6481 Orangethorpe Ave., Suite 6
Buena Park, California 90620
Butterfly Print Image Corp. Ltd.
Units 811-812, 8/F Park Sun Building
103-107 Wo Yi Hop Road
Kwai Chung, N.T., Hong Kong

Ink Lab (H.K.) Co., Ltd.
Flat A 11/F
Lucky Horse Industrial Building
64 Tong Mi Road, Mongkok
Kowloon, Hong Kong

Nectron International, Ltd.
725 Park Two
Sugar Land, Texas 77478

Mipo International Ltd.
Flat B, 11F, Wong Tze Building
71 Hoe Yuen Road
Kwun Tong, Kowloon, Hong Kong

Mipo America Ltd.
3100 N.W. 72nd Avenue # 106
Miami, Florida 33122

Nine Star Image Co. Ltd.
No. 63 Mingzhubei Road, Xiangzhou District
Zhuhai, Guangdong, China 519 075

Nine Star Technology Company Ltd.
4620 Mission Boulevard
Montclair, California 91763

Town Sky Inc.
5 South Linden Avenue, Suite 4
South San Francisco, California 94080

Zhuhai Gree Magneto - Electric Co. Ltd.
No. 205, West Shi Hua Road
Zhuhai City, Guangdong Province, China 519020

MMC Consumables Inc.

20456 Carrey Road
Walnut, California 91789

Tully Imaging Supplies Ltd.
Room 902, 9/F
Island Place Tower
510 King's Road
North Point, Hong Kong

Inkjetwarehouse.com Inc.
106 Powder Mill Road
Canton, Connecticut 06019

Wellink Trading Co., Ltd.
Avn. Venceslau Morais S/N
11-P, Edf. C. Ind.,
Keck Seng Building 2
Macao, China

Ribbon Tree (Macao) Trading Co., Ltd.
Avn. Venceslau Morais S/N
11-P, Edf. C. Ind.,
Keck Seng Building 2
Macao, China

Ribbon Tree (USA) Inc.
dba Cana-Pacific Ribbons Inc.
6920 Salashan Parkway, Unit D107
Ferndale, Washington 98248

Apex Distributing Inc.
6920 Salashan Parkway, Unit D107
Ferndale, Washington 98248

Artech GMBH
Feldbachacker 10
D-44 149, Dorfmund, Germany

Ink Tec Co. Ltd.
1124, Shingil-Dong Danwon-Gu
Ansan-City, Kyungki-Do
425-839, Korea

Ink Tec America Corporation
7020 Troy Hill Drive, Suite H
Elkridge, Maryland 21075

Dataproducts USA LLC
2001 Anchor Court
Thousand Oaks, California 91320

Gerald Chamales Corp.
dba Rhinotek Computer Products
2301 E. Del Amo Blvd.
Compton, California 90220

Master Ink Co., Ltd.
604 Po Lung Centre
11 Wang Chiu Road
Kowloon Bay
Hong Kong

AcuJet U.S.A., Inc.
128 S. 6th Avenue
City of Industry, California 91746

On April 28, 2006, the administrative law judge in his Order No. 4 set June 25, 2007, as the target date for completion of the investigation which meant that the due date for the final initial determination was March 23.[1] On March 20 the administrative law judge in his Order No. 31 extended the target date to July 30 which meant that the due date for the final initial determination is March 30.

On April 12, 2006, Epson filed a motion to amend its complaint to add allegations of infringement of claim 1 of U.S. Patent No. 7,008,053 and claims 21, 45, 53 and 54 of U.S. Patent No. 7,011,397. On May 3, 2006, an initial determination issued granting Epson's motion. On May 26, 2006, the Commission determined not to review the initial determination, thereby

[1] The notice of investigation was published in the Federal Register on March 23, 2006 (71 Fed. Reg. 14720-21, No. 71.)

adopting it.

Regarding respondents found in default, on June 26, 2006, an initial determination (Order No. 12) issued finding respondents Glory South Software Manufacturing Inc., Butterfly Print Image Corp. Ltd., Mipo International Ltd., Mipo America Ltd., and AcuJet U.S.A., Inc. in default. On July 19, 2006, the Commission determined not to review Order No. 12 and thus adopted it. On October 3, 2006, an initial determination (Order No. 17) issued finding respondents Tully Imaging Supplies, Ltd., Wellink Trading Co., Ltd. and Ribbon Tree Trading Co., Ltd. in default. On October 25, 2006, the Commission determined not to review Order No. 17, thereby adopting it.

Regarding respondents terminated through issuance of consent orders, see FF 62-108.

On October 12, 2006, Epson moved for summary determination as to respondent Ninestar Technology Co. Ltd.'s Eighth Affirmative Defense of Lack of Personal Jurisdiction. The administrative law judge treated the motion as a motion to strike and on November 6, 2006, issued Order No. 20 striking said affirmative defense. On November 17, 2006, Epson moved for summary determination as to the affirmative defenses of equitable estoppel and patent misuse. The administrative law judge treated said motion as a motion to strike, and on December 20, 2006, issued Order No. 22 striking the affirmative defenses of equitable estoppel and patent misuse.

On November 9, 2006, Epson moved for summary determination that its domestic activities satisfy the economic prong of the domestic industry requirement. On December 21, 2006, an initial determination issued granting Epson's motion for summary determination and finding that Epson's domestic activities satisfy the economic prong of the domestic industry

requirement. On January 17, 2007, the Commission determined not to review the initial determination, thereby adopting it.

Prior to the evidentiary hearing the following motions in limine were filed:

565-59	Complainants Epson Portland Inc., Epson America, Inc. And Seiko Epson Corporation's Motion in Limine to Preclude Evidence or Argument Regarding Certain Alleged Prototype Ink Cartridges
565-60	Complainants' Motion In Limine To Exclude Certain Evidence And Argument Regarding Anticipation, Obviousness or Belatedly Identified Prior Art
565-62	Complainants' Motion in Limine To Preclude Respondents From Making Certain Contentions
565-63	Complainants' Motion In Limine To Exclude Evidence and Argument Regarding the Person America Class Action Lawsuit And Unclean Hands Defense
565-64	Complainants' Motion In Limine to Preclude Respondents From Relying on a Newly Identified Witness At The Evidentiary Hearing

Motion No. 565-59 was mooted in view of JX-37. Certain portions of Motion No. 565-60 were mooted and other portions denied. (Tr. at 13-15.) Referring to Motion No. 565-62, certain portions were denied and other portions mooted. (Tr. at 15-22.) Motion No. 565-63 was mooted (Tr. at 22-25; see also certain exhibits admitted into evidence with no objection.) Motion No. 565-64 was denied. (Tr. at 25.)

The evidentiary hearing took place before the administrative law judge on January 17, 18, 19, 20, 22, 23 and 24, 2007.

The respondents that participated in the hearing were respondents Ninestar Technology Co., Ltd. (Ninestar Zhuhai), Ninestar Technology Company Ltd. (Ninestar U.S.), Town Sky Inc., and Dataproducts USA, LLC (active respondents). The active respondents filed extensive post

hearing submissions, and were represented by the same counsel. Respondents Zhuhai Gree Magneto-Electric Co., Ltd. and MMC Consumables, Inc. (MMC respondents) also participated at the hearing but were represented by different counsel. The MMC respondents' post hearing submissions were minimal.[2]

The Final Initial and Recommended Determinations herein are based on the record compiled at the hearing and the exhibits admitted into evidence. The administrative law judge has also taken into account his observation of the witnesses who appeared before him during the hearing. Proposed findings of fact submitted by the parties not herein adopted, in the form submitted or in substance, are rejected as either not supported by the evidence or as involving immaterial matters and/or as irrelevant. Certain findings of fact included herein have references to supporting evidence in the record. Such references are intended to serve as guides to the testimony and exhibits supporting the findings of fact. They do not necessarily represent complete summaries of the evidence supporting said findings.[3] The matter is now ready for decision.

---

[2] On December 12, 2006, complainants Epson and the MMC respondents had filed a Joint Stipulations which stated, among other things, that said respondents do not contest that their accused products infringe one or more claims of at least one of the asserted patents and that they have imported and/or sold the accused products after importation.

[3] On February 12, 2007, complainants moved for judicial notice of certain dictionary definitions. (Motion Docket No. 565-66.) The active respondents, in a response dated February 21 opposed said motion. Said motion is granted. However Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005), is controlling. See Section V infra.

On March 6, 2007, the active respondents moved for leave to submit an accompanying Sur-Reply. (Motion Docket No. 565-67.) Said motion was granted and complainants and the staff were given the opportunity to respond to said motion.

II. Parties And Patents In Issue

See FF 1-108 for parties. Also the table below summarizes the present status of each respondent:

	Respondent	Status
1.	Glory South Software Manufacturing, Inc.	Default
2.	Butterfly Print Image Corp. Ltd.	Default
3.	Ink Lab (H.K.) Co. Ltd.	Settlement and Consent Order
4.	Nectron International, Ltd.	Settlement and Consent Order
5.	Mipo International Ltd.	Default
6.	Mipo America Ltd.	Default
7.	Ninestar Technology Co., Ltd. (previously Nine Star Images Co. Ltd.)	Participated at evidentiary hearing
8.	Nine Star Technology Company Ltd.	Participated at evidentiary hearing
9.	Town Sky Inc.	Participated at evidentiary hearing
10.	Zhuhai Gree Magneto – Electric Co. Ltd.	Participated at evidentiary hearing, but not contesting infringement
11.	MMC Consumables Inc.	Participated at evidentiary hearing, but not contesting infringement
12.	Tully Imaging Supplies Ltd.	Default
13.	Inkjetwarehouse.com Inc.	Settlement and Consent Order
14.	Wellink Trading Co., Ltd.	Default
15.	Ribbon Tree (Macao) Trading Co., Ltd.	Default
16.	Ribbon Tree (USA) Inc.	Unilateral Consent Order
17.	Apex Distributing Inc.	Unilateral Consent Order
18.	Artech GMBH	Settlement and Consent Order

19.	Ink Tec Co., Ltd.	Settlement and Consent Order
20.	Ink Tec America Corporation	Settlement and Consent Order
21.	Dataproducts USA LLC	Participated at evidentiary hearing
22.	Gerald Chamales Corp. dba Rhinotek Computer Products	Settlement and Consent Order
23.	Master Ink Co.	Unilateral Consent Order
24.	AcuJet U.S.A., Inc.	Default

Referring to the patents in issue, as set forth infra said patents have been broken down into the following categories: the Suzuki Sponge family (the '957 patent, the '439 patent, the '377 patent, the '148 patent and the '472 patent), the chip or contact family (the '917 and '902 patents), the packing/sealing member patent (the '401 patent), the lever and chip patent (the '422 patent), the retaining member patent (the '053 patent) and the valve patent (the '397 patent).

The active respondents and the MMC respondents are accused of infringing all of the asserted claims of the Suzuki patents, with the exception of certain claims directed to the requirement of a low pressure fill, i.e. claim 165 of the '439 patent and claims 29, 31, 34 and 38 of the '472 patent (the low pressure fill claims).[4] The non-active respondents are accused of infringing all asserted claims of the Suzuki patents, including the low pressure fill claims.

All of the respondents, including Master Ink, Apex and Ribbon Tree USA, have been accused of infringing claim 1 of the packing/sealing member '401 patent.

Referring to the chip or contact family, all of the respondents have been accused of

[4] The claims from the Suzuki patents asserted against the active respondents and the MMC respondents are as follows: claim 7 of the '957 patent; claims 18, 81, 93, 149 and 164 of the '439 patent; claims 83 and 84 of the '377 patent; and claims 19 and 20 of the '148 patent.

infringing claims 1, 2, 3 and 9 of the '917 patent. Also all of the respondents have been accused of infringing claims 1, 31 and 34 of the '902 patent which respondents include Master Ink/Apex and Ribbon Tree USA.

Referring to the '422 patent, which has been characterized as the lever and chip patent, all respondents have been accused of infringing claims 1, 10 and 14 of the said patent.

As for the '053 patent, which has been referred to as the retaining member patent, all of the respondents have been accused of infringing claim 1 of said patent.

Referring to the '397 valve patent, respondents Mipo, Mipo America, Tully, Wellink, Ribbon Tree Macao, Inkjetwarehouse, Apex and Ribbon Tree USA have been accused of infringing claims 21, 45, 53 and 54 of said patent.

III. Jurisdiction

The administrative law judge finds that the complaint and notice of investigation state a cause of action under 337 of the Tariff Act of 1930, as amended. Moreover, the importation requirement has been satisfied because each respondent in this investigation imports, sells for importation into the United States and/or sells after importation into the United States infringing aftermarket ink cartridges for use with Epson printers. (CFF I.B.5, 9, 12, 19, 22, 25, 28, 32, 36, 39, 43, 47, 52, 57, 62, 66, 70, 75, 79, 83, 87, 91, 95, 99 (undisputed).) Thus, the Commission has in rem jurisdiction over the subject matter of this investigation. See Certain Automated Mechanical Transmission Systems for Medium-Duty and Heavy-Duty Trucks and Components Thereof, Inv. No. 337-TA-503, Final Initial and Recommended Determination at 4, Notice of Commission Nonreview (February 24, 2005) (Transmissions). Moreover the active respondents and the MMC respondents have responded to the original and/or amended complaints and notice

of investigation, and have participated in this investigation, thereby submitting to the Commission's jurisdiction. Hence, the Commission has in personam jurisdiction over said respondents. See Transmissions at 4.[5] The Commission also has personal jurisdiction over defaulting respondents Glory South, AcuJet and Mipo America because each of said respondents is a domestic entity and has been served by the Commission with the original and amended complaints and notice of investigation. See Certain Reclosable Plastic Bags and Tubing, Inv. No. 337-TA-266 (Jan. 29, 1988) ("With respect to in personam jurisdiction upon a showing of service of process, there is jurisdiction over domestic respondents.")

