALJ's and the Patent Office. In addition, the M293 is cited prior art to the '517 patent.⁵²⁷ Staff agrees with SanDisk that the M293 does not anticipate the

⁵²⁵ CX-2235C (Rao Direct) at 63-70, 206-08; CX-319/RX-712 (the '179 patent) at col. 11:52-56; JX-73 (Simko Dep) at 76; SRB 36.

⁵²⁶ RIB 67; RRB 25.

⁵²⁷ CRB 29.

asserted claims of the ‘517 patent because the device only uses “temporary” inhibit, a point that was conceded by ST’s expert, Dr. Pashley.⁵²⁸

The undersigned finds SanDisk’s and Staff’s arguments to be persuasive. The evidence shows that the M293 performs temporary, rather than permanent, inhibit.⁵²⁹ In addition, the M293 was before the Patent Office during the prosecution of the ‘517 patent.⁵³⁰ Therefore, ST has a higher burden in showing that the M293 anticipates, which has not been shown.⁵³¹ Accordingly, ST has not shown, by clear and convincing evidence, that the ‘517 patent is invalid as anticipated by the M293.

3. Obviousness

ST asserts that the asserted claims of the ‘517 patent are obvious over either the Japanese Unexamined Patent Application S62-188100 (“JP100”)⁵³² reference standing alone or in combination with other references.⁵³³ Staff agrees that the asserted claims are rendered obvious by JP100 in combination with the ‘179 patent and/or the ‘344 patent.⁵³⁴ SanDisk counters, arguing that there is a lack of motivation to combine.⁵³⁵

The undersigned notes that all of the parties post-hearing briefs and reply briefs were filed before the Supreme Court issued its decision in *KSR*.⁵³⁶ On May 25, 2007, counsel from SanDisk and ST submitted a letter to the undersigned requesting guidance whether the undersigned would find

⁵²⁸ SRB citing RX-1802C (Pashley Direct) at 85.

⁵²⁹ RX-1802C (Pashley Direct) at 85.

⁵³⁰ See CX-99/RX-2 (the ‘517 patent), first page.

⁵³¹ *Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371, 1381 (Fed. Cir. 2007) (“*Liebel-Flarsheim II*”) citing *Glaxo*, 376 F.3d at 1348 (burden of showing invalidity is “especially difficult” when the prior art reference was before the examiner during prosecution).

⁵³² RX-800 (JP100).

⁵³³ RIB 67.

⁵³⁴ SIB 77-82; SRB 37-40.

⁵³⁵ CIB 72-83; CRB 29-38.

⁵³⁶ *KSR*, *supra*.

additional briefing useful in light of *KSR*. SanDisk's position is that additional briefing would be useful to several of the factual inquiries required in the obviousness analysis, while ST's position is that *KSR*'s affect on the parties existing § 103 arguments is clear. Staff does not object to additional briefing if the undersigned would find such briefing useful. In reviewing the Supreme Court's decision and the evidence and briefing on the obviousness issues, the undersigned had already determined that additional briefing would neither be helpful nor necessary. Nothing in the joint letter has changed this determination. Accordingly, no additional briefing will be required on obviousness.

Upon review of the parties arguments, the undersigned finds that much of the dispute between the parties is whether ST has made an adequate showing of a motivation to combine the various prior art references. While the Supreme Court, in *KSR*, noted that there is "no necessary inconsistency between the idea underlying the TSM [teaching, suggestion, or motivation] test and the *Graham* analysis," the Supreme Court made it clear that the TSM test was being applied too rigidly and against prior Supreme Court precedents:

In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103. One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.

The first error of the Court of Appeals in this case was to foreclose this reasoning by holding that courts and patent examiners should look only to the problem the patentee was trying to solve. . . . The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. 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.

The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. . . . Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. . . . A person of ordinary skill is also a person of ordinary creativity, not an automaton.

The same constricted analysis led the Court of Appeals to conclude, in error, that a patent claim cannot be proved obvious merely by showing that the combination of elements was "obvious to try." *Id.*, at 289 (internal quotation marks omitted). 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. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.

The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U.S., at 36, 86 S. Ct. 684, 15 L. Ed. 2d 545 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412 (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.⁵³⁷

Based on a reading of the Supreme Court's precedent in *KSR*, the undersigned finds that many of the parties' specific "motivation to combine" arguments fall within the scope of what the Supreme Court has cautioned as being applied too rigidly. Therefore, the undersigned will focus on the original *Graham* factors to determine whether the '517 patent is obvious under § 103.

a. JP100

ST asserts that JP100, when modified as known to those of skill in the art, renders claims 1,

⁵³⁷ *KSR*, 500 U.S. at – ; 127 S.Ct. at 1741-43.

6, and 10 of the '517 patent obvious.⁵³⁸ ST asserts that SanDisk's conceded that the only limitation of claim 1 that is not disclosed by JP100 is an electrical erase capability.⁵³⁹ According to ST, one of skill in the art would have been motivated to modify JP100 to include the electrical erase capability for numerous reasons.⁵⁴⁰

SanDisk asserts that the '517 patent is directed to "semiconductor electrically erasable programmable read-only memories (EEPROM), and specifically to a system of integrated circuit Flash EEPROM chips,"⁵⁴¹ while JP100 is directed to a completely different "field of endeavor."⁵⁴² According to SanDisk, the purpose of JP100 was to obtain a writing method fitted for pre-processing of a storage characteristic test, sometimes referred to as a memory maintenance characteristic test.⁵⁴³ According to SanDisk, in 1989, a person of ordinary skill in the art faced with the problems that were faced by the inventors of the '517 patent would have no reason to select elements from JP100 and combine it with missing elements to obtain the claimed invention.⁵⁴⁴

SanDisk also asserts that JP100 does not disclose any "programming methods" for an EPROM. While SanDisk concedes that JP100 repeatedly makes reference to a method of writing to EPROMs, it does not ever make reference to a method of programming EPROMs.⁵⁴⁵ As to ST's assertion that JP100 teaches a way to avoid over-programming, SanDisk asserts that JP100 avoids over-programming for completely different reasons than in the '517 patent. According to SanDisk, the

⁵³⁸ RIB 68 citing *Sibia Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1356 (Fed. Cir. 2000) ("*Sibia*").

⁵³⁹ RIB 68 citing Complainant's prehearing brief at 455; Rao, Tr. 3009-10.

⁵⁴⁰ RIB 68 citing RX-1802C (Pashley Direct) at A. 224, p. 54.

⁵⁴¹ CRB 31 citing CX-99/RX-2 (the '517 patent) at col. 1:25-28.

⁵⁴² CRB 31 citing *Wang Laboratories, supra*.

⁵⁴³ CIB 79 citing CX-1247 (JP100 abstract); RX-800 (JP100) at ST560-H 19203.

⁵⁴⁴ CIB 79, 82.

⁵⁴⁵ CIB 80 citing RX-800 (JP100) at ST560-H19203.

inventors in the '517 patent used permanent inhibit to prevent over-programming, while JP100 seeks to avoid over-programming to align to a specific level the threshold voltage as a starting point for data retention testing.⁵⁴⁶ In addition, SanDisk asserts that over-programming is not the problem that the inventors of the '517 patent were seeking to solve; rather, it was an aspect of their solution.⁵⁴⁷ Therefore, SanDisk asserts that ST is improperly attempting to define the problem in terms of its solution, based on hindsight.⁵⁴⁸

SanDisk counters ST's four motivations for modifying JP100 to obtain the claimed invention of claim 1 of the '517 patent. SanDisk asserts that ST's first two motivations ignore any motivation to select JP100 to solve the problem faced by the inventors of the '517 patent and merely asserts that adding such erase capability is desirable. SanDisk asserts that ST's third motivation, *i.e.* improvements the JP100 made to reliability testing, has nothing to do with the problem faced by the inventors. SanDisk asserts that ST's fourth motivation, *i.e.* that an enhanced write operation for EEPROMs and EPROMs that minimizes stress to the device is one of the stated objects of the '517 invention, misrepresents the '517 patent because the '517 patent never mentions EPROMs, only Flash EEPROMs.⁵⁴⁹

Staff does not take a position on the JP100 reference standing alone, only in combination with other references, which is discussed below.

The undersigned rejects SanDisk's arguments, as they are based on the rigid "motivation to combine" framework that has been rejected by the Supreme Court in *KSR*. The undersigned also

⁵⁴⁶ CIB 81 citing RX-800 (JP100) at ST560-H19203.