IV. Live Witnesses And Person Of Ordinary Skill

See FF 109-117.

V. Claim Interpretation

Claim interpretation is a question of law. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996); see Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1455 (Fed. Cir. 1998). In construing claims, a court should look to intrinsic evidence consisting of the language of the claims, the specification and the prosecution history as it "is the most significant source of the legally operative meaning of disputed claim language." Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996); see Bell Atl. Network Servs., Inc. v. Covad Comm. Group, Inc., 262 F.3d 1258, 1267 (Fed. Cir. 2001).

The claims themselves "provide substantial guidance as to the meaning of particular claim terms." Phillips v. AWH Corp., 415 F.3d 1303, 1314 (Fed. Cir. 2005), citing Vitronics, 90

---

[5] The administrative law judge, in Order No. 20 which issued on October 12, 2006, struck the affirmative defense of lack of personal jurisdiction as to respondent Ninestar Technology Co. Ltd.

F.3d at 1582. It is essential to consider the claim as a whole when construing each term, because the context in which a term is used in a claim "can be highly instructive." Id. This requirement is consistent with the Federal Circuit's guidance that a claim term can only be understood "with a full understanding of what the inventors actually invented and intended to envelop with the claim." Phillips, 415 F.3d at 1316, citing Renishaw PLC v. Marposs Societá per Azioni,158 F.3d 1243, 1250 (Fed. Cir. 1998). Claim terms "are generally given their ordinary and accustomed meaning." Vitronics, 90 F.3d at 1582.

In Pause Technology, Inc. v. TIVD, Inc., 419 F.3d 1326 (Fed. Cir. 2005) the Court stated:

> . . . in clarifying the meaning of claim terms, courts are free to use words that do not appear in the claim so long as "the resulting claim interpretation . . . accord[s] with the words chosen by the patentee to stake out the boundary of the claimed property." Cf. Renishaw PLC v. Marposs Societá per Azioni, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (noting that "[w]ithout any claim term susceptible to clarification . . . there is no legitimate way to narrow the property right").

Id. 419 F.3d at 1333. Also, claim terms are presumed to be used consistently throughout the patent, such that the usage of the term in one claim can often illuminate the meaning of the same term in other claims. Research Plastics, Inc. v. Federal Packaging Corp. 421 F.3d 1290, 1295 (Fed. Cir. 2005).

The ordinary meaning of a claim term may be determined by reviewing a variety of sources, which may include the claims themselves, dictionaries and treatises, and the written description, the drawings and the prosecution history. Ferguson Beauregard/Logic Controls v. Mega Sys., LLC, 350 F.3d 1327, 1338 (Fed. Cir. 2003). The use of a dictionary however may extend patent protection beyond what should properly be afforded by a patent. Also, there is no

guarantee that a term is used in the same way in a treatise as it would be by a patentee. Phillips 415 F.3d at 1322. Moreover, the presumption of ordinary meaning will be "rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." ACTV, Inc. v. Walt Disney Co., 346 F.3d 1082, 1091 (Fed. Cir. 2003). In Terlap v. Brinkmann Corp. 418F.3d 1379, 1384 (Fed. Cir. 2005), the Court concluded that the district court "attached appropriate weight" to the dictionary definitions in the context of the intrinsic evidence in reaching its construction of a claim term "clear."

The presence of a specific limitation in a dependent claim raises a presumption that the limitation is not present in the independent claim. Phillips, 415 F.3d at 1315. This presumption is especially strong when the only difference between the independent and dependant claims is the limitation in dispute. SunRace Roots Enter. Co., Ltd v. SRAM Corp., 336 F.3d 1298, 1303 (Fed. Cir. 2003) (Sun Race). Differences between the claims are helpful in understanding the meaning of claim terms. Phillips, 415 F.3d at 1314. "[W]here the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest." Liebel – Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed. Cir. 2004). An independent claim usually covers a scope "broader than the preferred embodiment, especially if the dependent claims recite the precise scope of the preferred embodiment." RF Delaware v. Pacific Keystone Tech., 326 F.3d 1255, 1264 (Fed. Cir. 2003).

The specification of a patent "acts as a dictionary" both "when it expressly defines terms used in the claims" and "when it defines terms by implication." Vitronics, 90 F.3d at 1582. For example, the specification "may define claim terms by implication such that the meaning may be

found in or ascertained by a reading of the patent documents." Phillips, 415 F.3d at 1323, quoting Iredto Access, Inc. v. Echostar Satellite Corp., 383 F.3d 1295, 1300 (Fed. Cir. 2004). Importantly, "the person of ordinary skill in the art is deemed to read the claim term not only in context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." Phillips, 415 F.3d at 1314. The Federal Circuit has explained that "although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments." Phillips, 415 F.3d at 1323.

A patentee may deviate from the conventional meaning of a particular claim term by making the intended meaning of a particular claim term clear (1) in the specification or (2) during the patent's prosecution history. Lear Siegler, Inc. v. Aeroquip Corp., 733 F.2d 881, 889 (Fed. Cir. 1984) (Lear Siegler). If using a definition that is contrary to the definition given by those of ordinary skill in the art, however, the patentee's specification must communicate a deliberate and clear preference for the alternate definition. Kumar v. Ovonic Battery Co., Inc., 351 F.3d 1364, 1368 (Fed. Cir. 2003) (Kumar), (citing Apple Computers, Inc. v. Articulate Sys., Inc., 234 F.3d 14,21 n.5 (Fed. Cir. 2000)). In ascribing an alternative definition than the ordinary meaning, the intrinsic evidence must "clearly set forth" or "clearly redefine" a claim term so as to put one reasonably skilled in the art on notice that the patentee intended to so redefine the claim term. Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1268 (Fed. Cir. 2001) (Bell Atlantic).

The prosecution history, including "the prior art cited," is "part of the 'intrinsic evidence.'" Phillips, 415 F3d at 1317. The prosecution history "provides evidence of how the

inventor and the PTO understood the patent." Id. Thus, the prosecution history can often inform the meaning of the claim language by demonstrating how an inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. Vitronics, 90 F.3d at 1582-83; see also Chimi v. PPG Indus., Inc., 402 F.3d 1371, 1384 (Fed. Cir. 2005) ("The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution"), quoting ZMI Corp. v. Cardiac Resuscitator Corp., 844 F.2d 1576, 1580 (Fed. Cir. 1988); Southwall Techs., Inc. v. Cardinal IG Co., F.3d 1570, 1576 (Fed. Cir. 1995). The prosecution history includes any reexamination of the patent. Intermatic Inc. v. Lamson & Sessions Co., 273 F.3d 1355, 1367 (Fed. Cir. 2001).

In addition to the intrinsic evidence, the administrative law judge may consider extrinsic evidence when interpreting the claims. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, including inventor testimony and expert testimony. This extrinsic evidence may be helpful in explaining scientific principles, the meaning of technical terms, and terms of art. See Vitronics Corp., 90 F.3d at 1583; Markman, 52 F.3d at 980. However, "[e]xtrinsic evidence is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims." Markman, 52 F.3d at 981. Also, the Federal Circuit has viewed extrinsic evidence in general as less reliable than the patent and its prosecution history in determining how to read claim terms. Phillips, 415 F.3d at 1318. In addition, while extrinsic evidence may be useful, it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence. Phillips, 415 F.3d at 1319.

In Nystrom v. Trex Company 424 F.3d 1136 (Fed. Cir. 2005), (Nystrom) the Court stated:

> . . . as explained in Phillips, Nystrom is not entitled to a claim construction divorced from the context of the written description and prosecution history. The written description and prosecution history consistently use the term "board" to refer to wood decking materials cut from a log. Nystrom argues repeatedly that there is no disavowal of scope of the written description or prosecution history. Nystrom's argument is misplaced. Phillips, 415 F.3d at 1321 ("The problem is that if the district court starts with the broad dictionary definition in every case and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive."). What Phillips now counsels is that in the absence of something in the written description and/or prosecution history to provide explicit or implicit notice to the public– i.e., those of ordinary skill in the art– that the inventor intended a disputed term to cover more than the ordinary and customary meaning revealed by the context of the intrinsic record, it is improper to read the term to encompass a broader definition simply because it may be found in a dictionary, treatise, or other extrinsic source. Id.

Id. 424 F.3d at 1144, 1145. In Free Motion Fitness Inc. v. Cybex International, Inc. 423 F.3d 1343 (Fed. Cir. 2005) (Free Motion), the Court concluded that:

> under Phillips, the rule that 'a court will give a claim term the full range of its ordinary meaning', Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342 (Fed.Cir. 2001), does not mean that the term will presumptively receive its broadest dictionary definition or the aggregate of multiple dictionary definitions. Phillips, 415 F.3d at 1320- 1322. Rather, in those circumstances, where references to dictionaries is appropriate, the task is to scrutinize the intrinsic evidence in order to determine the most appropriate definition.

423 F.3d at 1348,49. In Network Commerce, Inc. v. Microsoft Corp. 422 F.3d 1353 (Fed. Cir. 2005), the Court concluded:

> As we recently reaffirmed in Phillips, "conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court." Phillips, 415 F.3d at 1318. Here [expert] Coombs does not support his conclusion [the "download

> component" need not contain the boot program] with any references to industry publications or other independent sources. Moreover, expert testimony at odds with the intrinsic evidence must be disregarded. Id. ("[A] court should discount any expert testimony that is clearly at odds with the claim construction mandated by . . . the written record of the patent." (internal quotations and citation omitted). That is the case here.

Id., at 1361.

Patent claims should be construed so as to maintain their validity. However, that maxim is limited to cases in which a court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous. Phillips, 415 F.3d at 1327. If the only reasonable interpretation renders the claim invalid, then the claim should be found invalid. See, e.g., Rhine v. Casio, Inc., 183 F.3d 1342, 1345 (Fed. Cir. 1999) (Rhine).

A. Suzuki Sponge Family

It is undisputed that the five patents in issue, viz. United States Patent No. 5,615,957 (the '957 patent), United States Patent No. 5,622,439 (the '439 patent), United States Patent No. 5,158,377 (the '377 patent), United States Patent No. 5,221,148 (the '148 patent), and United States Patent No. 5,156,472 (the '472 patent) are referred to as the Suzuki sponge family and all share an identical or a nearly identical specification. (CFF IV.A.1, (undisputed).)[6] (See CX-1, CX-2, CX-3, CX-4, CX-5; CBr at 20; RBr at 9-10, n.4; SBr at 9.) The sponge family of patents is generally directed to the use of a sponge-like, ink-absorbing member within an ink tank for a dot matrix printer. (See CX-1 at Abstract, CX-2 at Abstract, CX-3 at Abstract, CX-4 at Abstract,

[6] Takashi Suzuki is a named inventor on each of said patents.

CX-5 at Abstract.) Thus the abstract of the '472 patent[7] reads:

> An ink-supply system for a dot matrix printer including an ink-supply tank having an ink-supply delivery port, an ink impregnated member formed of a porous material within the ink-supply tank, and ink impregnated in the ink absorbing member under a pressure sufficiently low to substantially eliminate air bubbles within the ink impregnated member.

(CX-5.) The abstract of the '377 patent reads:

> An ink-supply system for a dot matrix printer including an ink-supply tank formed with an ink supply delivery port having an opening for passage of ink from the ink-supply tank. An ink absorbing member formed of a porous material is mounted within the ink-supply tank and compressed relative to at least another region of the ink absorbing member at least in the region thereof facing the opening of the ink supply delivery port.

(CX-3.) The abstract of the '148 patent reads:

> An ink-supply system for a dot matrix printer including an ink-supply tank formed with an ink-supply delivery port and an ink absorbing member formed of a porous material and dimensioned to substantially fill the ink-supply tank. The ink-supply tank includes an inner wall surface having projections to provide a space between the ink absorbing member and the wall surface.

(CX-4.) The abstract of the '957 and '439 patents read:

> An ink-supplied wire dot matrix printer head for actuating wires with ink attached to tip ends thereof into contact with a sheet of print paper to transfer ink to the sheet, thereby forming ink dots thereon. The ink-supplied wire dot matrix printer head includes a wire guide member having a wire guide hole for guiding the tip end of the wire, and an ink tank containing an ink absorbing body therein and having an ink supply port in which a portion of the wire guide member is inserted. The wire guide member has a capillary ink path communicating with a side of the wire and

---

[7] The abstract of a patent can be looked to for determining the scope of a claimed invention. Hill-Rom Company, Inc. v. Kinetic Concepts Inc. 208 F.3d 1337, 1341, n. 1, 54 U.S.P.Q.2d 1437, 1440 n. 1 (Fed. Cir. 2000).

supplied with ink from the ink absorbing body.

(CX-1; CX-2.)

1. Asserted Claims Of The Suzuki Sponge Family (The '957, '439, '377, '148 And '472 Patents)

The '957 patent is entitled "Ink Supply Tank For a Dot Matrix Printer." (CX-1.) The '957 patent issued on April 1, 1997, based on an application (Application Serial No. 465,163) filed on June 5, 1995, which is a continuation of Ser. No. 150,676 filed on November 10, 1993, now United States Patent No. 5,421,658, which is a continuation of Ser. No. 962,959 filed on October 16, 1992, now United States Patent No. 5,328,279, which is a continuation of Ser. No. 612,010 filed on November 9, 1990, now United States Patent No. 5,156,471, which is a continuation of Ser. No. 401,539 filed on August 31, 1989, now United States Patent No. 4,969,759, which is a continuation of Ser. No. 161,216 filed on February 17, 1988, now abandoned, which is a continuation of Ser. No. 35,251 filed on March 23, 1987, now abandoned, which is a continuation of Ser. No. 873,871 filed on June 12, 1986, now abandoned, which is a continuation of Ser. No. 659,816 filed on October 11, 1984, now abandoned, which claimed priority from Japan Application Nos. 59-102841, 59-102842 and 59-102843, all filed on May 22, 1984. (CX-1.)

The '957 patent has 23 claims. (CX-1). Only claim 7 is asserted. Claim 7 of the '957 patent is an independent claim. (CX-1). Asserted claim 7 of the '957 patent is as follows:

7. An ink supply tank for a dot matrix printer, comprising:

a tank housing having an interior space defined in part by first and second spaced opposed walls;

an ink supply delivery port extending through a first wall of said tank housing said

port having an opening to said interior space to permit the passage of ink from said interior space to the exterior of said tank housing; and

an ink absorbing member substantially filling said interior space of said tank housing and being formed of a porous material, said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port;

said second wall of said tank housing being spaced at least in part sufficiently apart from said ink absorbing member to provide an air communication space therebetween, said tank housing being formed with an air communication hole therethrough, said air communication space being in fluid communication with ambient air through said air communication hole.

The '439 patent is entitled "Ink-Supply Tank for a Dot Matrix Printer." (CX-2.) The '439 patent issued on April 22, 1997, based on an application (Application Serial No. 465,630) filed on June 5, 1995, which is a continuation of Ser. No. 405,280 filed on March 14, 1995, now United States Patent No. 5,560,720, which is a continuation of Ser. No. 150,676 filed on November 10, 1993, now United States Patent No. 5,421,658, which is a continuation of Ser. No. 962,959 filed on October 16, 1992, now United States Patent No. 5,328,279, which is a continuation of Ser. No. 612,010 filed on November 9, 1990, now United States Patent No. 5,156,471, which is a continuation of Ser. No. 401,539 filed on August 31, 1989, now United States Patent No. 4,969,759, which is a continuation of Ser. No. 161,216 filed on February 17, 1988, now abandoned, which is a continuation of Ser. No. 35,251 filed on March 23, 1987, now abandoned, which is a continuation of Ser. No. 873,871 filed on June 12, 1986, now abandoned, which is a continuation of Ser. No. 659,816 filed on October 11, 1984, now abandoned, which claimed priority from Japan Application Nos. 59-102841, 59-102842 and 59-102843, all filed on May 22, 1984, Japan Application No. 58-224892, filed on November 29, 1983, and Japan Application No. 58-191529, filed on October 13, 1983. (CX-2.)

The '439 patent has 212 claims. (CX-2.) Only claims 18, 81, 93, 149, 164, and 165 are asserted. Claims 18, 81, and 149 of the '439 patent are independent claims, while claim 93 is dependent on non-asserted claim 82 (which depends on claim 81), claim 164 is dependent on non-asserted claim 163 (which depends on non-asserted claim 161 (which depends on claim 149)), and claim 165 is dependent on non-asserted claim 161 (which depends on claim 149). (CX-2.)

Asserted claims 18, 81, 93, 149, 164 and 165 of the '439 patent are as follows:

18. An ink-supply tank for a dot matrix printer comprising:

an ink-supply tank having a first wall and a second wall extending substantially in a perpendicular direction to said first wall, said first wall having a length as viewed in a direction therealong extending from said second wall;

an ink absorbing member mounted within the ink-supply tank; and

an ink receiving and transmitting member comprising an elongated member, said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall, said elongated member being formed with an opening at the distal end thereof and with a passage extending longitudinally therealong from said opening along the length of said elongated member to permit ink to flow away from said opening, at least a portion of said elongated member defining at least said opening and a portion of said passage being defined by a non-porous material, said elongated member engaging a portion of said ink absorbing member at least in the region of said ink absorbing member facing said opening.

81. An ink-supply tank for a dot matrix printer comprising:

an ink-supply tank having a first wall and a second wall extending substantially in a perpendicular direction to said first wall, said first wall having a length as viewed in a direction therealong extending from said second wall;

an ink absorbing member mounted within said ink-supply tank; and

said ink-supply tank being formed with an ink supply port positioned to receive ink from said ink absorbing member and constructed to transmit ink from said

ink-supply tank through said first wall for delivery to a dot matrix printer, said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member.

93. The ink-supply tank of claim 82,

wherein said ink-supply tank includes a further wall facing the end of said elongated member, said ink absorbing member being compressingly contained in the space intermediate said further wall and said elongated member.

149. An ink-supply system for a dot matrix printer comprising:

an ink-supply tank having a first wall having a first side facing the interior of said tank and a second side facing the exterior of said tank;

an ink absorbing member mounted within the ink-supply tank; and

an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member, said elongated member extending into said ink-supply tank from said first side of said first wall, said elongated member being formed with an opening at at [sic] least a distal end thereof and with a passage extending longitudinally therealong from said opening along the length of said elongated member engaging a portion of said ink absorbing member at least in the region of said ink absorbing member facing said opening, at least a region of said elongated member and of said passage extending therealong adjacent said ink absorbing member being essentially free of porous material.

164. The ink-supply system of claim 163,

wherein said further wall of said ink-supply tank facing said elongated member is a cover bearing on said ink absorbing member when assembled to said ink-supply tank to at least in party [sic] apply a compressive force to effect compression of said ink absorbing member, at least a portion of said projections extending from the inner wall surface of said cover.

165. The ink-supply system of claim 161,

and including ink impregnated in the ink absorbing member under a pressure sufficiently low to substantially eliminate air bubbles in the ink absorbing

member.

The '377 patent is entitled "Ink-Supply System For A Dot Matrix Printer." (CX-3.) The '377 patent issued on October 27, 1992, based on an application (Application Serial No. 620,411) filed on November 30, 1990, which is a division of Ser. No. 612,010 filed on November 9, 1990, now United States Patent No. 5,156,471, which is a continuation of Ser. No. 401,539 filed on August 31, 1989, now United States Patent No. 4,969,759, which is a continuation of Ser. No. 161,216 filed on February 17, 1988, now abandoned, which is a continuation of Ser. No. 35,251 filed on March 23, 1987, now abandoned, which is a continuation of Ser. No. 873,871 filed on June 12, 1986, now abandoned, which is a continuation of Ser. No. 659,816 filed on October 11, 1984, now abandoned, which claimed priority from Japan Application Nos. 59-102841, 59-102842 and 59-102843, all filed on May 22, 1984. (CX-3.) The '377 patent is subject to a terminal disclaimer and will expire on November 13, 2007. (CX-3.)

The '377 patent has 114 claims. (CX-3.) Only claims 83 and 84 are asserted. Claim 83 of the '377 patent is an independent claim, while claim 84 is dependent on claim 83. (CX-3.) Asserted claims 83 and 84 of the '377 patent are as follows:

83. An ink-supply system for a dot matrix printer, comprising:

> an ink-supply tank formed with an ink-supply delivery port having an opening for the passage of ink from said ink-supply tank;
>
> an ink absorbing member formed of a porous material mounted within said tank, said ink absorbing member having a region facing said opening and being compressingly contained by the ink-supply tank against the ink-supply delivery port so that at least the region of the ink absorbing member facing said opening is compressed relative to at least another region of the ink absorbing member; and

said ink absorbing member substantially filling said ink-supply tank, said ink-supply tank including an inner wall surface having projections to provide a space between said ink absorbing member and said wall surface.

84. The ink-supply system of claim 83,

and including means for providing ambient air to the space between said ink absorbing member and said wall surface.

The '148 patent is entitled "Dot Matrix Printer Ink Supply System Having Ink Absorbing Member Substantially Filling An Ink Tank." (CX-4.) The '148 patent issued on June 22, 1993, based on an application (Application Serial No. 620,408) filed on November 30, 1990, which is a division of Application Ser. No. 612,010 filed on November 9, 1990, now United States Patent No. 5,156,471, which is a continuation of Application Ser. No. 401,539 filed on August 31, 1989, now United States Patent No. 4,969,759, which is a continuation of Application Ser. No. 161,216 filed on February 17, 1988, now abandoned, which is a continuation of Application Ser. No. 035,251 filed on March 23, 1987, now abandoned, which is a continuation of Application Ser. No. 873,871 filed on June 12, 1986, now abandoned, which is a continuation of Application Ser. No. 659,816 filed on October 11, 1984, now abandoned, which claimed priority from Japan Application Nos. 59-102841, 59-102842 and 59-102843, all filed on May 22, 1984. (CX-4.) The '148 patent is subject to a terminal disclaimer and will expire on November 13, 2007. (CX-4.)

The '148 patent has 28 claims. (CX-4.) Only claims 19 and 20 are asserted. Claim 19 of the '148 patent is an independent claim, while claim 20 is dependent on claim 19. (CX-4.) Asserted claims 19 and 20 of the '148 patent are as follows:

19. An ink-supply system for a dot matrix printer comprising:

an ink-supply tank formed with an ink-supply delivery port; and

an ink absorbing member formed of a porous material and dimensioned to substantially fill the ink-supply tank, said ink absorbing member being filled with ink substantially to the desired capacity of the ink-supply tank, said ink-supply tank including an inner wall surface having projections to provide a space between said ink absorbing member and said wall surface.

20. The ink-supply system of claim 19,

and including means for providing ambient air to the space between said ink absorbing member and said wall surface.

The '472 patent is entitled "Dot Matrix Printer Supply System Having Ink Absorbing Member Filled Under Reduced Pressure." (CX-5.) The '472 patent is based on an application (Application Serial No. 620,483) filed on November 30, 1990, which is a division of Ser. No. 612,010 filed on November 9, 1990, now United States Patent No. 5,156,471, which is a continuation of Ser. No. 401,539 filed on August 31, 1989, now United States Patent No. 4,969,759, which is a continuation of Ser. No. 161,216 filed on February 17, 1988, now abandoned, which is a continuation of Ser. No. 35,251 filed on March 23, 1987, now abandoned, which is a continuation of Ser. No. 873,871 filed on June 12, 1986, now abandoned, which is a continuation of Ser. No. 659,816 filed on October 11, 1984, now abandoned, which claimed priority from Japan Application Nos. 59-102841, 59-102842 and 59-102843, all filed on May 22, 1984. (CX-5.) The '472 patent is subject to a terminal disclaimer and will expire on November 13, 2007. (CX-5.)

The '472 patent has 39 claims. (CX-5.) Only claims 29, 31, 34 and 38 are asserted. Claims 29 and 38 of the '472 patent are independent claims, while claim 31 is dependent on non-asserted claim 30 (which depends on claim 29) and claim 34 is dependent on non-asserted claim 33 (which depends on non-asserted claim 32 (which depends on claim 31). (CX-5.) Asserted

claims 29, 31, 34 and 38 of the '472 patent are as follows:

29. An ink-supply system for a dot matrix printer head, comprising:

an ink-supply tank having an ink-supply delivery port;

an ink absorbing member formed of a porous material within said ink-supply tank; and

ink impregnated in said ink absorbing member under a pressure sufficiently low to substantially eliminate air bubbles within the ink impregnated member, wherein air bubbles which would adversely affect operation of the printer are substantially eliminated.

31. The ink-supply system of claim 30,

wherein said ink absorbing member is compressed at least in the region of said ink-supply delivery port.

34. The ink-supply system of claim 33,

wherein a wall of said ink-supply tank facing said ink-supply delivery port is a cover means bearing on said ink absorbing member when assembled to said ink-supply tank to at least in part apply a compressive force to effect compression of said ink absorbing member, at least a portion of said projections extending from the inner wall surface of said cover means.

38. The method of applying ink to a dot matrix printer, comprising:

storing ink in a ink-supply tank having an ink-supply delivery port;

providing an ink absorbing member formed of a porous material in said ink-supply tank so that substantially the desired capacity of ink for said ink-supply tank is carried by the ink absorbing member; and

impregnating ink in said ink absorbing member under a pressure sufficiently low to substantially eliminate air bubbles within the ink impregnated member, whereby air bubbles which would adversely affect operation of the printer are substantially eliminated.

The parties have put in issue the following claimed phrases for interpretation: "dot matrix printer" and "dot matrix printer head" (all asserted claims of the sponge patents)[8], "ink supply port," "ink supply delivery port" and "said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall " (claim 7 of the '957 patent, claims 81 and 93 of the '439 patent, claims 83 and 84 of the '377 patent, claims 19 and 20 of the '148 patent, and claims 29, 31, 34 and 38 of the '472 patent), "ink receiving and transmitting member comprising an elongated member," "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" and "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall" (claims 18, 149, 164, and 165 of the '439 patent), "ink supply tank" (all asserted claims of the sponge patents), "an ink absorbing member substantially filling said interior space of said tank housing," "said ink absorbing member substantially filling said ink-supply tank," "an ink absorbing member formed of a porous material and dimensioned to substantially fill the ink-supply tank," "said ink absorbing member being filled with ink substantially to the desired capacity of the ink-supply tank," and "providing an ink absorbing member formed of a porous material in said ink-supply tank so that substantially the desired capacity of ink for said ink-supply tank is carried by the ink absorbing member" (claim 7 of the

---

[8] The claimed term "dot matrix printer head" appears in the preamble of asserted claim 29 of the '472 patent. The claimed term "dot matrix printer" appears in the preamble of all the other asserted claims of the sponge patents.

'957 patent, claim 38 of the '472 patent, claims 83 and 84 of the '377 patent, and claims 19 and 20 of the '148 patent), "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port" (claim 7 of the '957 patent) and "said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member" (claims 81 and 93 of the '439 patent).

Complainants and the staff offered interpretations for the following claimed phrase: "ink-supply system" (claims 149, 164 and 165 of the '439 patent, claims 83 and 84 of the '377 patent, claims 19 and 20 of the '148 patent, and claims 29, 31 and 34 of the '472 patent). However, the active respondents failed to offer an interpretation of said claimed phrase, in any of their post-hearing submissions.