⁵⁴⁷ CIB 81-82.

⁵⁴⁸ CIB 82 citing *Monarch Knitting Mach. Corp. v. Sulzer Morat GMBH*, 139 F.2d 877, 881 (Fed. Cir. 1998) ("*Monarch*").

⁵⁴⁹ CRB 33 citing CX-99/RX-2 (the '517 patent) at col. 1:41-60.

finds ST's argument persuasive. SanDisk's expert, Dr. Rao, conceded that JP100 disclosed every element of claim 1 except for the first "E" in EEprom:

- Q. Indeed, you would agree with me that the JP-100 shows all of the elements of claim 1 of the '517 except that it is an EPROM instead of an EEPROM?
- A. Can I look at the claim 1 of '517? Quickly. Quickly. It won't take --
- Q. It's RX-2. We can pull it up -- can you put claim 1 on the screen, please.
- A. That will be fine.
- Q. There it is.
- A. Yes. I agree with that.⁵⁵⁰

At the time of the '517 patent, one of ordinary skill would recognize that adding an erase electrode to make an Eprom into an EEprom would be advantageous.⁵⁵¹ Therefore, the suggestion to make such a modification is in the prior art itself and is part of the knowledge of one of ordinary skill in the art. The undersigned finds that for a person of ordinary skill in the art in the non-volatile memory field, that person would naturally look to Eprom solutions in the development of EEproms.⁵⁵² Accordingly, ST has shown, by clear and convincing evidence, that claim 1 of the '517 patent is invalid as obvious based on the JP100 reference.⁵⁵³

⁵⁵⁰ Rao, Tr. 3009-10.

⁵⁵¹ RX-1802C (Pashley Direct) at A. 224-32, 236-53, 258-58.

⁵⁵² See *Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73F.3d 1085, 1090 (Fed. Cir. 1995) ("*Para-Ordnance*"); *In re Gartside*, 203 F.3d 1305, 1321 (Fed. Cir. 2000) ("*Gartside*").

⁵⁵³ *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000) ("*Kotzab*") ("The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. See [*In re*] *Dembiczak*, 175 F.3d [994] at 999, 50 USPQ2d at 1617 [Fed. Cir. 1999]. In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. See *WMS Gaming, Inc. v. International Game Tech.*, 184 F.3d 1339, 1355, 51 USPQ2d 1385, 1397 (Fed. Cir.1999). The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (1981) (and cases cited therein). Whether the Board relies on an express or an implicit showing, it must provide particular findings related thereto. See *Dembiczak*, 175 F.3d at 999, 50 USPQ2d at 1617. Broad conclusory statements standing alone are not 'evidence.' *Id.*")

b. JP100 and the '179 Patent

ST asserts that JP100, when combined with the '179 patent, renders claims 1, 3, 5, 6, 7, 10, 12, 13, and 14 of the '517 patent obvious.⁵⁵⁴ ST asserts that SanDisk's expert conceded that the only limitations of these claims that are missing from the '179 patent, *i.e.* the presence of threshold level ranges and the "until" limitation, are found in JP100.⁵⁵⁵ According to ST, one of skill in the art would have been motivated to combine JP100 and the '179 patent for numerous reasons.⁵⁵⁶

Specifically, ST asserts that the motivation to combine lies in the nature of the problem addressed by the invention, *i.e.* how to prevent over-programming of memory cells. According to ST, both JP100 and the '179 patent directly address the problem and teach permanent inhibit to solve it.⁵⁵⁷ Therefore, ST asserts that to a person of ordinary skill in the art working on the problem of preventing over-programming of a memory cell, it would have been obvious to bring together the method and structure of permanently inhibiting shown in JP100 and the '179 patent to arrive at the claimed invention in the '517 patent.⁵⁵⁸ ST also asserts that a motivation to combine can be found in the patents' cross-referential teaching on testing.⁵⁵⁹

SanDisk asserts that, in 1989, a person of ordinary skill in the art that was faced with the problems that were faced by the inventors of the '517 patent would have no reason to select elements from the '179 patent and combine it with missing elements to obtain the claimed invention.

⁵⁵⁴ RIB 69 citing RX-1802C (Pashley Direct) at A. 853-903, p. 204-15.

⁵⁵⁵ RIB 69.

⁵⁵⁶ RIB 69 citing RX-1802C (Pashley Direct) at A. 686-88, p. 166; A. 874-76, p. 209-10; A. 900, p. 215.

⁵⁵⁷ RRB 33 citing *Sibia*, 225 F.3d at 1356; RX-800 (JP100) at ST560-H 19203-04; CX-319/RX-712 (the '179 patent) at col. 10:47-53.

⁵⁵⁸ RRB 33 citing *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1276 (Fed. Cir. 2004) ("*Ruiz*").

⁵⁵⁹ RRB 33.

Specifically, SanDisk asserts that the Simko invention is merely a “tape recorder on a chip” addressing the problem with digital recorders that has nothing to do with the problem to be solved by the ‘517 patent, which is to providing solid-state mass storage for computer systems. SanDisk points to the testimony of Dr. Simko, who stated that the analog recorder required “reasonable” precision, and could therefore tolerate small errors, whereas Flash EEPROMs suitable for computer mass storage require a high level of precision. SanDisk also argues that the Simko analog recorder operated at a low speed when compared with a high-performance EEPROM.⁵⁶⁰ SanDisk asserts that the ‘179 patent does not disclose any digital embodiments,⁵⁶¹ and that the comparator in the ‘179 patent cannot determine a cell’s threshold level range because it can only determine its threshold level.⁵⁶² As to claim 7, SanDisk asserts that ST failed to raise this issue in its pretrial brief; therefore the issue is waived under Ground Rule 8.2. Furthermore, SanDisk asserts that Dr. Pashley did not testify that JP100 in combination with the ‘179 patent renders claim 7 obvious.⁵⁶³

ST counters SanDisk’s arguments that these two pieces of prior art are not analogous because both of them are not directed to replacing “mass storage” in computers. ST argues that, based on the clear motivations to combine, the argument is irrelevant.⁵⁶⁴

Staff asserts that claims 1, 3, 5, 6, 10, 12, 13, and 14 of the ‘517 patent are invalid under 35 U.S.C. § 103(a) in view of JP100 in combination with the ‘179 patent.⁵⁶⁵ Specifically, Staff points to the testimony of ST’s expert, Dr. Pashley, who testified how each of the limitations of the

⁵⁶⁰ CIB 77 citing CFF 5368-77; CX-319/RX-712 (the ‘179 patent) at col. 1:36-39, 6:20-29.

⁵⁶¹ CIB 78 citing CFF 4589-90, 4593.

⁵⁶² CRB 37 citing CFF 4628-30.

⁵⁶³ CRB 36.

⁵⁶⁴ RRB 33-34.

⁵⁶⁵ SIB 77-78; SRB 37.

asserted claims is satisfied by JP100 in combination with the '179 patent.⁵⁶⁶ According to Staff, as to claim 1 of the '517 patent, while SanDisk's expert, Dr. Rao, argues that the limitations that were not taught by the '179 patent include "a variable threshold level of a cell" that is "set into range determinable by reading a cell"; "determining the threshold level ranges"; and continuing the programming, verifying and inhibiting processes "until all of the plurality of cells are determined to have reached their desired threshold level ranges," Dr. Rao acknowledges that all of these limitations are taught by JP100.⁵⁶⁷ As to claims 6 and 10, Staff asserts that Dr. Rao did not dispute that the '179 patent teaches these additional limitation.⁵⁶⁸ As to claims 3 and 5, Staff asserts that while Dr. Rao testified that the '179 patent does not disclose the multiple threshold ranges limitations, clear and convincing evidence shows that the '179 patent does disclose such ranges.⁵⁶⁹ As to claims 12, 13, and 14, Staff asserts that while Dr. Rao testified that the '179 patent does not teach the "chunk of input data" or "cache memory" limitations, clear and convincing evidence shows that the '179 patent does disclose limitations.⁵⁷⁰ In addition, Staff asserts that ST has made a clear and convincing showing of motivation to combine. According to Staff, ST's expert testified that a person of ordinary skill in the art would be motivated to combine the references in order to made a superior EEprom, which is confirmed by the references themselves, *i.e.* the '179 patent teaches a floating gate EEprom, while JP100 relates to improving methods of writing to floating gate Eeproms.⁵⁷¹

Staff argues that SanDisk does not appear to seriously contest that this combination discloses

⁵⁶⁶ SIB 78 citing RX-1802C (Pashley Direct) at 204-15.

⁵⁶⁷ SIB 78 citing CX-2235C (Rao Direct) at 216-17.

⁵⁶⁸ SIB 78 citing CX-2235C (Rao Direct) at 216.

⁵⁶⁹ SIB 78 citing CX-2235C (Rao Direct) at 219 and RX-1802C (Pashley Direct) at 210-12.

⁵⁷⁰ SIB 78 citing CX-2235C (Rao Direct) at 216 and RX-1802C (Pashley Direct) at 214.

⁵⁷¹ SIB 79 citing RX-1802C (Pashley Direct) at 208-10, 215; CX-319/RX-712 (the '179 patent) at col. 1:56-2:25, 3:10-12; RX-800 (JP100) at 19201.

all of the limitations of the asserted claims. Rather, Staff notes that SanDisk appears to rely on the alleged lack of motivation to combine.⁵⁷² In Staff's view, both JP100 and the '179 patent are directed to the same problem addressed in the '517 patent, which is how to improve programming techniques for floating gate memory cells.⁵⁷³

The undersigned rejects SanDisk's arguments, as they are based on the rigid "motivation to combine" framework that has been rejected by the Supreme Court in *KSR*. The undersigned also agrees with ST and Staff that the evidence shows that claims 1, 3, 5, 6, 10, 12, 13, and 14 of the '517 patent are taught by JP100 in combination with the '179 patent.⁵⁷⁴ The undersigned agrees that SanDisk did not seriously contest that this combination discloses all of the limitations of the asserted claims and relies primarily on its "motivation to combine" arguments, which have been rejected. The undersigned finds that the references are closely related, as the JP100 reference relates to improving methods of writing to floating gate Eproms, while the '179 patent relates to floating gate EEproms. According to the '338 patent, which is incorporated by reference into the '517 patent, the problems of improving Eproms and EEproms are closely related.⁵⁷⁵ Therefore, it would be reasonable for a person of ordinary skill in the non-volatile memory field to naturally look to Eprom solutions in the development of EEproms and combine the references together.

As for claim 7, the undersigned finds SanDisk's procedural argument to be persuasive. A review of ST's pre-trial brief shows no mention of ST's intention to argue that JP100 in combination

⁵⁷² SRB 37.

⁵⁷³ SRB 37-38 citing CX-99/RX-2 (the '517 patent) at col. 1:59-60; RX-800 (JP100) at 19200; CX-319/RX-712 (the '179 patent) at col. 2:43-46.

⁵⁷⁴ See RX-1802C (Pashley Direct) at 204-15.

⁵⁷⁵ See CX-99/RX-2 (the '517 patent) at col. 8:30-37; CX-98/RX-1 (the '338 patent) at col. 2:23-25, 2:30-33.

with the '179 patent renders claim 7 of the '517 patent obvious.⁵⁷⁶ Therefore, ST's assertion that claim 7 of the '517 patent is obvious based on JP100 in combination with the '179 patent is rejected.

Accordingly, ST has shown, by clear and convincing evidence, that claims 1, 3, 5, 6, 10, 12, 13, and 14 of the '517 patent are invalid as obvious based on the JP100 reference in combination with the '179 patent. Claim 7 of the '517 patent, however, is not found to be invalid as obvious based on the JP100 reference in combination with the '179 patent.

c. JP100 and the '344 patent

ST asserts that JP100, when combined with U.S. Patent No. 5,095,344 ("the '344 patent"),⁵⁷⁷ renders claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of the '517 patent obvious.⁵⁷⁸ According to ST, the '344 patent is directed to increasing the amount of information stored in an Eprom or EEPROM array of a given size and providing EEPROM semiconductor chips to be used for solid state memory to replace magnetic storage devices.⁵⁷⁹ ST asserts that one of ordinary skill in the art would have been motivated to combine JP100 and the '344 patent for numerous reasons.⁵⁸⁰ Specifically, ST asserts that there is a motivation stemming from technological progress and that the references themselves practically cross-reference each other.⁵⁸¹

Specifically, ST asserts that the '344 patent discloses multilevel programming of EEPROM cells using more than two threshold levels separated by more than one breakpoint threshold level

⁵⁷⁶ See ST's pretrial brief at 565.

⁵⁷⁷ RX-362 (the '344 patent).

⁵⁷⁸ RIB 69-70 citing RX-1802C (Pashley Direct) at A. 193-208, 383-91, 904-33.

⁵⁷⁹ RIB 70 citing RX-362 (the '344 patent) at col. 2:33-36.

⁵⁸⁰ RIB 70-72.

⁵⁸¹ RIB 70; RRB 34 citing RX-1802C (Pashley Direct) at A. 236-53.

range.⁵⁸² ST argues that SanDisk's expert, Dr. Rao, conceded that the '344 patent discloses the multi-state elements of the '517 claims 3 and 5 that were missing from JP100.⁵⁸³ According to ST, a person of ordinary skill in the art would have been motivated to modify the structure disclosed in JP100 with an erasable, multilevel structure of the '344 patent in order to make a more compact EEPROM. In addition, ST asserts that it was common knowledge in the EEPROM art that higher integration or density is and always has been a basic goal of memory design.⁵⁸⁴

As to claims 7, 8, and 10, ST asserts that JP100, in combination with the '344 patent, discloses these additional limitations. According to ST, the limitations of claims 7 and 8 were known to those of ordinary skill in the art.⁵⁸⁵ ST argues that a person of ordinary skill in the art modifying JP100 to include erase capability in light of the '344 patent would be aware of the benefits of the different units of erase, including blocks, sectors, and wordlines.⁵⁸⁶

As to claims 12, 13, and 14, ST asserts that the only limitations Dr. Rao does not concede to be disclosed by JP100 in combination with the '344 patent are the "chunk of input data" in claims 12 and 13, and the "cache memory" in claim 14.⁵⁸⁷ According to ST, a person of ordinary skill in the art that was combining JP100 and the '344 patent would use data latches for storing input data on a chip during an internally timed write cycle, which would meet the additional limitations in claims

⁵⁸² RIB 70 citing RX-362 (the '344 patent) at col. 24:5-38.

⁵⁸³ RIB 70 citing CX-2235C (Rao Direct) at A. 874, p. 221.

⁵⁸⁴ RIB 70 citing RX-1802C (Pashley Direct) at A. 912, p. 218-19; A. 243, p.57.

⁵⁸⁵ RIB 70-71 citing CX-2235C (Rao Direct) at A. 1026, p. 261; JX-38C (Mehrotra Dep) at 126-128; RX-889 (SEEQ 48F512 datasheet) at SDITC-II 7043-44; CX-99/RX-2 (the '512 patent) at col. 7:6-13.

⁵⁸⁶ RIB 71 citing RX-1802C (Pashley Direct) at A. 108-13, p. 29-30.

⁵⁸⁷ RIB 70 citing Rao, Tr. 3139; CX-2235C (Rao Direct) at A. 874-75, p. 221.

12-14.⁵⁸⁸

SanDisk does not address this combination in its post-trial brief, but does address this combination in its post-trial reply brief.⁵⁸⁹ ST asserts that, because SanDisk failed to raise this issue in its post-trial brief, under Ground Rule 11.1, SanDisk has waived its ability to do.⁵⁹⁰

Staff agrees that claims 1, 3, 5, 6, 7, 8, and 10 of the '517 patent are invalid under 35 U.S.C. § 103(a) in view of JP100 in combination with the '344 patent.⁵⁹¹ Specifically, Staff points to the testimony of ST's expert, Dr. Pashley, who testified how each of the limitations of the asserted claims is satisfied by JP100 in combination with the '344 patent.⁵⁹² Staff argues that SanDisk does not appear to seriously contest that this combination discloses all of the limitations of the asserted claims. Rather, Staff notes that SanDisk appears to rely on the alleged lack of motivation to combine.⁵⁹³ According to Staff, ST's expert testified that a motivation to combine exists both in the nature of the problem to be solved and in the explicit disclosure of the '344 patent that it would be desirable to convert an Eprom into an EEprom.⁵⁹⁴

As to the procedural issue, the undersigned agrees that SanDisk did not address the '344 patent at all in its obviousness section in its post-hearing brief, and that SanDisk has waived any arguments with regard to this combination.⁵⁹⁵ ST clearly briefed this issue extensively in its pre-trial

⁵⁸⁸ RIB 71 citing Pashley, Tr. 2644, 2848-51; RX-947 (JEDEC Standard 21-B) at ST560 461384, 461396; RX-1802C (Pashley Direct) at A. 98-103, p. 26-27. A. 279-91, p. 68-71.