Complainants also offered interpretations for the following claimed phrases: "cover means bearing on said ink absorbing member when assembled to said ink-supply tank to at least in part apply a compressive force to effect compression of said ink absorbing member" (claims 31 and 34 of the '472 patent), and "means for providing ambient air to the space between said ink absorbing member and said wall surface" (claim 84 of the '377 patent and claim 20 of the '148 patent). However, both the active respondents and the staff failed to offer interpretations of said claimed phrases, in any of their post-hearing submissions.

a. "dot matrix printer" and "dot matrix printer head"

Complainants argued that the claimed phrases "dot matrix printer" and "dot matrix printer head" in all the asserted claims of the sponge patents should be interpreted as "any type of printer which causes a matrix of ink dots to be placed on an ink-receiving surface to form a character, figure, graphic image, or the like, including ink-jet type dot matrix printers." (CBr at

36.) It is argued that the terms "dot matrix printer" and "dot matrix printer head" should be given their ordinary meaning as applying to all dot matrix printers and that said ordinary meaning is fully supported by and consistent with the intrinsic record, including the patent specifications, prosecution histories, and cited prior art. (CBr at 36.) It is further argued that the common specification of the "sponge patents" does not limit or provide a special definition of "dot matrix printer" that would alter the plain meaning of its usage in the claims; and, to the contrary, the consistent usage of "wire dot matrix printer" throughout the specifications to reference the wire dot matrix printer disclosed as the preferred embodiment in the patent, in contrast to the usage of "dot matrix printer" and "dot matrix printer head" in the claims, is indicative of the intent by the patentees that "dot matrix printer" and "dot matrix printer head" be more broadly applied. (CBr at 36.)

Complainants further argued that said intent is even more clearly expressed in the prosecution histories of the applications of the sponge patents. (CBr at 36.) In particular, it is argued that the "parent" applications to the sponge patents included claims having preambles specifically directed to "an ink-supplied wire dot matrix printer head" and were also all entitled "Ink-Supplied Wire Dot Matrix Printer Head." Complainants argued that in the initial filing of the '377 patent, claims were submitted with preambles that only referred to either a "dot matrix printer" or "dot matrix printer head" but later changed the application title from "Ink-Supplied Wire Dot Matrix Printer Head" to "Dot Matrix Printer Head." It is argued that in the initial filings of the other sponge patents, claims were included that referred to either "dot matrix printer" or "dot matrix printer head" and that later the application titles were changed accordingly. (CBr at 36-37.)

Complainants, in addition, argued that the plain and ordinary meaning of "dot matrix printer" and "dot matrix printer head" as applying to all such dot matrix printers is even reflected in the cited prior art references that were intrinsic to the prosecution. (CBr at 37.) For example, it is argued that two references at issue during the prosecution of the sponge patents disclose that the term "dot matrix printer" was understood by one of ordinary skill in the art to include both impact and non-impact dot matrix printers, such as ink jet printers. (CBr at 37.) It is further argued that the prosecution history of the '957 patent reveals that both the patentees and the Examiner understood that the terms "dot matrix printer" and "dot matrix printer head" include ink jet printers. (CBr at 38.)

Complainants also argued that that proposed construction is also supported by extrinsic evidence as well as intrinsic evidence because "dozens of patents" in the field of printers which were filed around or prior to the effective filing date of the sponge patents clearly acknowledge that the term "dot matrix printer" is understood by persons of skill in the art to encompass all such printers, including ink jet printers, and is not limited simply to "wire dot matrix printers." (CBr at 38.) It is further argued that two federal district courts have interpreted the terms "dot matrix printer" and "dot matrix printer head" in accordance with its plain meaning, which is consistent with complainants' proposed construction, and rejected the argument that respondents advanced. (CBr at 38.)

The active respondents argued that the claimed phrase "dot matrix printer" should be interpreted as "an impact type printer, which creates characters on paper, for example, by

transferring or moving ink from an ink supply tank along or within a wire."[9] It is argued that while the parties dispute the meaning of "dot matrix printer," there is "no dispute" that the sponge patents disclose only embodiments directed to a wire dot matrix printer. (RBr at 65.) It is further argued that, for example, the specification of the '957 patent "leaves no doubt" that the alleged claims in issue are directed to a wire dot matrix printer and an ink supply system for a wire dot matrix printer. (RBr at 66.) It is also argued that conspicuously absent from all the sponge patents is any mention of an ink jet printing apparatus, an ink-jet cartridge or an ink supply needle; that there is no claim of any of the sponge patents that expressly recites an ink jet printer or a cartridge for an ink jet printer; and that any such express claim would have been rejected by the Examiner prosecuting the sponge patents as raising new matter, because there is no support in the specification as filed for an ink-jet printer or a cartridge for an ink-jet printer. (RBr at 67.)

The staff argued that the terms "dot matrix printer" and "dot matrix printer head" are found only in the preamble of the independent claims asserted from the sponge patents, and said terms do not constitute a claim limitation here. (SBr at 22.) It is further argued that even assuming the terms "dot matrix printer" and "dot matrix printer head" constitute a claim limitation, respondents' construction, which unnecessarily imports limitations from the specification, would still not be correct[10]. (SBr at 23.) It is argued that the common specification

---

[9] The active respondents do not specifically address the claimed phrase "dot matrix printer head" that appears in the preamble of asserted claim 29 of the '472 patent because complainants do not assert any of the claims of the '472 patent against the active respondents.

[10] The staff does not state whether it adopts complainants' interpretation of the claimed phrases "dot matrix printer" and "dot matrix printer head", nor does the staff offer its own interpretation of said claimed phrases. (See SBr at 22-26.)

explicitly equates inkjet printers with dot printers. (SBr at 24.) The staff also argued that during prosecution of the '957 patent, the applicant confirmed to the Examiner that "a 'dot matrix printer' covers ink jet printers" and further confirmed that a prior art reference "directed to an inkjet printer was properly considered as prior art." (SBr at 24-25.) It is further argued that other non-asserted patents from the same parental lineage as the sponge patents, such as U.S. Patent Nos. 5,156,471, and 5,969,759 use the term "wire dot matrix printer" in the preamble, which confirms that the active respondents' restricted construction should not be adopted. (SBr at 25.)

In issue is whether the claimed phrases "dot matrix printer" and dot matrix printer head" only encompass a specific type of dot matrix printer (i.e. a wire dot matrix printer, which is one type of an impact-type printer) or whether said claimed phrases encompass all types of dot matrix printers (i.e. both impact-type printers and nonimpact-type printers).[11]

With respect to the claim language, the administrative law judge finds that the claim language in the preamble of all the asserted claims use the phrases "dot matrix printer" or "dot matrix printer head" as opposed to "wire dot matrix printer" or "wire dot matrix printer head." (See CX-1 at 10:24; CX-2 at 10:35, 15:35, 20:35; CX-3 at 19:23; CX-4 at 11:54; CX-5 at 12:38-39, 13:20-21.)

The administrative law judge finds that the "Abstract" section of each of the specifications of the '377 patent, the '148 patent, and the '472 patent discloses that the invention is "an ink-supply system for a dot matrix printer..." (CX-3 at Abstract, CX-4 at Abstract, CX-5 at

---

[11] The administrative law judge treats the claimed phrases "dot matrix printer" and "dot matrix printer head" as the same. Thus, the analysis of the claimed phrase "dot matrix printer" also applies to the claimed phrase "dot matrix printer head." Moreover neither complainants, the active respondents nor the staff argued that said terms and any other language in dispute should have a different interpretation, depending on the specific sponge patent in issue.

Abstract.)[12] Thus, the administrative law judge finds that this is support for the broad interpretation of "dot matrix printer" and "dot matrix printer head" that includes both impact-type printers (including wire dot matrix printers) and nonimpact-type printers.

With respect to the specification of each of the sponge patents, the administrative law judge finds that said specification supports a broad interpretation of "dot matrix printer" and "dot matrix printer head" that includes both impact-type printers (including wire dot matrix printers) and nonimpact-type printers. The administrative law judge finds that the title of the specification of each of the sponge patents uses the phrase "dot matrix printer" as opposed to "wire dot matrix printer." (CX-1; CX-2; CX-3; CX-4; CX-5.)

With respect to describing ink supply systems, the administrative law judge also finds that the specification of each of the sponge patents in issue cites two pieces of prior art in the "Background of the Invention" section: U.S. Pat. No. 4,194,846 ("the '846 patent") and U.S. Pat. No. 4,456,393 ("the '393 patent"). (CX-1 at 1:34-38, 1:50-52; CX-2 at 1:38-42; 1:54-56; CX-3 at 1:34-38, 1:49-51; CX-4 at 1:35-39, 1:50-52; CX-5 at 1:35-39, 1:50-52.) The administrative law judge further finds that said specification also incorporates the '393 patent by reference. (CX-1 at 6:26-30; CX-2 at 6:36-40; CX-3 at 6:44-49; CX-4 at 6:44-49; CX-5 at 6:36-40.) The specification of the '846 patent discloses the following in the "Background of the Invention" section:

> Dot matrix printers presently in use employ ink as the printing means and are typically designed in accordance with one of the two following concepts:

---

[12] The "Abstract" section for the '957 patent and the '439 patent does not use the term "dot matrix printer."

> (1) Directly applying ink to the print receiving material to form the specified character. Such printers are typically referred to as "ink jet printers," as shown, for example, in U.S. Pat. No. 3,281,859.
>
> (2) Transferring ink contained within an ink carrying medium such as a fiber ribbon saturated with ink and positioned adjacent to the print receiving material whereby transfer occurs by impacting the inked ribbon against the ink receiving material. Printers of this type are generally referred to as "impact type printers." One typical printer of the dot matrix type is shown in U.S. Pat. No. 3,833,105, assigned to the assignee of the present application.

(CX-42 at 1:8-23 (emphasis added).) The specification of the '393 patent discloses the following with respect to dot printers and ink jet printers:

> A peristaltic pump in accordance with the invention is applicable to another dot printer[13] having a print head using a fluid ink, such as an ink jet printer and so on.

(CX-50 at 20:26-28 (emphasis added).) Thus, the administrative law judge finds that the specification of each of the sponge patents, by referencing the '846 and '393 patents, discloses the concept that "dot matrix printers" encompass both impact-type printers (i.e. wire dot matrix printers) and nonimpact-type printers (i.e. inkjet printers.)

With respect to the prosecution history of each of the sponge patents, the administrative law judge finds that said prosecution history of each of the sponge patents supports the broad interpretation of "dot matrix printer" and "dot matrix printer head" that includes both impact-

---

[13] The '393 patent also discloses that one of the forms of a dot printer is a dot matrix printer:

> A variety of methods of improving the print quality of a wire dot printer have have [sic] been proposed in the art. In accordance with one of the methods, the quality of prints made by the printer is made similar to that of prints made of a matrix printer.

(CX-50 at 26:66-27:2 (emphasis added).)

type printers (including wire dot matrix printers) and nonimpact-type printers.

Referring to the prosecution history of the '957 patent, in a Preliminary Amendment, the applicants, inter alia, added application claim 31, now asserted claim 7 of the '957 patent, which included the phrase "dot matrix printer" in the preamble of said claim, and amended the title of the specification from "Ink-Supplied Wire Dot Matrix Printer Head" to "Ink-Supply Tank For A Dot Matrix Printer." (CX-19, EPS 0143564, 0143568.) In the "Discussion" section of the Preliminary Amendment, the applicants stated:

> By this Preliminary Amendment, Applicants present claims specifically directed to an ink-supply tank for a dot matrix printer taught in the first parent application as filed.

(CX-19, EPS 0143572 (emphasis added).) Subsequently, in an Amendment, in response to an Office Action by the Examiner rejecting the applicants' claims, the applicants, inter alia amended application claim 31, now asserted claim 7 of the '957 patent. (CX-19, EPS 0143652.) In the "Remarks" section of the Amendment, the applicants stated:

> Applicants take this opportunity to confirm a conversation had during the interview. The Examiner inquired if applicants were taking the position that a "dot matrix printer" did not include ink jet printers, since the Examiner strongly believed that the recitation of a "dot matrix printer" covers ink jet printers. Applicant's counsel responded that they did not dispute that "dot matrix printer" covers ink jet printers, so that Mutoh, directed to an ink jet printer, was properly considered as prior art, albeit insufficient prior art to bar patentability.

(CX-19, EPS 0143656 (emphasis added).)

Referring to the prosecution history of the '439 patent, in a Preliminary Amendment, the applicants, inter alia, added application claims 42, 105, and 117, now asserted claims 18, 81, and 93 of the '439 patent, which included the phrase "dot matrix printer" in the preamble of

application claims 42 and 105, now asserted claims 18 and 81 of the '439 patent, and amended the title of the specification from "Ink-Supplied Wire Dot Matrix Printer Head" to "Ink Supply Tank For A Dot Matrix Printer." (CX-20, EPS 0143764, 0143769, 0143780, 0143782.) In the "Discussion" section of the Preliminary Amendment, the applicants stated:

> By this Preliminary Amendment, Applicants present claims specifically directed to an ink-supply tank for a dot matrix printer taught in the first parent application as filed.

(CX-20, EPS 0143788 (emphasis added).) Subsequently, as referenced infra, in a Amendment, the applicants, inter alia, added application claims 173, 188 and 189, now asserted claims 149, 164 and 165 of the '439 patent, which included the phrase "dot matrix printer" in the preamble of application claim 173, now asserted claim 149 of the '439 patent. (CX-20, EPS 0143916, 0143919, 0143920.)[14] In the "Remarks" section of the Amendment, the applicants stated:

> In addition, applicants also discussed at the interview adding additional claims 151 [sic] through 236, which are similar in scope and content to the allowed claims of co-pending application Serial No. 08/405,280.
>
> ***
>
> As such, applicants respectfully request that these new claims presented 155 through 236 are in condition for allowance, and notice to this effect is respectfully requested.

(CX-20, EPS 0143929 (emphasis added).)