⁵⁸⁹ CRB 33-36.

⁵⁹⁰ RRB 34.

⁵⁹¹ SIB 80; SRB 37.

⁵⁹² SIB 80 citing RX-1802C (Pashley Direct) at 216-21.

⁵⁹³ SIB 80; SRB 37 citing CX-2235C (Rao Direct) at 221.

⁵⁹⁴ SIB 80 citing RX-1802C (Pashley Direct) at 216, 222-23).

⁵⁹⁵ See Order No. 2 (February 14, 2006), Ground Rule 11.1.

brief⁵⁹⁶ and this obviousness combination was discussed in detail during the hearing.⁵⁹⁷ Therefore, SanDisk should have known that ST was going to advance this obviousness combination in the post-trial briefs and SanDisk should have addressed its arguments in the post-trial brief.

The undersigned agrees with ST and Staff that the evidence shows that all the limitations of claims 1, 3, 5, 6, 7, 8, and 10 of the '517 patent are taught by JP100 in combination with the '344 patent.⁵⁹⁸ The undersigned finds that the references are closely related, as the JP100 reference relates to improving methods of writing to floating gate Eproms by aligning to a reference cell and using permanent inhibit, while the '344 patent relates to an intelligent programming and sensing technique to allow for practical implementation of multistate storage.⁵⁹⁹ Accordingly, ST has shown, by clear and convincing evidence, that all of the asserted claims of the '517 patent are invalid as obvious based on the JP100 reference in combination with the '344 patent.

d. JP100 and the '871 patent

ST asserts that JP100, when combined with U.S. Patent No. 4,752,871 ("the '871 patent"),⁶⁰⁰ renders claims 1, 6, 7, 8, 10, 12, 13, and 14 of the '517 patent obvious.⁶⁰¹ According to ST, one of ordinary skill in the art would have been motivated to combine JP100 and the '871 patent for numerous reasons, including making testing process improvements.⁶⁰² As for the additional limitations in claims 7 and 8, ST asserts that a person of ordinary skill in the art would be highly

⁵⁹⁶ See ST's pre-trial brief at 582.

⁵⁹⁷ See, generally, the testimony of Dr. Pashley and Dr. Rao, Tr. 2720-22, 2763-64, 2861-64, 2873-76, 3138-41.

⁵⁹⁸ See RX-1802C (Pashley Direct) at 216-21.

⁵⁹⁹ See RX-800 (JP100) at 19203-06; RX-362 (the '344 patent) at col. 3:24-29.

⁶⁰⁰ RX-351 (the '871 patent).

⁶⁰¹ RIB 72 citing RX-1802C (Pashley Direct) at A. 193-206, 372-76, 934-64.

⁶⁰² RIB 72 citing RX-1802C (Pashley Direct) at A. 944, p. 225-26.

motivated to combine the block erasable, byte programmable architecture of the '871 patent because it increases the speed of testing with the permanent inhibit circuitry that increases the accuracy of programming in testing.⁶⁰³

SanDisk asserts that the '871 patent has nothing to do with the problem of developing EEPROMs to replace computer disk drives; therefore there would be no reason for a person of ordinary skill in the art, faced with the problem of developing EEPROMs to replace computer disk drives, would select the '871 patent. In addition, SanDisk asserts that the '871 patent does not disclose block erase, which is required by claims 7 and 8.⁶⁰⁴

Staff asserts that ST has failed to show, by clear and convincing evidence, that the asserted claims of the '517 patent are invalid under 35 U.S.C. § 103(a) in view of JP100 in combination with the '871 patent.⁶⁰⁵ According to Staff, the '871 patent discloses a microcomputer that uses on-chip EEPROM arrays, which is a different technique than used in JP100.⁶⁰⁶ Staff asserts that ST's expert, Dr. Pashley, merely testified that one would want to divide JP100 into multiple arrays without testifying whether the system of the '871 patent would work in doing so.⁶⁰⁷

The undersigned agrees with SanDisk and Staff that ST has failed to show, by clear and convincing evidence, that the asserted claims of the '517 patent are invalid as obvious based on JP100 in combination with the '871 patent because ST did not provide adequate evidence on how the two references can combine the missing elements to obtain the claimed invention in the '517

⁶⁰³ RRB 36-37 citing RX-1802C (Pashley Direct) at A. 944.

⁶⁰⁴ CRB 38 citing CFF 5538-5855.

⁶⁰⁵ SIB 81; SRB 39, n. 6.

⁶⁰⁶ SIB 81 citing RX-351 (the '871 patent), Fig. 1; CX-2235C (Rao Direct) at 98-100.

⁶⁰⁷ SIB 81 citing RX-1802C (Pashley Direct) at 227.

patent.⁶⁰⁸ Accordingly, ST has failed to show, by clear and convincing evidence, that the '517 patent is invalid as obvious based on JP100 in combination with the '871 patent.

e. JP 100 and the '541 patent

ST asserts that JP100, when combined with U.S. Patent No. 5,136,541 ("the '541 patent"),⁶⁰⁹ renders claims 1, 6, 7, 8, 10, 12, 13, and 14 of the '517 patent obvious.⁶¹⁰ According to ST, one of ordinary skill in the art would have been motivated to combine JP100 and the '541 patent for numerous reasons, including the references pointing to one another.⁶¹¹ ST counters Staff's argument that the '541 is different from JP100. According to ST, the '541 patent provides electrical erase to JP100's permanent inhibit.⁶¹²

SanDisk asserts that the '541 patent has nothing to do with the problem of developing EEproms to replace computer disk drives; therefore there would be no reason for a person of ordinary skill in the art, faced with the problem of developing EEproms to replace computer disk drives, to select the '541 patent. In addition, SanDisk asserts that the '541 patent does not disclose block erase, which is required by claims 7 and 8.⁶¹³

Staff asserts that ST has failed to show, by clear and convincing evidence, that the asserted claims of the '517 patent are invalid under 35 U.S.C. § 103(a) in view of JP100 in combination with the '541 patent.⁶¹⁴ According to Staff, the '541 patent erases by injecting holes, which is a

⁶⁰⁸ CX-2235C (Rao Direct) at 98-100; RX-1802C (Pashley Direct) at 227.

⁶⁰⁹ RX-25 (the '541 patent).

⁶¹⁰ RIB 72 citing RX-1802C (Pashley Direct) at A. 193-206, 372-76, 934-64.

⁶¹¹ RIB 73 citing RX-1802C (Pashley Direct) at A. 243, p. 57; RRB 36.

⁶¹² RRB 36 *citing Amgen*, 314 F.3d at 1357.

⁶¹³ CRB 38 citing CFF 5538-5855.

⁶¹⁴ SIB 81; SRB 39, n. 6.

different technique than used in JP100.⁶¹⁵ Staff asserts that ST's expert, Dr. Pashley, merely testified as to block erase without discussing how or why the '541 patent would be combined with JP100 to provide for block erase.⁶¹⁶

The undersigned agrees with SanDisk and Staff that ST has failed to show, by clear and convincing evidence, that the asserted claims of the '517 patent are invalid as obvious based on JP100 in combination with the '541 patent because ST did not provide adequate evidence on how the two references can combine the missing elements to obtain the claimed invention in the '517 patent.⁶¹⁷ Accordingly, ST has failed to show, by clear and convincing evidence, that the '517 patent is invalid as obvious based on JP100 in combination with the '541 patent.

f. Secondary Considerations

SanDisk asserts that secondary indicia of non-obviousness such as long felt need coupled with failure of others, commercial success, and industry praise supports the validity of the '517 patent.⁶¹⁸ According to SanDisk, at the time of the invention of the '517 patent, there was a long-felt need in the industry for the invention of the '517 patent, *i.e.* a memory device that provided the advantages of a magnetic memory device while avoiding its limitations. SanDisk asserts that while many others developed competing devices which failed, the inventors of the '517 patent succeeded.⁶¹⁹ SanDisk also points to the commercial success of both SanDisk's and Toshiba's

⁶¹⁵ SIB 81 citing RX-25 (the '541 patent) at col. 3:21-24; CX-2235C (Rao Direct) at 94-95.

⁶¹⁶ SIB 81 citing RX-1802C (Pashley Direct) at 233.

⁶¹⁷ CX-2235C (Rao Direct) at 94-95; RX-1802C (Pashley Direct) at 233.