Referring to the prosecution history of the '377 patent, in a Preliminary Amendment, the applicants, inter alia, added application claim 62, which included "dot matrix printer" in the

---

[14] The applicants subsequently filed a Amendment After Allowance Under Rule 1.312(a), further amending a portion of the claims of the patent application that became the '439 patent. However, none of these amendments amended the claims that ultimately became asserted claims 18, 81, 93, 149, 164 and 165 of the '439 patent. (See CX-20, EPS 0143948-0143950.)

preamble, added application claims 70 and 71, now asserted claims 83 and 84 of the '439 patent, which depended on application claim 62, and amended the title of the specification from "Ink-Supplied Wire Dot Matrix Printer Head" to "Dot Matrix Printer Head." (CX-21, EPS 0144306, 0144316.) Concurrently, in a Information Disclosure Statement, the applicant stated the following with respect to the patent application that ultimately became the '377 patent:

> The claims presented by the accompanying Preliminary Amendment are specifically directed to the ink-supply system taught in the application as filed, and to dot matrix printers formed therefrom, as well as the method of delivering ink to a dot matrix printer.
>
> ***
>
> Unlike the claims of the parent applications, the claims of this application are not limited to a wire dot matrix printer.

(CX-21, EPS 0144133 (emphasis added).) Subsequently, as referenced infra, in an Amendment Under Rule 1.116, in response to a Final Office Action by the Examiner rejecting the applicants' claims, the applicants, inter alia, amended application claim 70, now asserted claim 83 of the '377 patent, adding the phrase "dot matrix printer" in the preamble of application claim 70, now asserted claim 83 of the '377 patent, and making said claim an independent claim, amended the title of the specification from "Dot Matrix Printer Head" to "Ink Supply System For A Dot Matrix Printer," and canceling the original abstract, which referenced "wire dot matrix printer" and substituting an amended abstract that referenced "dot matrix printer." (CX-21, EPS 01444441, 0144443-0144444, 0144448.)[15] In the "Discussion" section of the Amendment Under

[15] The applicants subsequently filed a Supplemental Amendment After Appeal Under Rule 1.116, further amending a portion of the claims of the patent application that became the '377 patent. However, none of these amendments were to the claims that ultimately became asserted claims 83 and 84 of the '377 patent. (See CX-21, EPS 0144495-0144515.)

Rule 1.116, the applicants stated:

> This Amendment under Rule 116 is submitted in response to the Office Action mailed November 18, 1991, a Petition seeking the requisite extension of time being filed herewith.
>
> ***
>
> In the Office Action, the Examiner objected to the title as not being descriptive. A new title is proposed.
>
> ***
>
> The Examiner objected to the Abstract and a substitute Abstract is furnished herewith.
>
> ***
>
> The Examiner rejects claims 25-36, 38-47, 62-73, 75-86, 88-97, 112-123, 125-129 and 131 under U.S.C. § 102(b) as being anticipated by Shiurila (U.S. '519). By this Amendment, independent claims 25, 39, 48, 62, 70 [now asserted claim 83 of the '377 patent], 75, 89, 98, 112, 125 and 132, from which all of the claims remaining in the case depend, have been amended to clarify the intention thereof, although applicants disagree with the rejection of the Examiner for the reasons set forth at length below, and have only made the amendments in question in order to advance the prosecution of this application to prompt issuance.
>
> ***
>
> Finally in this connection, applicants have rewritten claim 70 [now asserted claim 83 of the '377 patent] into independent form to incorporate the limitations of claim 62 as that claim was amended and to rewrite the limitation about the ink absorbing member to recite that the member substantially fills said ink-supply tank. This is consistent with language suggested by the Examiner as precluding the interpretation attributed by the Examiner to Shiurila in connection with claims 28-34 and 38. It is respectfully submitted that new independent claim 70 [now asserted claim 83 of the '377 patent], as well as claim 71 [now asserted claim 84 of the '377 patent] which depends therefrom, is clearly allowable over the references of record.

(CX-21, EPS 0144449-0144451, 0144456 (emphasis added).)

Referring to the prosecution history of the '148 patent, in a Preliminary Amendment, the applicants, inter alia, added application claims 25 and 26, now asserted claims 19 and 20 of the '148 patent, which included the phrase "dot matrix printer" in the preamble of application claim 25, now asserted claim 19 of the '148 patent, and amended the title of the specification from "Ink-Supplied Wire Dot Matrix Printer Head" to "Dot Matrix Printer Head." (CX-22, EPS 0359879, 0359882.) Subsequently, as referenced infra, in an Amendment, in response to an Office Action by the Examiner rejecting the applicants' claims, the applicants, inter alia, amended application claim 25, now asserted claim 19 of the '148 patent, amended the title of the specification from "Dot Matrix Printer Head" to "Ink-Supply System For A Dot Matrix Printer," and cancelled the original abstract, which referenced "wire dot matrix printer" and substituted an amended abstract that referenced "dot matrix printer." (CX-22 at EPS 0359937-0359938.) In the "Discussion" section of the Amendment, the applicants stated:

> This Amendment is submitted in response to the Office Action mailed January 7, 1992, a Petition seeking the requisite extension of time being filed herewith.
>
> ***
>
> In the Office Action, the Examiner objected to the title as not being descriptive. A new title is proposed.
>
> ***
>
> The Examiner objected to the Abstract and a substitute Abstract is furnished herewith.
>
> ***
>
> The Examiner rejects claims 25-29, 37-41, 49 and 50 under 35

> U.S.C. § 103 as being unpatentable over Shiurila (U.S. '519). By this Amendment, independent claims 25 [now asserted claim 19 of the '148 patent], 31, 37, 43, 49, and 51, from which all of the claims remaining in the case depend, have been amended to clarify the intention thereof, although applicants disagree with the rejection of the Examiner for the reasons set forth at length below, and have only made the amendments in question in order to advance the prosecution of this application to prompt issuance.
>
> ***
>
> In particular, all of the independent claims [including now asserted claim 19 of the '148 patent] have been amended to recite that the ink absorbing member is dimensioned to substantially fill the ink-supply tank.

(CX-22, EPS 0359942-0359944 (emphasis added).) Subsequently, in an Examiner's Amendment that was part of a Notice of Allowability, inter alia, the title of the specification was amended from "Ink-Supply System For A Dot Matrix Printer" to "Dot Matrix Printer Ink Supply System Having Ink Absorbing Member Substantially Filling an Ink Tank." (CX-22, EPS 0359965.)

Referring to the prosecution history of the '472 patent, the applicants, inter alia, added application claims 25, 27, 30, 63, now asserted claims 29, 31, 34 and 38 of the '472 patent, which included the phrase "dot matrix printer" in the preamble of applications claims 44 and 35, now asserted claims 29 and 38, and amended the title of the specification from "Ink-Supplied Wire Dot Matrix Printer Head" to "Dot Matrix Printer Head." (CX-23, EPS 0145589, 0145592-0145594, 0145598.) Subsequently, as referenced infra, in an Amendment, in response to an Office Action by the Examiner rejecting the applicants' claims, the applicant, inter alia, amended application claims 25, 30, and 63, now asserted claims 29, 34 and 38 of the '472 patent, amended the title of the specification from "Dot Matrix Printer Head" to "Ink-Supply System For A Dot

Matrix Printer," and canceling the original abstract, which referenced "wire dot matrix printer" and substituting an amended abstract that referenced "dot matrix printer." (CX-23, EPS 0145639-0145640, 0145643, 0145645.) In the "Discussion" section of the Amendment, the applicants stated:

> This Amendment is submitted in response to the Office Action mailed January 13, 1992, a Petition seeking the requisite extension of time being filed herewith.
>
> ***
>
> In the Office Action, the Examiner objected to the title as not being descriptive. A new title is proposed.
>
> ***
>
> The Examiner objected to the Abstract and a substitute Abstract is furnished herewith.
>
> ***
>
> The Examiner rejects claims 25-32, 34, 51 and 53-64 under Section 103 as being unpatentable over Shiurila et al (U.S. '102) in view of Antonides et al (U.S. '470).
>
> ***
>
> All of the independent claims [including now asserted claims 23 and 38 of the '472 patent] have been amended to recite, as a whereby claus, [sic] as follows: "whereby air bubbles which would adversely affect operation of the printer are substantially eliminated."

(CX-23, EPS 0145646-0145648 (emphasis added).) Thereafter, in an Examiner's Amendment that was part of a Notice of Allowability, inter alia, the title of the specification was amended from "Ink-Supply System For A Dot Matrix Printer" to "Dot Matrix Printer Ink Supply System Having Ink Absorbing Member Filled Under Reduced Pressure." (CX-23, EPS 0145657.)

The administrative law judge further finds that, during the prosecution of each of the sponge patents, the Examiner considered prior art reference U.S. Pat. No. 4,279,519 ("the '519 patent"). (See CX-1, CX-2, CX-3, CX-4, CX-5.)[16] The '519 patent includes the following description of "dot matrix printer" in the "Background of the Invention" section:

> Dot matrix printers typically utilize liquid printing materials such as printing ink as the means for printing on a print receiving medium. The ink may either be applied to the print receiving medium by a technique in which the ink is propelled toward the print receiving medium, which technique is used in ink jet printers, or the ink may be transferred from a ribbon saturated with ink to the print receiving medium by impacting a printing element such as a print wire against the inked ribbon to transfer ink from the inked ribbon to the print receiving medium, forming printed data in the shape or contour of the surface portion of printing element striking the inked ribbon. The latter type of printers are typically referred to as impact type printers.

(CX-44 at 1:13-26 (emphasis added).)

Thus, the administrative law judge finds that all of the previously cited portions of the prosecution history of each of the sponge patents supports the broad interpretation of "dot matrix printer" and "dot matrix printer head" that includes both impact-type printers (including wire dot matrix printers) and nonimpact-type printers.

For the foregoing reasons, the administrative law judge interprets the claimed phrases "dot matrix printer" and "dot matrix printer head" as:

> any type of printer which causes a matrix of ink dots to be placed on an ink-receiving surface to form a character, figure, graphic image, or the like, including ink-jet type dot matrix printers.

The administrative law judge further finds that his finding is consistent with

---

[16] The '519 patent appears on the "Referenced Cited" section of each of the sponge patents.

complainants' expert Murch's testimony of the ordinary meaning of "dot matrix printer" to one skilled in the art:

> BY MR. ANDERSON:
>
> Q: Is there a category of type of printers that inkjet printers fall into?
>
> A: The general category is dot matrix printers.
>
> Q: And why is that?
>
> A: ... Dot matrix printers, in general, I think I mentioned before, could be divided into the two overall categories of impact and nonimpact.
>
> Q : Okay. And why don't we put up CDX-4, slide 11, please. And what's shown here on this demonstrative exhibit?
>
> A: This slide sort of shows, at a very general level, the notion of dot matrix printing technologies as the header divided into impact and nonimpact.
>
> As I mentioned before, the impact printer carries the ink directly either by depositing a drop of ink on the paper, by impacting the paper, or wire impacting a ribbon that contains ink. And the typical design is called a wire dot matrix printer.
>
> The nonimpact class of dot matrix printers, there are several different kinds. But we're focusing here on inkjet, which, as I said, ejects small droplets of ink on the paper.

(Murch, Tr. at 349:1-350:16 (emphasis added).)

The active respondents argued that the sponge patents disclose only embodiments directed to a wire dot matrix printer. (RBr at 65.) It is argued that the specification of the '957 patent, for example, "leaves no doubt that [Complainants'] alleged inventions are directed to a wire dot matrix printer and an ink supply system ... for a wire dot matrix printer," (RBr at 66),

citing the following language of the specification of the '957 patent:

> The present invention relates to an ink-supplied wire dot matrix printer head having wires supplied with ink at their distal end faces and movable against a sheet of print paper for transferring ink to the sheet in the form of dots to record a character, a figure, a graphic image or the like on the sheet, and more particularly to the construction of an ink tank and an ink guide for guiding ink from the ink tank to the distal end faces of the wires.
>
> ***
>
> Generally speaking, in accordance with the present invention, there is provided an ink-supplied wire dot matrix printer head having actuating wires. Ink is supplied to the distal ends of the wires which are displaced into contact with a sheet of print paper to transfer the ink to the sheet and thereby form ink dots thereon. The ink-supplied wire dot matrix printer head includes a wire guide member having a wire guide hole for guiding the distal end of the wire an ink tank containing an ink absorbing body therein and, an ink supply port in which a portion of the wire guide member is inserted. The wire guide member has a capillary ink path communicating with a side of the wire and supplied with ink from the ink absorbing body.

(CX-1 at 1:22-29, 1:66-2:10.) The active respondents also argued that the specification of the '377 patent described the object of the invention of the sponge patents (RBr at 67), citing the following language of the specification of the '377 patent:

> It is an object of the present invention to provide a high-quality and highly reliable ink-supplied wire dot matrix printer head of a simple construction which is capable of supplying a stable and appropriate quantity of ink from an ink tank to the distal ends of wires and is less subject to the influence of environmental changes such as temperature variations.

(CX-3 at 2:12-18.)