⁶¹⁸ CIB 83 citing *Intel Corp. v. U.S. Int'l Trade Comm'n*, 946 F.2d 821, 835 (Fed. Cir. 1991) ("*Intel*"); CRB 38.

⁶¹⁹ CIB 83 citing CFF6769-6817.

NAND flash memory products, both of which practice the '517 patent.⁶²⁰ In addition, SanDisk asserts that it has won industry accolades and awards for its NAND flash memory products.⁶²¹

ST asserts that SanDisk's arguments regarding secondary considerations are not supported by the evidence. Furthermore, ST asserts that where there is a strong motivation to combine, secondary considerations cannot save the claims.⁶²² Specifically, as to lack of commercial success, ST asserts that SanDisk has failed to prove any commercial success that is owed to the point of novelty in the '517 patent, *i.e.* "permanent inhibit."⁶²³ According to ST, for several years after the invention, SanDisk's products [

] ⁶²⁴ As for SanDisk's NOR products, initially, [

the success of SanDisk's NAND market stems from Toshiba, [⁶²⁵ In addition, ST argues that

] ⁶²⁶ And while SanDisk relies on licensing to demonstrate its commercial success, ST asserts that SanDisk has failed to show sufficient nexus between the licenses and the patent at issue.⁶²⁷

ST asserts that the '179 patent, JP100, and GB '145 all had permanent inhibit prior to the date of the invention of the '517 patent and that Texas Instruments was working on permanent inhibit in 1985-86.⁶²⁸ Therefore, ST asserts that the concept that SanDisk touted as the novel feature

⁶²⁰ CIB 83 citing CFF6818-44.

⁶²¹ CIB 83-84 citing CFF6845-55.

⁶²² RIB 78-79 citing *Sibia*, 225 F.3d at 1358.

⁶²³ RIB 79; RRB 38.

⁶²⁴ RRB 38 citing Harari, Tr. 354.

⁶²⁵ RIB 79 citing Harari, Tr. 354; JX-36C (Harari Dep) at 174.

⁶²⁶ RRB 38 citing *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996) ("*Huang*").

⁶²⁷ RIB 79; RRB 38 citing *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004) ("*Iron Grip*"); *GPAC.*, *supra*; *Sibia*, 225 F.3d at 1358.

⁶²⁸ RIB 79 citing Rao, Tr. 3000, 3008, 3014, 3081.

during the '517 patent prosecution was already known in the programming, erasing, and testing context before the date of invention.⁶²⁹

As to failure by others, ST asserts that there is none. According to ST, a paper describing the device embodying the prior art permanent inhibit of the '179 patent technology was published in a prestigious engineering journal and the product commercializing the '179 patent technology won the 1991 product of the year award from Electronic Design magazine.⁶³⁰ While SanDisk argues that the Toshiba example shows a failure of others, *i.e.* that Toshiba did not discover the benefits of permanent inhibit until 1994, ST counters that Toshiba discovered the benefits by 1990, as evidenced by Toshiba's own patent directed toward permanent inhibit (U.S. Patent No. 5,657,270).⁶³¹

Staff asserts that the analysis with respect to the issue of secondary considerations of non-obviousness for the '517 patent is basically the same as with respect to the '338 patent except that there has been a greater showing of commercial success, since SanDisk's NAND products practice the claimed invention, and there has been less showing of licensing, [

] ⁶³² Specifically, Staff asserts that none of the secondary considerations are clearly linked to the claimed invention. First, there has been no showing of a long-felt need coupled with a failure of others, [

] ⁶³³ Second, it is SanDisk's products in general,

⁶²⁹ RIB 80 citing *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 1379 (Fed. Cir. 2000) ("*Ecolochem*") (simultaneous invention directly tied to level of knowledge attributable to one of ordinary skill in the art).

⁶³⁰ RIB 80 citing RX-1378 (ISSCC paper); RX-1370 (Simko CV) at ST560-H 45924.

⁶³¹ RIB 80 citing RX-1402 (Ohuchi continuation file wrapper) at ST560 519088.

⁶³² SIB 82.

⁶³³ SRB 39 citing SFF 357-59.

not the claimed invention, that have gained industry recognition and awards.⁶³⁴ Third, although SanDisk's NAND products have been a commercial success, it does not inherently mean that there is a nexus to the claimed invention, especially when there is a strong showing of obviousness.⁶³⁵ Therefore, Staff asserts that SanDisk's weak showing of secondary considerations does not rebut ST's showing of obviousness.⁶³⁶

SanDisk counters ST's arguments regarding simultaneity of invention. According to SanDisk, simultaneity of invention does not occur when a single element is known in the prior art, but when several near-contemporaneous references disclose the entire invention. In addition, SanDisk asserts that permanent inhibition is not the invention of the '517 patent.⁶³⁷

The undersigned agrees with ST and Staff that SanDisk has failed to rebut ST's strong showing of obviousness. While there is no doubt that SanDisk's NAND flash memory products have been a "success," both commercially and via industry awards and accolades, SanDisk has not shown any nexus between that success as attributable to what is claimed invention in the '517 patent. In addition, SanDisk has not shown a long-felt need coupled with a failure by others [

]⁶³⁸ Accordingly,

the undersigned finds that SanDisk has failed to rebut ST's showing of obviousness of the '517

⁶³⁴ SRB 39 citing CFF 6846, 6848, 6851, 6853, 6855.

⁶³⁵ SRB 39 citing *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1371-72 (Fed. Cir. 2006) ("*Dystar*").

⁶³⁶ SIB 82; SRB 39 citing *Dystar*, 464 F.3d at 1371-72 (finding that evidence of secondary considerations, including "considerable" commercial success, were insufficient to overcome the evidence that the claim was obvious); *Sibia*, 225 F.3d at 1358 (holding that a weak showing of secondary considerations does not outweigh a clear showing of obviousness).

⁶³⁷ CRB 38-39 citing *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 449 (Fed. Cir. 1986) ("*Bausch & Lomb*").

⁶³⁸ Harari, Tr. at 354-55; RX-1802C (Pashley Witness Statement), at 235-36; CX-319/RX-712 (the '179 patent); RX-800 (JP100); RX-875 (GB '145).

patent.

4. Lack of Enablement/Inadequate Written Description/Best Mode

Based on the undersigned's above findings and conclusion that all of the asserted claims of the '517 patent are invalid as anticipated by the GB '145 reference and obvious based on the JP100 reference, in combination with the '179 patent and/or the '344 patent, the undersigned finds that it is not necessary to reach the issue of whether the '517 is invalid for lack of enablement, inadequate written description, or best mode as well.

E. Unenforceability

Based on the undersigned's above findings and conclusion that all of the asserted claims of the '517 patent are invalid as anticipated by the GB '145 reference and obvious based on the JP100 reference, in combination with the '179 patent and/or the '344 patent, the undersigned finds that it is not necessary to reach the issue of whether the '517 is unenforceable as well.

CONCLUSIONS OF LAW

1. The Commission has subject matter jurisdiction in this investigation.
2. The Commission has personal jurisdiction over ST.
3. ST's accused NAND products infringe claims 1, 3, 5, 6, 7, 8, and 10 of U.S. Patent No. 5,991,517 in violation of 35 U.S.C. § 271(a). In addition, all of ST's accused NAND products indirectly infringe these claims.
4. ST's accused NAND products do not infringe claims 12, 13, and 14 of U.S. Patent No. 5,991,517 in violation of 35 U.S.C. § 271(a).
5. ST's accused NOR products do not infringe claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 in violation of 35 U.S.C. § 271(a).
6. An industry in the United States exists with respect to SanDisk's products that is protected by claim 1, 3, 5, 6, 7, 8, 10, and 12 of U.S. Patent No. 5,991,517, as required by 19 U.S.C. § 1337(a)(2) and (3).
7. An industry in the United States does not exist with respect to SanDisk's products that is protected by any claim of U.S. Patent No. 5,172,338, as required by 19 U.S.C. § 1337(a)(2) and (3).
8. Claims 1, 6, and 10 of U.S. Patent No. 5,991,517 are invalid under 35 U.S.C. § 102 for anticipation based on the GB '145 prior art reference.
9. Claims 1, 3, 5, 6, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 are not invalid under 35 U.S.C. § 102 for anticipation based the '179 patent.
10. Claims 1, 6, and 10 of U.S. Patent No. 5,991,517 are not invalid under 35 U.S.C. § 102 for anticipation based the M293 prior art reference.

11. Claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 are invalid under 35 U.S.C. § 103 for obviousness based on JP100 by itself, or in combination with the '179 patent and/or the '344 patent.
12. Claims 1, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 are not invalid under 35 U.S.C. § 103 for obviousness based on JP100 in combination with the '871 patent and/or the '541 patent.

INITIAL DETERMINATION

Based on the foregoing opinion, findings of fact, conclusions of law, the evidence, and the record as a whole, and having considered all pleadings and arguments, including the proposed findings of fact and conclusions of law, it is the Administrative Law Judge's Initial Determination that a violation of Section 337 of the Tariff Act of 1930, as amended, has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 1, 3, 5, 6, 7, 8, 10, 12, 13, and 14 of U.S. Patent No. 5,991,517 and has not been found in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain NOR and NAND flash memory devices and products containing same, in connection with claims 8, 9, 11, 27, 28, 32, 50, 51, and 64 of U.S. Patent No. 5,172,338. Furthermore, the Administrative Law Judge hereby determines that a domestic industry in the United States exists that practices U.S. Patent No. 5,991,517 and does not exist that practices U.S. Patent No. 5,172,338.

The Administrative Law Judge hereby CERTIFIES 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 by the Administrative Law Judge; and further the exhibits accepted into evidence in this investigation as listed in the attached exhibit lists.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review 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.

RECOMMENDED DETERMINATION ON REMEDY AND BOND

Pursuant to Commission Rules 210.36(a) and 210.42(a)(1)(ii), the Administrative Law Judge is to consider evidence and argument on the issues of remedy and bonding and issue a recommended determination thereon.

VI. Remedy and Bonding

A. Limited Exclusion Order

Under Section 337(d), the Commission may issue either a limited or a general exclusion order. A limited exclusion order instructs the U.S. Customs Service 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 U.S. Customs Service to exclude from entry all articles that are covered by the patent at issue, without regard to source. SanDisk requests that a limited exclusion order be issued that prohibits the importation of all infringing ST chips, as well as all downstream products which incorporate those chips, including memory cards, USB drives, and cell phones.⁶³⁹ SanDisk further argues that because the accused chips are produced abroad by ST's contractors, the exclusion order should extend to all accused chips manufactured and imported by or on behalf of ST in order to prevent evasion. According to SanDisk, such an order should include those accused chips manufactured and imported by its affiliated companies, parents, subsidiaries, licensees, contractors, joint venturers and other related business entities, and their successors or assigns.⁶⁴⁰

ST asserts that SanDisk's expert, Mr. Napper, only analyzed three categories of downstream

⁶³⁹ CIB 94-95.

⁶⁴⁰ CIB 95.

products—removable memory cards, USB drives, and cell phones—and that any request by SanDisk to exclude other types of downstream products should be rejected.⁶⁴¹

Staff asserts that the Commission should not issue an exclusion order that covers all downstream products, because the range of products that contain or could potentially contain a flash memory chip is enormous, which would place an undue burden on Customs that would disrupt legitimate trade.⁶⁴² Staff also asserts that the exclusion order should not extend to cell phones or DSL residential gateways.⁶⁴³ Staff does, however, agree that the Commission should issue an exclusion order that covers downstream products such as flash cards and USB drives.⁶⁴⁴

B. Downstream Products

Under Section 337, the Commission has broad discretion in selecting the form, scope, and extent of the remedy in a Section 337 proceeding. If the Commission finds a violation of Section 337, the Commission may issue an exclusion order that not only covers the articles found to infringe, but also covers “downstream products,” which are products that incorporate the infringing articles as components. The Commission has identified relevant factors to be considered in deciding whether to include downstream products in an exclusion order, commonly referred to as the *EPROMs* factors, including: (1) the value of the infringing articles compared to the value of the downstream products in which they are incorporated; (2) the identity of the manufacturer of the downstream products, i.e., whether it can be determined that the downstream products are manufactured by the respondent or by a third party; (3) the incremental value to the complainant of

⁶⁴¹ RIB 95.

⁶⁴² SIB 95.

⁶⁴³ SIB 95.

⁶⁴⁴ SIB 96-98.

the exclusion of downstream products; (4) the incremental detriment to respondents of exclusion of such products; (5) the burdens imposed on third parties resulting from exclusion of downstream products; (6) the availability of alternative downstream products that do not contain the infringing articles; (7) the likelihood that the downstream products actually contain the infringing articles and are thereby subject to exclusion; (8) the opportunity for evasion of an exclusion order that does not include downstream products; (9) the enforceability of an order by Customs; and any other factors the Commission determines to be relevant.⁶⁴⁵ In deciding whether to exclude downstream products, the Commission balances all of the above factors and nothing in the case law puts the burden of proof on any particular party with respect to the *EPROMs* factors.

SanDisk requests that the exclusion order not only cover the allegedly infringing chips that are found to infringe, but also cover all “downstream products” that incorporate the infringing chips as components. Examples of the types of “downstream products” that SanDisk wishes to exclude are memory cards, USB drives, cell phones, and DSL residential gateways. SanDisk contends that in order to have complete and effective relief, any limited exclusion order must include downstream products. SanDisk concludes that the *EPROMs* factors weigh in favor of an exclusion order.⁶⁴⁶ ST asserts that the exclusion order should not extend to any downstream products,⁶⁴⁷ while Staff asserts that the exclusion order should only extend to downstream products such as flash cards and USB drives.⁶⁴⁸

⁶⁴⁵ See *Certain Erasable Programmable Read-Only Memories*, Inv. No. 337-TA-276, USITC Pub. 2196, Comm’n Op. at 124-126, 136 (May 1989) (“*Certain EPROMs*”) *aff’d sub nom. Hyundai Elec. Indus. Co. v. U.S. Int’l Trade Comm’n*, 899 F.2d 1024 (Fed. Cir. 1990) (“*Hyundai*”).

⁶⁴⁶ CIB 94-98.

⁶⁴⁷ RIB 95.

⁶⁴⁸ SIB 96-98.

1. Factor 1: The value of the infringing articles compared to the value of the downstream products in which they are incorporated

SanDisk asserts that, with respect to factor 1, the value of the infringing ST flash chips is high compared to the value of the downstream products in which they are incorporated, both qualitatively and quantitatively. For example, SanDisk asserts that infringing ST chips enable the very function of memory cards, namely data transfer and storage, as well as the enhanced features driving demand for the newest and most advanced cell phones.⁶⁴⁹

ST asserts that, according to the evidence from third-party cell phone makers, flash chips only represent a small fraction of the value of the phones in which they are used, *i.e.* between 4.3-5.6%. ST also asserts that the flash chips only provide a small fraction of the overall functionality of the cell phone, the essential feature being to make telephone calls.⁶⁵⁰

Staff asserts that the first factor weighs in favor of an exclusion order covering downstream products because memory is an essential component in a flash card and USB drive, and that the memory constitutes a high proportion of the final cost of the device.⁶⁵¹

The undersigned agrees with SanDisk and Staff that the first *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion order, on both a qualitative and quantitative basis because the evidence shows that flash memory is an essential component in a flash card and USB drive, and also constitute a high portion of the flash card and USB drive cost. The undersigned agrees with ST and Staff, however, that the first *EPROMs* factor weighs against including downstream products such as cellular telephones and DSL residential

⁶⁴⁹ CIB 96.

⁶⁵⁰ RIB 95.

⁶⁵¹ SIB 96 citing CX-2234C (Napper Direct) at 65-66.

gateways, because the flash memory only provides a small fraction of the overall functionality of these devices. Accordingly, the first *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion order.

2. Factor 2: The identity of the manufacturer of the downstream products (i.e., are the downstream products manufactured by the party found to have committed the unfair act, or by third parties)

SanDisk asserts that, with respect to factor 2, the identify of many downstream product manufacturers has been confirmed during the investigation. SanDisk asserts that the following manufacturers incorporate infringing ST chips into their products and then import those products into the United States: []⁶⁵²

ST asserts that, except for very limited sales of memory cards, ST does not manufacture any of the downstream products and that the exclusion order would primarily affect third parties, who SanDisk chose not to name as respondents.⁶⁵³

Staff asserts that the second factor weighs in favor of an exclusion order covering downstream products because ST makes flash cards and works with certain customers to make USB drives.⁶⁵⁴

The undersigned agrees ST that the second *EPROMs* factor weighs against including downstream products in the exclusion because SanDisk, knowing the identity of the manufacturers and customers that incorporate ST's chips into their products, chose not to name these third parties

⁶⁵² CIB 96-97.

⁶⁵³ RIB 95-96.

⁶⁵⁴ SIB 96 citing Casagrande, Tr. 1510-11; CX-383C (NAND Flash presentation) at 115776-81; CX-486C (ST NAND Flash & Storage Media business plan) at 36355.

as respondents.⁶⁵⁵ Accordingly, the second *EPROMs* factor weighs against including downstream products such as flash cards and USB drives in the exclusion order.

3. Factor 3: The incremental value to the complainant for excluding the downstream products

SanDisk asserts that, with respect to factor 3, only an exclusion order which covers downstream products will provide full and effective relief in this investigation. According to SanDisk, flash memory chips cannot function without first being installed into a downstream products. SanDisk acknowledges that some infringing chips are imported into the U.S. separately, but that the vast majority of infringing ST chips enter the United States incorporated in downstream products.⁶⁵⁶

ST asserts that an exclusion order that only covers ST's flash memory chips and flash memory cards would provide effective and adequate relief to SanDisk. According to ST, from January to June 2006, ST sold[] units of the accused chips in the U.S., which is valued at []⁶⁵⁷ ST argues that there is little evidence that a significant quantity of downstream products containing ST's accused chips are actually imported into the U.S. because SanDisk did not quantify the volume of such imports.⁶⁵⁸ According to ST, its worldwide market share is relatively small. For example, ST's worldwide market share in NAND is []⁶⁵⁹ For NOR, ST's

⁶⁵⁵ See *Certain Baseband Processor Chips and Chipsets, Transmitter and Receiver (Radio) Chips, Power Control Chips, and Products Containing Same, Including Cellular Telephone Handsets*, Inv. No. 337-TA-543, Initial Determination at 275-76 (October 10, 2006) (“*Certain Baseband Processor Chips*”).

⁶⁵⁶ CIB 97.

⁶⁵⁷ RIB 96 citing RX-1763C (ST flash chips North America 2006); RX-1800C (Mulhern Direct) at Q. 82, p. 15.

⁶⁵⁸ RIB 96.

⁶⁵⁹ RIB 96 citing RX-1738 (iSuppli Corp. Table “Q2 NAND market share”); RX-1800C (continued...)

worldwide market share is [] however, ST asserts that only a fraction of those sales are for MLC NOR chips, which SanDisk accuses in this investigation.⁶⁶⁰ Furthermore, ST asserts that if third-parties were forced to find an alternative flash memory supplier, SanDisk would reap no benefit because SanDisk does not supply chips to manufacturers and does not produce or sell NOR flash chips at all; therefore, SanDisk would not make any additional sales (or receive any additional licensing revenue) if the exclusion order covered downstream products.⁶⁶¹

Staff asserts that the third factor weighs in favor of an exclusion order covering downstream products because SanDisk would benefit from an exclusion order covering flash cards and USB drives because SanDisk itself makes directly competitive products.⁶⁶²

The undersigned finds that the third *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion because without an exclusion order covering flash cards and USB drives, SanDisk will be deprived from receiving full and effective relief in this investigation. Accordingly, the third *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion order.

4. Factor 4: The incremental detriment to respondents if the products are excluded

SanDisk asserts that, with respect to factor 4, there is no evidence that ST would suffer undue harm if the Commission's order excludes downstream products containing the infringing chips. According to SanDisk, ST is a large, diversified company with a broad product line and that ST's

⁶⁵⁹(...continued)
(Mulhern Direct) at Q. 92, p. 17.

⁶⁶⁰ RIB 96 citing RX-1739 (iSuppli Corp. Table "NOR flash rankings"); RX-1800C (Mulhern Direct) at Q. 92, p. 17.

⁶⁶¹ RIB 96.

⁶⁶² SIB 96 citing Harari, Tr. 285-86; CX-2234C (Napper Direct) at 70.

NAND and MLC NOR sales constitute a relatively small proportion of its business. SanDisk contrasts this with its own business, the core of which consists of flash memory products. Furthermore, SanDisk asserts that there is no evidence that downstream ST customers would halt purchases of ST's flash memory chips, rather than simply aggregate products that contain the infringing chips, if a downstream exclusion order were to issue.⁶⁶³

ST asserts that an exclusion order covering downstream products would harm ST because an ST customer, being faced with the possibility of an exclusion order in the U.S., may go to other suppliers not only for the U.S. market, but for all markets. For example, ST asserts that [

] in order to comply with the exclusion order, and that [

] if such were the case.⁶⁶⁴

Staff asserts that the fourth factor weighs against an exclusion order covering downstream products because ST will suffer some detriment, but that it would be relatively small compared to the benefit to SanDisk.⁶⁶⁵

The undersigned agrees with ST and Staff that the fourth *EPROMs* factor weighs against including downstream products in the exclusion because of the incremental detriment to ST, including decreased sales and possible loss of customer base to ST. Accordingly, the fourth *EPROMs* factor weighs against including downstream products in the exclusion order.

⁶⁶³ CIB 97.

⁶⁶⁴ RIB 97.

⁶⁶⁵ SIB 97 citing CX-2234C (Napper Direct) at 72.

5. Factor 5: The burden borne by third parties as a result of excluding downstream products

SanDisk asserts that, with respect to factor 5, any burdens imposed on third parties due to the exclusion of downstream products would be minimal because the third parties could simply substitute the accused chips with chips manufactured by others.⁶⁶⁶

ST asserts that third party manufacturers, as well as exporters and distributors, would incur additional costs to identify and segregate products that have already been manufactured with ST chips, which weighs against the issuance of an exclusion order covering downstream products.⁶⁶⁷

Staff asserts that the fifth factor weighs against an exclusion order covering downstream products because there will be a burden on third parties, although Staff finds that such burden would be limited due to the natures of the products covered.⁶⁶⁸

The undersigned agrees with ST and Staff that the fifth *EPROMs* factor weighs against including downstream products in the exclusion because of the financial burden born by third parties, such as identifying and reconfiguring products if another chip manufacturer is used. Accordingly, the fifth *EPROMs* factor weighs against including downstream products in the exclusion order.

6. Factor 6: The availability of alternative downstream products that do not contain the infringing articles

SanDisk asserts that, with respect to factor 6, numerous downstream products that do not contain ST's infringing chips are available.⁶⁶⁹ ST does not address the sixth factor. Staff asserts that the sixth factor weighs in favor of an exclusion order covering downstream products because there

⁶⁶⁶ CIB 97.

⁶⁶⁷ RIB 97.

⁶⁶⁸ SIB 97.

⁶⁶⁹ CIB 97.

are many chips and downstream products that could replace ST's excluded products.⁶⁷⁰

The undersigned agrees with SanDisk and Staff that the sixth *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion because there is a lot of competition in the flash memory chip industry with many alternative component suppliers available. Accordingly, the sixth *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion order.

7. Factor 7: The likelihood that the downstream products actually contain the infringing article and, thus, are subject to the exclusion order

SanDisk asserts that, with respect to factor 7, ST and its customers sell and import into the United States, downstream products that contain infringing ST flash memory chips. According to SanDisk the number of imports is increasing rapidly and will likely continue in the future.⁶⁷¹

ST asserts that it only supplies [] of the world's NAND market, while supplying [] of the world's NOR market. According to ST, a large portion of the NOR market, however, includes chips that have not been accused in this investigation. Therefore, ST asserts that the likelihood that a downstream product will contain the accused chip is small and the exclusion order should not extend to downstream products.⁶⁷²

Staff asserts that the seventh factor weighs in favor of an exclusion order covering downstream products because there is evidence of downstream products, such as flash memory cards and USB drives, that incorporate the accused chips.⁶⁷³

The undersigned agrees with SanDisk and Staff that the seventh *EPROMs* factor weighs in

⁶⁷⁰ SIB 96 citing CX-2234C (Napper Direct) at 72-74.

⁶⁷¹ CIB 97-98.

⁶⁷² RIB 98.

⁶⁷³ SIB 96 citing CX-2234C (Napper Direct) at 74-75; []

favor of including downstream products such as flash cards and USB drives in the exclusion because ST has a clear market share in both NAND and NOR products. Accordingly, the seventh *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion order.