However, the administrative law judge finds that the active respondents in their arguments have not taken into consideration that the claim language in the preamble of all the

asserted claims use the phrases "dot matrix printer" or "dot matrix printer head" as opposed to "wire dot matrix printer" or "wire dot matrix printer head; that the "Abstract" section of each of the specifications of the '377 patent, the '148 patent, and the '472 patent discloses that the invention is "an ink-supply system for a dot matrix printer;" that the title of the specification of each of the sponge patents uses the phrase "dot matrix printer" as opposed to "wire dot matrix printer;" that the specification of each of the sponge patents cites the '846 patent and the '393 patent (which both disclosed that dot matrix printers are not limited to wire-dot matrix printers) and also incorporated the '393 patent by reference; that the prosecution history for each of the sponge patents discloses that the asserted claims of each of the sponge patents were added with the phrase "dot matrix printer" included in the preamble of said asserted claims; that the prosecution history for each of the sponge patents discloses that the titles were amended from "wire dot matrix printer" to "dot matrix printer;" that the prosecution history for the '377 patent, the '148 patent, and the '472 patent discloses that the abstract was amended from referencing "wire dot matrix printer" to referencing "dot matrix printer;" that in the prosecution history of the '957 patent, the applicants stated to the Examiner that they presented claims "for a dot matrix printer" and that "they did not dispute that 'dot matrix printer' covers ink jet printers;" that in the prosecution history of the '439 patent, the applicants stated to the Examiner that they presented claims "for a dot matrix printer taught in the first parent application as filed" and "similar in scope and content to the allowed claims of co-pending application Serial No. 08/405,280;" that in the prosecution history of the '377 patent, the applicants stated to the Examiner that they presented claims "specifically directed ... to dot matrix printers" and that "unlike the claims of the parent applications, the claims of this application are not limited to a wire dot matrix printer;"

and that during the prosecution of each of the sponge patents, the Examiner considered the '519 patent (which disclosed that dot matrix printers are not limited to wire-dot matrix printers). Thus, the administrative law judge rejects the active respondents' argument that the asserted claims of the sponge patents should be limited to any embodiments of said patents.

b. "ink supply port," "ink supply delivery port"[17] and "said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall"

Complainants argued that the claimed phrases "ink supply port" and "ink supply delivery port" should be interpreted as "a structure with an opening for the movement of ink." (CBr at 39.) It is argued that this interpretation is consistent with the meaning the term would have to a person of ordinary skill in the art in question at the time of the invention. (CBr at 39.)

Complainants also argued that it would be appropriate to provide an interpretation of "ink supply port" that describes the position of said "ink supply port." (CBr at 41.) Thus, it is also argued that the claimed phrase "ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall" as "the ink supply being positioned by its passage that is located between the midpoint of the length of the first wall and the second wall." (CBr at 42.) Complainants argued that its proposed interpretation is fully supported by the specification of the '439 patent as well as the language of claims 18 and 81 read in its entirety. (CBr at 42.)

The active respondents argued that the claimed phrases "ink supply port" and "ink supply

---

[17] Some of the asserted claims of the sponge patents use the phrase "ink supply delivery port" and other asserted claims of the sponge patents use the phrase "ink-supply delivery port." The administrative law judge treats the two claimed phrases as the same claimed phrase. Thus, the analysis of the claimed phrase "ink supply delivery port" also applies to the claimed phrase "ink-supply delivery port."

delivery port" should be interpreted as "the grooves of the ink supply guide, which is on the print head side of the printer, and which is received within an opening in the ink cartridge. (RBr at 68.)[18] It is further argued that the specification of the sponge patents discloses that the ink supply guide is compressed against the sponge and ink is moved under capillary action. (RBr at 69.)[19] It is also argued that the specification of the '377 patent discloses that "the ink supply guide 12 and the wire guide 13 jointly form an ink path from the ink tank 2 to the distal or tip end of the wire 11." (RBr at 69.) It is also argued that the specification of the '377 patent discloses that "when arm 12d of the ink supply guide 12 is inserted in ink supply port 41, it fills the port 41 as shown in FIG. 2 and the periphery of grooves 12B adjacent the ink absorbing member 62 actually defines the ink supply port. (RBr at 70.) The active respondents further argued that these cited passages of the specification of the sponge patents show that ink is delivered or transmitted from the ink supply tank, via, inter alia, the supply guide 12, which is inserted into the port 41, and that it is only after the ink supply guide is mated to the port 41 that the ink supply port is actually formed. It is further argued that in the prosecution history of each of the sponge patents, applicants made amendments to each of the specifications that "[acknowledge] and [inform] the public the ink supply port and ink supply delivery port, as used in the claims, should be understood to be the combination of opening 41 and the ink supply guide 12d." (RBr at 70-71.)

---

[18] The active respondents also argued that the claimed phrase "an ink receiving and transmitting member comprising an elongated member ..." should be interpreted as "the grooves of the ink supply guide, which is on the print head side of the printer, and which is received within an opening in the ink cartridge," because the language is intended to cover "the same ink supply deliver port/ ink supply port as used in the other asserted claims of the sponge patents. (RBr at 72.) The administrative law judge will address these arguments in a subsequent section.

[19] It is not clear whether the active respondents intended this to be part of its interpretation of "ink supply port" and "ink supply delivery port." (See RBr at 68-69.)

The active respondents also argued that their interpretation should also apply to the phrase "ink supply port positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer," which is recited in asserted claims 81 and 93 of the '439 patent. (RBr at 71-72.)[20]

The staff argued that the active respondents' proposed definition adds a limitation not found in the claim.[21] It is argued that the plain language of asserted claim 7 of the '957 patent requires a delivery port extending through a wall of the tank housing. (SBr at 27.) It is argued that there is no requirement for an arm or any other structure to complete the port. (SBr at 27.) It is argued that Figure 4 of the '957 patent clearly shows an "ink supply port" 41, as do Figures 9 and 10 of the '957 patent. (SBr at 27.) It is argued that those openings in the ink tank constitute the extent of the port as claimed. (SBr at 27.) It is also argued that the active respondents base their claim interpretation on one sentence of the specification, but take it out of context and incompletely read the prosecution history that added that sentence. (SBr at 27.)

In issue is whether an "ink supply port,"[22] is limited to the grooves of the ink supply

---

[20] The active respondents do not address the phrase "said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall," with respect to the position of the "ink supply port." (See RBr at 68-72.)

[21] The staff does not state whether it adopts complainants' interpretation of the claimed phrases "ink supply port," "ink supply delivery port" and "said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall", nor does the staff offer its own interpretation of said claimed phrases. (See SBr at 27-28.)

[22] The administrative law judge treats the claimed phrases "ink supply port" and "ink supply delivery port" as the same claimed phrase. Thus, the analysis of the claimed phrase "ink supply port" also applies to the claimed phrase "ink supply delivery port."

guide, or whether an "ink supply port" is a structure with an opening for the movement of ink.[23]

With respect to the claim language, the administrative law judge finds that the claimed phrases "ink supply port," "ink supply delivery port" and "said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall" appear in the following context within asserted independent claim 7 of the '957 patent, asserted independent claim 81 of the '439 patent, asserted independent claim 83 of the '377 patent, asserted independent claim 19 of the '148 patent, and asserted independent claims 29 and 38 of the '472 patent[24]:

> an ink supply delivery port extending through a first wall of said tank housing said port having an opening to said interior space to permit the passage of ink from said interior space to the exterior of said tank housing (CX-1 at 10:28-31 (emphasis added).)
>
> ***
>
> said ink-supply tank being formed with an ink supply port positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said first wall for delivery to a dot matrix printer, said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member (CX-2 at 15:44-52 (emphasis added).)
>
> ***

---

[23] Also in issue is the position of an "ink supply port" or "ink supply delivery port. However, the active respondents did not challenge complainants as to the position of an "ink supply port" or an "ink supply delivery port." (See RBr at 68-72.)

[24] Because dependent claim 93 of the '439 patent depends on independent claim 81 of the '439 patent, dependent claim 84 of the '439 patent depends on independent claim 83 of the '377 patent, dependent claim 20 of the '148 patent depends on independent claim 19 of the '148 patent, and dependent claims 31 and 34 depend on independent claim 29 of the '472 patent, said claimed phrases also apply to said dependent claims.

> an ink absorbing member formed of a porous material mounted within said tank, said ink absorbing member having a region facing said opening and being compressingly contained by the ink-supply tank against the ink-supply delivery port so that at least the region of the ink absorbing member facing said opening is compressed relative to at least another region of the ink absorbing member (CX-3 at 19:28-35 (emphasis added).)
>
> ***
>
> an ink-supply tank formed with an ink-supply delivery port (CX-4 at 11:56-57; CX-5 at 12:40-41 (emphasis added).)
>
> ***
>
> storing ink in a ink-supply tank having an ink-supply delivery port (CX-5 at 13:22-23 (emphasis added).)

The administrative law judge finds that the cited claim language of the sponge patents supports the broad interpretation that an "ink supply port" is a structure with an opening for the movement of ink, and that nothing in the cited claim language limits a "ink supply port" to the grooves of the ink supply guide.

With respect to the specification of each of the sponge patents, the administrative law judge finds that each specification discloses the following in the "Summary of the Invention Section," with respect to an ink supply port:

> The ink-supplied wire dot matrix printer head includes a wire guide member having a wire guide hole for guiding the distal end of the wire an ink tank containing an ink absorbing body therein and, an ink supply port in which a portion of the wire guide member is inserted.

(CX-1 at 2:4-8; CX-2 at 2:7-12; CX-3 at 2:3-8; CX-4 at 2:4-9; CX-5 at 2:4-9 (emphasis added).) The administrative law judge further finds that each specification of the sponge patents discloses

that an ink supply port is disclosed in Figures 4, 5, 9 and 10 and describes the characteristics of said ink supply port with respect to Figures 4 and 5:

> The ink tank 2 will now[25] be described in detail with reference to FIG. 4.
>
> ***
>
> The ink tank body 40 has a bottom 40a including a front ink supply port 41 and a front wall air hole 42 defined in a stepped portion thereof. The ink supply guide 12 projecting from the printer head body has an arm 12d inserted in the ink supply port 41. The bottom 40a of the ink tank body has in its raised surface a plurality of slots 45a, 45b, 45c communicating with the ink supply port 41 in confronting relation to the ink supply grooves 12b defined in the arm 12d of the ink supply guide 12.
>
> ***
>
> The ink tank can be attached and detached through the above construction in the following manner:
>
> The holder 70 is supported in the position shown in FIG. 5, and the ink tank 2 is inserted into the holder 70 in the direction of the arrow C.
>
> ***
>
> Now, the ink supply port 41 is positioned correctly above the arm 12d of the ink supply guide 12 projecting upwardly from the head body.

(CX-1 at 4:40-41, 4:49-57, 5:50-54, 5:61-63; CX-2 at 4:49-50, 4:58-66, 5:59-63, 6:3-5; CX-3 at 4:52-53; 4:61-5:2, 5:65-6:1, 6:8-11; CX-4 at 4:52-53, 4:61-5:2, 5:65-6:1, 6:8-11; CX-5 at 4:52-

---

[25] In the specification of the '148 patent, this sentence reads "The ink tank 2 will not be described in detail with reference to FIG. 4. (CX-4 at 4:52-53 (emphasis added).) Based on the rest of the specification of the '148 patent, the administrative law judge assumes that the sentence should read "The ink tank 2 will now be described in detail with reference to FIG. 4. (emphasis added.)

53, 4:61-5:2, 5:65-6:1, 6:8-6:11 (emphasis added).)

The administrative law judge further finds that the following portions of the specifications of the '957 patent, the '377 patent, the '148 patent, and the '472 patent[26] further describes the characteristics of the ink supply port with respect to Figures 9 and 10:

> FIG. 9 of the accompanying drawings illustrates an embodiment of the ink tank construction in accordance with the invention with an ink-impregnated member 160 such as of a porous material being enclosed in tank 140. The illustrated ink tank construction is of a simple shape and can supply a suitable amount of ink to a printer head body under appropriate capillary attraction by the ink-impregnated member. The ink tank can be impregnated with a large quantity of ink while preventing unwanted ink outflow from an air hole 142 and an ink supply port 141.
>
> When ink is supplied from the ink tank of such a construction, ink in the tank remote from the ink supply port flows toward the ink supply port under a pressure difference developed between ink close to the ink supply port and ink remote therefrom as capillary attraction of the ink-impregnated member in the vicinity of the ink supply port is increased due to ink consumption.
>
> ***
>
> If the ink flow is blocked until a pressure differential sufficient to move ink in the ink tank is produced, then ink remote from the ink supply port remains retained and unused, resulting in a short ink supply duration.

(CX-1 at 7:22-38, 7:42-26; CX-3 at 7:44-61, 7:66-8:2; CX-4 at 7:43-59, 7:64-68; CX-5 at 7:44-61, 7:66-8:2 (emphasis added).)

The administrative law judge finds that the cited portions of the specifications of the sponge patents supports the broad interpretation that an "ink supply port" is a structure with an opening for the movement of ink and do not limit the interpretation of "ink supply port" to the

---

[26] The cited portions do not appear in the specification of the '439 patent. (See CX-2.)

grooves of the ink supply guide.

With respect to the prosecution history of each of the sponge patents, in the case of the prosecution history of the '957 patent, as found supra, the applicants amended the specification in a Preliminary Amendment. In said amendment, the applicants, inter alia, added the following sentence to the specification:

> When arm 12d of ink supply guide 12 is inserted in ink supply port 41, it fills the port 41 as shown in FIG. 2 and the periphery of grooves 12b adjacent the ink absorbing member 62 actually defines the ink supply port.

(CX-19, EPS 0143564).[27] In the "Discussion" section of the Preliminary Amendment, the applicants stated:

> The specification has also been amended to insure that there is full verbal support for the claims in this case. Specifically, in reviewing the claims, it was noted that the term "ink supply port" was often used to describe not only the opening 41 (FIG. 4) or 141 (FIGS. 9 and 10) through which the arms 12d of the ink guide member 12 passes, but also to describe the periphery of the groove 12b in said arm 12d when the arm is in position in engagement with the ink absorbing member. (See e.g. original claims 7-9, 12, 18). A sentence was added to page 8, line 29 to insure full support for the claim language (also used in the allowed claims of the parent) without adding any new matter.

(CX-19, EPS 0143574 (emphasis added).)[28]

---

[27] In the prosecution history of the '439 patent, the '377 patent, the '148 patent, and the '472 patent, the applicants made substantially identical amendments to the specifications in the Preliminary Amendment. (See CX-20, EPS 0143764; CX-21, EPS 0144307; CX-22, EPS 0359880; CX-23, EPS 0145590.)

[28] In the prosecution history of the '439 patent, the '377 patent, the '148 patent, and the '472 patent, the applicants made substantially identical statements in the "Discussion" section of the Preliminary Amendment. (See CX-20 EPS 0143789-0143790; CX-21, EPS 0144330-0144331; CX-22, EPS 0359889; CX-23, EPS 0145601.)