8. Factor 8: The opportunity for evasion of an exclusion order

SanDisk asserts that, with respect to factor 8, ST could easily evade an exclusion order that does not prohibit the importation of downstream products simply by further directing its sales energies to customers who make their downstream products abroad.⁶⁷⁴

ST asserts that it sells a significant quantity of its flash memory chips to U.S. customers, including ST's three distributors. According to ST, these distributors have alternative chip suppliers and would have no incentive to attempt to evade an exclusion order by purchasing end products in lieu of flash memory chips.⁶⁷⁵

Staff asserts that the eighth factor weighs in favor of an exclusion order covering downstream products because there is an opportunity for evasion of the order because the majority of ST's sales are made abroad to companies that incorporate the chips into downstream products.⁶⁷⁶

The undersigned agrees with SanDisk and Staff that the eighth *EPROMs* factor weighs in favor of including downstream products such as flash cards and USB drives in the exclusion because without an exclusion order covering flash cards and USB drives, there is an opportunity for customers to incorporate the accused infringing chips into downstream products. Accordingly, the eighth *EPROMs* factor weighs in favor of including downstream products such as flash cards and

⁶⁷⁴ CIB 98.

⁶⁷⁵ RIB 98.

⁶⁷⁶ SIB 97 citing CX-2234C (Napper Direct) at 76-78; CX-2296C (Napper Rebuttal) at 25.

USB drives in the exclusion order.

9. Factor 9: The enforceability of an order by Customs

SanDisk asserts that, with respect to factor 9, Customs will be able to enforce an exclusion order which covers downstream products because ST labels it infringing chips, making them easily identifiable as ST chips. SanDisk asserts that this labeling will allow Customs to differentiate ST's flash memory chips from those of other manufacturers. SanDisk asserts that, it would be beneficial if the limited exclusion order included a certification provision from importers of downstream products that the imported products do not contain infringing ST flash memory chips.⁶⁷⁷

ST asserts that Customs would face significant burdens in enforcing a downstream exclusion order. According to ST, Customs would need to open a memory card or phone, which would destroy the product in the process. ST also asserts that [

] which would make it difficult to identify if the chip was an ST chip.⁶⁷⁸

Staff asserts that the ninth factor weighs against an exclusion order covering downstream products because there will be a burden on Customs, however, it would be limited if a certification provision were included in the exclusion order.⁶⁷⁹

The undersigned agrees with ST and Staff that the ninth *EPROMs* factor weighs against including downstream products in the exclusion because of the significant burdens placed on Customs and importers. Accordingly, the ninth *EPROMs* factor weighs against including downstream products in the exclusion order.

⁶⁷⁷ CIB 98.

⁶⁷⁸ RIB 98-99.

⁶⁷⁹ SIB 97.

10. Conclusion

The undersigned finds that *EPROMs* factors one, three, six, seven, and eight weigh in favor of including downstream products such as flash cards and USB drives in the exclusion order, while *EPROMs* factors two, four, five, and nine weigh against including downstream products such as flash cards and USB drives in the exclusion order. After considering all of the parties' arguments, the undersigned finds that, after balancing all of the above factors, the incremental benefit to SanDisk outweighs the burden that will be borne by ST and third parties if downstream products such as flash cards and USB drives are included in the exclusion order.

As to downstream products such as cellular telephones and DSL residential gateways, however, the undersigned finds that *EPROMs* factor one weighs heavily against including these downstream products in the exclusion order because the flash memory chip is not a significant portion of the downstream product, either quantitatively or qualitatively.⁶⁸⁰ In addition, *EPROMs* factors two, four, five, and nine also weigh against including these downstream products in the exclusion order. Including cellular telephones and DSL residential gateways in the exclusion order has the potential to greatly expand the coverage of the exclusion order, which increases the risk of interfering with legitimate commerce. The evidence does not show that it is necessary for the exclusion order to cover these types of downstream products because the risk that an exclusion order covering these types of downstream products would interfere with legitimate commerce far outweighs the incremental benefit to SanDisk in excluding these types of downstream products. Therefore, the undersigned does not recommend that the exclusion order include downstream

⁶⁸⁰ See *Certain Zero-Mercury-Added Alkaline Batteries, Parts Thereof, and Products Containing Same*, Inv. No. 337-TA-493, Initial Determination at 225 (June 2, 2004) ("*Certain Zero-Mercury-Added Alkaline Batteries*"), rev'd on other grounds.

products such as cellular telephones and DSL residential gateways.

C. Cease and Desist Order

Under Section 337(f)(1), the Commission may issue a cease and desist order in addition to, or instead of, an exclusion order. Cease and desist orders are warranted primarily when the respondent maintains a commercially significant inventory of the accused products in the United States.⁶⁸¹

SanDisk requests a cease and desist order against ST because ST maintains a commercially significant inventory of accused products in the United States.⁶⁸² ST concedes that it maintains a commercially significant U.S. inventory of approximately [] accused chips.⁶⁸³ Staff agrees that ST maintains a commercially significant U.S. inventories of the accused chips, warranting a cease and desist order.⁶⁸⁴

The undersigned agrees that the evidence shows that ST maintains significant inventories of accused products in the United States and that a cease and desist order is warranted.

D. Bond During Presidential Review Period

If the Commission enters an exclusion order or cease and desist order, parties may continue to import and sell their products during the pendency of the Presidential review under a bond in an amount determined by the Commission to be “sufficient to protect the Complainants from any injury.”⁶⁸⁵ SanDisk requests a bond in the amount of 100% of the entered value of accused ST

⁶⁸¹ *Certain Crystalline*, 15 U.S.P.Q.2d at 1277-79.

⁶⁸² CIB 98.

⁶⁸³ RIB 99.

⁶⁸⁴ SIB 98-99.

⁶⁸⁵ 19 U.S.C. § 1337(e); 19 C.F.R. § 210.50(a)(3).

chips.⁶⁸⁶

ST requests a bond of 5% based on SanDisk's licensing revenue. According to ST, because SanDisk does not supply flash memory chips, and does not sell any NOR products at all, a reasonable royalty rate adequately protects its sole interest in licensing revenues. ST asserts that SanDisk's licenses command royalties of between [

] ⁶⁸⁷

Staff notes that, in the previous 526 investigation, ALJ Luckern recommended a bond of 100%. For this investigation, however, Staff recommends a bond based on a reasonable royalty rate of 10%, [] According to Staff, SanDisk has testified that[

]Therefore, Staff finds a bond that is based on a reasonable royalty rate to adequately protect SanDisk against any lost licensing revenues.⁶⁸⁸

The Commission frequently sets the bond by attempting to eliminate the difference in sales prices between the patented domestic product and the infringing product.⁶⁸⁹ In the absence of reliable price information, the Commission has used other methods to determine an appropriate bond. For example, where a price comparison is unworkable, the Commission has determined that a bond of 100% is appropriate.⁶⁹⁰ In other instances where a direct comparison between a patentee's product and the accused product was not possible, the Commission has set the bond at a reasonable

⁶⁸⁶ CIB 99.

⁶⁸⁷ RIB 99.

⁶⁸⁸ SIB 99-100.

⁶⁸⁹ See *Certain Microsphere Adhesives*, Commission Opinion at 24.

⁶⁹⁰ See, e.g., *Certain Wind Turbines*, Comm'n Op. at 27-28 and 40.

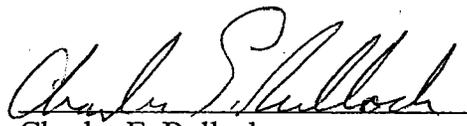
royalty rate.⁶⁹¹

In this case, the parties did not introduce any evidence of current sales or pricing information that would permit the undersigned to determine a price differential. The parties did, however, introduce evidence of a reasonable royalty rate. The undersigned finds Staff's arguments persuasive and recommends a bond in the amount of 10% of entered value of both the chips themselves and of downstream products.

Within seven days of the date of this document, each party shall submit to the office of the Administrative Law Judge a statement as to whether or not it seeks to have any portion of this document deleted from the public version. The parties' submissions must be made by hard copy by the aforementioned date.

Any party seeking to have any portion of this document deleted from the public version thereof must submit to this office a copy of this document with red brackets indicating any portion asserted to contain confidential business information. The parties' submission concerning the public version of this document need not be filed with the Commission Secretary.

SO ORDERED.


Charles E. Bullock
Administrative Law Judge

⁶⁹¹ See, e.g., *Certain Digital Satellite System (DSS) Receivers and Components Thereof*, Inv. No. 337-TA-392, U.S.I.T.C. Pub. No. 3418, Initial and Recommended Determinations at 245, vacated on other grounds, Comm'n Determination (May 13, 1999), 2001 WL 535427 (U.S.I.T.C., October 20, 1997) ("*Certain DSS Receivers*").