The administrative law judge finds that, based on the prosecution history of the sponge patents, the phrase in the specification of each of the sponge patents, "[W]hen arm 12d of ink supply guide 12 is inserted in ink supply port 41 ... the periphery of grooves 12b adjacent the ink absorbing member 62 actually defines the ink supply port" discloses that in the case of the original claims that were in issue with respect to the Preliminary Amendment[29], the phrase "ink supply port" included both ink supply port 41 and the periphery of grooves 12b of the ink supply guide 12 when arm 12d of said ink supply guide 12 was inserted into ink supply port 41. He finds that said phrase does not redefine the meaning of "ink supply port" to mean the periphery of grooves 12b of the ink supply guide 12.

The administrative law judge finds that, with respect to the position of the "ink supply port," the specification of the '439 patent discloses that the position of the "ink supply port" may be identified by reference to the passage that passes through the "ink supply port:"

> Compression in the vicinity of the ink supply port is also achieved where the ink absorbing member overlies the opening (141) in the tank as shown in FIGS. 9 and 10, since arm 12d of ink supply guide 12 is inserted through the opening into compressing engagement with the ink absorbing member in such a construction (compare FIGS. 2, 4, 9 and 10).

(CX-2 at 8:23-29 (emphasis added).)

For the foregoing reasons, the administrative law judge interprets the claimed phrases "ink supply port" and "ink supply delivery port" as:

> a structure with an opening for the movement of ink;

---

[29] The original claims of the patent application that became the '957 patent, that were in issue in the Preliminary Amendment, were canceled by the applicants in a Request For Filing a Continuation Application Under 37 C.F.R. § 1.60, and are not involved in this investigation. (See CX-19, EPS 0143585.)

and the claimed phrase "said ink supply port being positioned at a position between the midpoint of said length of said first wall and said second wall" as:

> the ink supply being positioned by its passage that is located between the midpoint of said length of said first wall and said second wall.

The active respondents argued that the specifications of each of the sponge patents supports its interpretation. (RBr at 69-70.) In support of its interpretation, the active respondents cited the following portion of the specification of the '377 patent:

> The ink supply guide 12 and the wire guide 13 jointly form an ink path from the ink tank 2 to the distal or tip end of the wire 11.
>
> ***
>
> When arm 12d of ink supply guide 12 is inserted in ink supply port 41, it fills the port 41 as shown in FIG. 2 and the periphery of grooves 12b adjacent the ink absorbing member 62 actually defines the ink supply port.

(CX-3 at 4:6-8, 5:5-9 (emphasis added).) The active respondents argued that, based on the cited portions, the specifications of the sponge patents "are unambiguous in their explanation that ink is delivered or transmitted from the ink supply tank via, inter alia, the supply guide 12, which is inserted into the port 41" and that "it is only after the ink supply guide is mated to the port 41 that the ink supply port is actually formed." (RBr at 70.) However, the administrative law judge finds that the cited portion of the specification of the '377 patents states that "[w]hen arm 12d of ink supply guide 12 is inserted in ink supply port 41 ... the ink absorbing member 62 actually defines the ink supply port." (CX-3 at 5:5-9 (emphasis added).) Thus, the administrative law judge finds that the specification of the '377 patent does not redefine the term "ink supply port" as the periphery of the grooves 12b. Instead, he finds that the specification of the '377 patent discloses

that in a specific embodiment, when arm 12d of ink supply guide 12 is inserted in ink supply port 41, the resulting structure is such that the periphery of grooves 12b sets the boundaries of the ink supply port 41. He finds that this is so because Figures 4, 5 and 9 of the specification of each of the sponge patents show ink supply port 41 as a distinct component, separate from the ink supply guide 12 and its periphery grooves 12b.

The active respondents also argued that the grooves of the ink supply guide are compressed against the ink absorbing member to receive and transmit ink from the ink absorbing member under capillary action. (RBr at 69.) They cited the following portion of the specification of the '957 patent:

> Compression in the vicinity of the ink supply port is also achieved where the ink absorbing member overlies the opening (141) in the tank as shown in FIGS. 9 and 10, since arm 12d of ink supply guide 12 is inserted through the opening into compressing engagement with the ink absorbing member in such a construction (compare FIGS. 2, 4, 9 and 10).

(CX-1 at 8:51-56.) However, the administrative law judge finds that said portion of the specification refers to capillary action within the ink absorbing member, not the port. (See CX-1 at 8:51-56.)

Additionally, the administrative law judge finds that the active respondents' arguments have only taken into consideration one portion of the specification of each of the sponge patents, and have not taken into consideration the claim language of asserted independent claim 7 of the '957 patent, asserted independent claim 81 of the '439 patent, asserted independent claim 83 of the '377 patent, asserted independent claim 19 of the '148 patent, and asserted independent claims 29 and 38 of the '472 patent; the "Summary of the Invention" section of the specification

of each of the sponge patents, Figures 4, 5, 9 and 10 of the specification of each of the sponge patents; the cited portions of the specification of each of the sponge patents that describe the characteristics of the "ink supply port" with respect to Figures 4 and 5; the cited portions of the specification of the '957 patent, the '377 patent, the '148 patent, and the '472 patent that describe the characteristics of the "ink supply port" with respect to Figures 9 and 10; and the cited portion of the prosecution history of each of the sponge patents. Thus, the administrative law judge rejects the active respondents' argument that the asserted claims of the sponge patents should be limited to any embodiments of said patents.

c. "ink receiving and transmitting member comprising an elongated member," "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" and "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall"

Complainants argued that the claimed phrases "ink receiving and transmitting member comprising an elongated member" and "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" should be interpreted as "a component structure having an extended length for receiving and transmitting ink." (CBr at 40.) It is argued that this interpretation is consistent with the meaning the term would have to a person of ordinary skill in the art in question at the time of the invention. (CBr at 40.) It is also argued that respondents assert that the term "ink receiving and transmitting member comprising an elongated member" has the same scope as the term "ink supply [delivery] port"and therefore should be construed in

the same manner. (CRBr at 10.) It is further argued that, while complainants disagree with the active respondents' proposed interpretation of both terms, complainants do not disagree that the terms cover the same structures in the preferred embodiments as well as the accused products. (CRBr at 10.)

Complainants argued that it would be appropriate to provide an interpretation of "elongated member" that describes the position of said "elongated member." (CBr at 41.) Thus, it is argued that the claimed phrase "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall" as "the elongated member extending from the first wall into the interior of the tank and positioned by its passage that is located between the midpoint of the length of the first wall and the second wall." (CBr at 42.) Complainants argued that their proposed interpretation is fully supported by the specification of the '439 patent as well as the language of claims 18 and 81 read in its entirety. (CBr at 42.)

The active respondents argued that the claimed phrases "ink receiving and transmitting member comprising an elongated member" and "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" should be interpreted as "the grooves of the ink supply guide, which is on the print head side of the printer, and which is received within an opening in the ink cartridge." (RBr at 72.) It is argued that both complainants' expert Murch, and the active respondents' expert Perry, testified that the claimed language is intended to cover the same ink supply delivery port/ ink supply port as used in the other asserted claims of the

sponge patents. (RBr at 72.) The active respondents argued that the only structure meeting the limitation "elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall, said elongated member being formed with an opening at the distal end thereof and with a passage extending longitudinally therealong" in the asserted claims of the sponge patents is the ink supply guide 12 with grooves 12b that receive and transmit ink. (RBr at 73.)[30]

The staff argued that the claimed phrases "ink supply receiving and transmitting member comprising an elongated member" and "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" should be construed by their plain meaning and that respondents seek to add limitations that are not required by the claim, specification or prosecution history.[31] It is argued that "the claim requires that the elongated member extend 'from said first wall [of the tank] into the interior of said tank.'" (SBr at 30.) It is further argued that the specification does not teach a guide arm that starts at the first wall of the tank and

---

[30] The active respondents do not address the phrase "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall," with respect to the position of the "elongated member." (See RBr at 72-73; RRBr at 11-16.)

[31] The staff does not state whether it adopts complainants' interpretation of the claimed phrases "ink receiving and transmitting member comprising an elongated member," "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" and "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall" nor does the staff offer its own interpretation of said claimed phrases. (See SBr at 29-30.)

continues into the interior of the tank, but rather, the specification teaches that the guide arm (12) has only a small portion extending into the tank when the guide arm is inserted into the tank, with the remainder of the guide arm (12) sitting outside of the tank. (SBr at 30.)

In issue is whether an "ink receiving and transmitting member comprising an elongated member"[32] is limited to the grooves of the ink supply guide, or whether an "ink receiving and transmitting member comprising an elongated member" is a component structure having an extended length for receiving and transmitting ink.

With respect to the claim language, the administrative law judge finds that the claimed phrases "ink receiving and transmitting member comprising an elongated member" and "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall" appear in the following context within asserted independent claims 18 and 149 of the '439 patent[33]:

---

[32] Asserted independent claim 18 of the '439 patent uses the claimed phrase "ink receiving and transmitting member comprising an elongated member," while asserted independent claim 149 of the '439 patent uses the claimed phrase "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member." Despite the different wording, the parties treated the two claimed phrases as identical. (See CFF V.C.102 (undisputed).)

The administrative law judge treats the two claimed phrases as the same claimed phrase. Thus, the analysis of the claimed phrase "ink receiving and transmitting member comprising an elongated member" also applies to the claimed phrase "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member."

[33] Because dependent claims 164 and 165 of the '439 patent depends on independent claim 149 of the '439 patent, the claimed phrases "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from

> an ink receiving and transmitting member comprising an elongated member, said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall, said elongated member being formed with an opening at the distal end thereof and with a passage extending longitudinally therealong from said opening along the length of said elongated member to permit ink to flow away from said opening, at least a portion of said elongated member defining at least said opening and a portion of said passage being defined by a non-porous material, said elongated member engaging a portion of said ink absorbing member at least in the region of said ink absorbing member facing said opening. (CX-2 at 10:44-58 (emphasis added).)
>
> ***
>
> an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member, said elongated member extending into said ink-supply tank from said first side of said first wall, said elongated member being formed with an opening at at [sic] least a distal end thereof and with a passage extending longitudinally therealong from said opening along the length of said elongated member engaging a portion of said ink absorbing member at least in the region of said ink absorbing member facing said opening, at least a region of said elongated member and of said passage extending therealong adjacent said ink absorbing member being essentially free of porous material. (CX-2 at 20:42-58 (emphasis added).)

The administrative law judge finds that the cited claim language of the sponge patents supports the broad interpretation that an "ink receiving and transmitting member" is a component structure having an extended length for receiving and transmitting ink, and that nothing in the

---

said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" and "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall" also apply to said dependent claims.

cited claim language limits a "ink receiving and transmitting member" to the grooves of the ink supply guide.

The administrative law judge further finds that the phrase "ink receiving and transmitting member" is not found in the specification of the '439 patent. (See CX-2.) However, the administrative law judge finds that the claimed phrases "ink receiving and transmitting member comprising an elongated member" and "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" clearly requires a component that receives and transmits ink and includes an elongated component, i.e. a component with an extended length. He also finds that the claimed phrase "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" clearly requires that the component receive ink from the absorbing member and transmit ink from the ink-supply tank through the wall of the ink cartridge to a dot matrix printer.

Based on the claimed phrases, the administrative law judge finds that the specification of the '439 patent discloses that the ink supply port 41 is the claimed "ink receiving and transmitting member."[34] He finds this is so because the specification of the '439 patent discloses

---

[34] The private parties do not dispute that the claimed "ink receiving and transmitting member" is disclosed in the specification of the '439 patent as the ink supply port:

> Both Mr. Perry and Dr. Murch agree that ["ink receiving and transmitting member comprising an elongated member"] is

that the ink supply port is a portion of the ink tank that receives ink from the ink absorbing member of said ink tank and transmits ink through the wall of said ink tank to later be delivered to the dot matrix printer:

> For each ink, the printer head body 1 has in its front portion an ink supply guide 12, shown in FIG. 2, having ink guide grooves 12b with ends leading to the ink-impregnated member 60 and a wire guide 13 having a wire guide hole 13a in which a wire 11 is partly disposed. The ink supply guide 12 and the wire guide 13 jointly form an ink path from the ink tank 2 to the distal or tip end of the wire 11.
>
> ***
>
> The ink tank 2, or each ink tank 2a, 2b, comprises a tank body 40, two ink-impregnated members 61, 62 of a porous material placed in the space in the ink tank body 40, and a lid 50. Ink impregnated members are impregnated with ink under low atmospheric pressure ranging from 5 to 10 mmHg, so that air remaining in the porous ink-impregnated members will be reduced as much as possible to increase the amount of impregnated ink. The ink tank body 40 has a bottom 40a including a front ink supply port 41 and a front wall air hole 42 defined in a stepped portion thereof. The ink supply guide 12 projecting from the printer head body has an arm 12d inserted in the ink supply port 41. The bottom 40a of the ink tank body has in its raised surface a plurality of slots 45a, 45b, 45c

---

> intended to cover the same ink supply delivery port/ ink supply port as used in the other asserted claims of the Sponge patents. (RBr at 72.)
>
> ***
>
> Respondents asserted that the term 'ink receiving and transmitting member comprising an elongated member' has the same scope as the term 'ink supply delivery port' and therefore should be construed in the same manner. Although complainants disagree with respondents' proposed construction of both terms, complainants do not disagree that the terms cover the same structures in the preferred embodiments as well as the accused products. (CRBr at 10.)

> communicating with the ink supply port 41 in confronting relation to the ink supply grooves 12b defined in the arm 12d of the ink supply guide 12. Although not shown, the slots 45a, 45b are joined together to form a single slot, which together with the slot 45c guides the ink into the ink supply grooves 12b. When arm 12d of ink supply guide 12 is inserted in ink supply port 41, it fills the port 41 as shown in FIG. 2 and the periphery of grooves 12b adjacent the ink absorbing member 62 actually defines the ink supply port.
>
> ***
>
> As ink is consumed from the ink tank 2 during printing, ink flows from the porous member 62 through the ink guide grooves 12b, or through the slots 45 and the ink guide grooves 12b into the printer head body.

(CX-2 at 4:1-7, 4:51-5:6, 7:1-4 (emphasis added).)

Thus, the administrative law judge finds that his findings with respect to the specification and prosecution history of the '439 patent, with respect to claimed phrases "ink supply port" and "ink supply delivery port," supra, also apply to the claimed phrases "ink receiving and transmitting member comprising an elongated member," "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member."

The administrative law judge finds that, with respect to the position of the "ink receiving and transmitting member," the specification of the '439 patent discloses that the position of the "ink receiving and transmitting member" may be identified by reference to the passage that passes through the "ink receiving and transmitting member," where the "ink receiving and transmitting member" is defined as the ink supply port of the disclosed embodiment:

> Compression in the vicinity of the ink supply port is also achieved

> where the ink absorbing member overlies the opening (141) in the tank as shown in FIGS. 9 and 10, since arm 12d of ink supply guide 12 is inserted through the opening into compressing engagement with the ink absorbing member in such a construction (compare FIGS. 2, 4, 9 and 10).

(CX-2 at 8:23-29 (emphasis added).)

For the foregoing reasons, the administrative law judge interprets the claimed phrases "ink receiving and transmitting member comprising an elongated member" and "an ink receiving and transmitting member positioned to receive ink from said ink absorbing member and constructed to transmit ink from said ink-supply tank through said wall for delivery to a dot matrix printer, said ink receiving and transmitting member including an elongated member" as:

> a component structure having an extended length for receiving and transmitting ink;

and the claimed phrase "said elongated member extending from said first wall into the interior of said tank at a position between the midpoint of said length of said first wall and said second wall" as:

> the elongated member extending from the first wall into the interior of the tank and positioned by its passage that is located between the midpoint of the length of the first wall and the second wall.

With respect to "ink receiving and transmitting member comprising an elongated member," the active respondents made substantially identical arguments that they made with respect to "ink supply port." (See RBr at 72-73, RRBr at 11-16.) Thus, the administrative law judge rejects their arguments based on the same reasoning stated for "ink supply port," supra.

d. "ink supply tank"[35]

Complainants argued that the claimed phrase "ink supply tank" should be interpreted as "a structure that holds ink for supply to a printer." (CBr at 41.) It is argued that this interpretation is consistent with the meaning the term would have to a person of ordinary skill in the art in question at the time of the invention. (CBr at 41.) It is further argued that the asserted claims of the sponge patents are directed to the tank that supplies ink directly to the print head, referred to as the "ink supply tank." (CRBr at 13.) It is argued that it is this tank that is required to be substantially filled with an ink absorbing member as well as to meet the other structural limitations of the various claims, such as an ink supply port, air hole and projections from the wall or cover. (CRBr at 13.)

The active respondents argued that the claimed phrase "ink supply tank" should be interpreted as "the tank or chamber that holds the volume of ink that will be dispensed to the printing apparatus." (RBr at 78.) It is argued that the asserted claims of the sponge patents make clear that the "ink supply tank" is the entire tank and not an area less than the entire tank. (See RBr at 73-78.) It is argued that claim 7 of the '957 patent, claims 83 and 84 of the '377 patent and claims 19 and 20 each require that the ink absorbing member substantially fill the ink supply tank or chamber that holds the volume of ink that will be dispensed to the printing apparatus. (RBr at 74.) It is argued that this further limitation makes clear that the claims are concerned with an ink absorbing member that holds the capacity of ink held in the ink tank as a whole, not

---

[35] Some of the asserted claims of the sponge patents use the phrase "ink supply tank" and other asserted claims of the sponge patents use the phrase "ink-supply tank." The administrative law judge treats the two claimed phrases as the same claimed phrase. Thus, the analysis of the claimed phrase "ink supply tank" also applies to the claimed phrase "ink-supply tank."

some fraction thereof. (RBr at 74.) It is also argued that claim 164 of the '439 patent, similarly requires, depending from claim 163, "wherein said ink absorbing member carries substantially all of the ink in said ink-supply tank when said ink-supply tank is filled to the designed capacity of the ink-supply tank." (RBr at 74-75.) It is further argued that, again, the language makes clear that the claim is concerned with an ink absorbing member that holds the capacity of ink held in the ink tanks as a whole, not some fraction thereof. (RBr at 75.)

The active respondents further argued that the specification, including all of the figures, of each of the sponge patents, discloses a tank body 40 that is entirely or at least substantially entirely filled with a porous material. (RBr at 75.) Thus, the active respondents argued, it is incorrect for complainants to contend that the plain and ordinary meaning of "ink supply tank" is limited to the portion of the ink tank that carries the ink absorbing member. (RBr at 75-77.)

The active respondents also argued that complainant's proposed interpretation is foreclosed by the prosecution history, in which applicants argued that "ink supply tank" meant the entire tank to distinguish over a cited prior art reference. (RBr at 77.)

The staff argued that the claimed phrase "ink supply tank" should be construed by its plain meaning. (SBr at 26.) It is further argued that respondents' interpretation adds a limitation requiring that "substantially all" of the ink be contained in the tank.[36] It is argued that although the active respondents state that the specification supports their interpretation, they have failed to cite any part of the specification, and moreover, the specification merely provides examples, not claim limitations. (SBr at 26.)

---

[36] The staff does not state whether it adopts complainants' interpretation of the claimed phrase "ink supply tank," nor does the staff offer its own interpretation of said claimed phrase. (See SBr at 26.)

In issue is whether the claimed phrase "ink supply tank" requires that the tank contain the entire volume of ink that will be dispensed to the printer head (i.e. all the ink that will be dispensed to the printer head) or whether said phrase merely requires that the tank contain ink.

With respect to the claim language, the administrative law judge finds that the claimed phrase "ink supply tank" appears either as a preamble to the claim, a limitation where the claimed language describes a "ink supply tank" as having "a first wall and a second wall," or as antecedent in a subsequent limitation. (See CX-1 at 10:24; CX-2 at 10:35, 10:37-41, 10:42-43, 15:35, 15:37-41, 15:42-43, 15:44-52, 16:22-26, 20:35, 20:37-39, 20:40-41, 20:42-58, 21:53-59; CX-3 at 19:23-28, 19:29-36, 19:37-40; CX-4 at 11:54, 11:56-57, 11:58-12:4; CX-5 at 12:40-41, 12:42-43, 13:1-8, 13:22-23, 13:24-14:2.) Thus, the administrative law judge finds that the claim language of the asserted claims do not require a "ink supply tank" to contain the entire volume of ink that will be dispensed to the printer head. Furthermore, to the extent that the claims state a requirement that the ink absorbing member substantially fill the ink tank or the interior space of the ink state, the administrative law judge finds that this is a subsequent limitation aside from the "ink supply tank" limitation, not a requirement that the ink supply tank contain the entire volume of ink.

With respect to the specification of each of the sponge patents, said specification goes into great detail in disclosing an "ink supply tank" (referred to as an "ink tank" in said specification):

> FIG. 1 is an exploded perspective view of a printer head, and FIG. 2 is a vertical cross-sectional view of the printer head constructed in accordance with the invention. An ink tank, shown generally as 2, is detachably mounted by a holder 70 on top of a printer head body 1. The ink tank 2 is of a double construction composed of a

first ink tank 2b for holding black ink and a second ink tank 2a which is divided into three sections for color inks. The inks are impregnated in ink-impregnated members 60 of a porous material which are enclosed in the ink tank 2.

***

The ink tank 2 will now be described in detail with reference to FIG. 4.

The ink tank 2, or each ink tank 2a, 2b, comprises a tank body 40, two ink-impregnated members 61, 62 of a porous material placed in the space in the ink tank body 40, and a lid 50. Ink impregnated members are impregnated with ink under low atmospheric pressure ranging from 5 to 10 mmHg, so that air remaining in the porous ink-impregnated members will be reduced as much as possible to increase the amount of impregnated ink. The ink tank body 40 has a bottom 40a including a front ink supply port 41 and a front wall air hole 42 defined in a stepped portion thereof. The ink supply guide 12 projecting from the printer head body has an arm 12d inserted in the ink supply port 41. The bottom 40a of the ink tank body has in its raised surface a plurality of slots 45a, 45b, 45c communicating with the ink supply port 41 in confronting relation to the ink supply grooves 12b defined in the arm 12d of the ink supply guide 12. Although not shown, the slots 45a, 45b are joined together to form a single slot, which together with the slot 45c guides the ink into the ink supply grooves 12b. When arm 12d of ink supply guide 12 is inserted in ink supply port 41, it fills the port 41 as shown in FIG. 2 and the periphery of grooves 12b adjacent the ink absorbing member 62 actually defines the ink supply port. The ink tank body 40 also has a side wall 40c having on its inner wall a plurality of vertical ridges 47 having lower ends held against the bottom 40a and upper ends kept out of contact with the lid 50. The ink tank body 40 further has a front partition 48 disposed behind the air hole 42 and in front of the ink supply port 41 and having one end joined to the side wall 40c. The tank lid 50 has on a lower surface thereof a plurality of longitudinal ridges 51.

The space or volume defined by the bottom 40a, the side wall 40c, the partition 48, and the lid 50 of the tank body 40 accommodates therein the two porous members 61, 62 as double layers. Porous members 61 and 62 are held in contact only by the raised surface 44 of the bottom 40a, the vertical ridges 47 of the side wall 40c,

> the partition 48, and the ridges 51 of the lid 50. Porous members 61 and 62 have different average pore sizes or diameters. The porous member 61 which has a larger average pore diameter is placed on top of the other porous member 62.

(CX-1 at 3:49-58, 4:40-5:14; CX-2 at 3:58-67, 4:48-5:23; CX-3 at 3:58-68, 4:52-5:29; CX-4 at 3:58-68, 4:52-5:29; CX-5 at 3:58-68, 4:52-5:29 (emphasis added).)

The administrative law judge finds that the specification of each of the sponge patents does not require that the ink tank contain the entire volume of ink that will be dispensed to the printer head. In fact, he finds the fact that one of the preferred embodiments in the specification allows for a "double construction" where the ink tank is comprised of two smaller ink tanks, one holding black ink, and one holding color ink, expressly shows that it is not a requirement that the ink tank contain the entire volume of ink that will be dispensed to the printer head:

> The ink tank 2 is of a double construction composed of a first ink tank 2b for holding black ink and a second ink tank 2a which is divided into three sections for color inks.

(CX-1 at 3:53-56; CX-2 at 3:62-65; CX-3 at 3:63-66; CX-4 at 3:63-66; CX-5 at 3:63-66.)

For the foregoing reasons, the administrative law judge interprets the claimed phrase "ink supply tank" as:

> a structure that holds ink for supply to a printer.

The active respondents argued that complainants' proposed interpretation is foreclosed by the prosecution history, in which applicants argued that "ink supply tank" means the entire tank to distinguish over a cited prior art reference. (RBr at 77.) Specifically, respondents argued, during the prosecution of one of the applications (i.e. Application No. 08/150,676) in the sponge patent family, in order to overcome an obviousness rejection, applicants distinguished a prior art

reference which had a comparable "reservoir" structure to representative cartridge 2 on the grounds that it did not teach "a sponge which substantially filled the tank." (RBr at 77-78.) It is argued that complainants, thus, conceded that the claimed tank or chamber is the entire partitioned structure and cannot take a position now to recapture that scope. (RBr at 78.)

The administrative law judge finds that Application No. 150,676 is the application that became U.S. Patent No. 5,421,658 ("the '658 patent") and is not an application for any of the asserted sponge patents. (See supra.) Thus, the administrative law judge finds that the prosecution history cited by the respondents are for claims that are not asserted in this investigation, and that the claims belong to a patent that is not asserted in this investigation. Furthermore, the administrative law judge finds that the claims of the '658 patent that the Examiner initially rejected on obviousness grounds, application claims 31 and 32 of Application No. 150,676, contain a "unitary piece" limitation that is absent from any of the asserted claims of the asserted sponge patents:

> 31. The dot matrix printer of claim 30, wherein the unitary piece of ink absorbing material substantially fills the ink-supply tank.
>
> 32. The dot matrix printer of claim 30, wherein the unitary piece of ink absorbing material carries substantially all of the ink that said ink-supply tank was designed to hold.

(CX-501 at EPS 0202064 (emphasis added).) Thus, the administrative law judge rejects the active respondents' argument that complainants disavowed any scope of the claimed phrase "ink supply tank," as it appears in the asserted claims of the sponge patents, through its prosecution of the non-asserted '658 patent.

e. "an ink absorbing member substantially filling said interior space of said tank housing," "said ink absorbing member substantially filling said ink-supply tank," "an ink absorbing member formed of a porous material and dimensioned to substantially fill the ink-supply tank," "said ink absorbing member being filled with ink substantially to the desired capacity of the ink-supply tank," and "providing an ink absorbing member formed of a porous material in said ink-supply tank so that substantially the desired capacity of ink for said ink-supply tank is carried by the ink absorbing member"

Complainants argued that the claimed phrase "substantially filling" as it appears in the claimed phrases "an ink absorbing member substantially filling said interior space of said tank housing" and "said ink absorbing member substantially filling said ink-supply tank" should be interpreted as "largely but not necessarily wholly filling" and that the claimed phrase "substantially fill" as it appears in the claimed phrase "an ink absorbing member formed of a porous material and dimensioned to substantially fill the ink-supply tank" should be interpreted as "largely but not necessarily wholly fill." (CBr at 45.) Complainants also argued that the claimed phrase "substantially to the desired capacity of the ink-supply tank" as it appears in the claimed phrase "said ink absorbing member being filled with ink substantially to the desired capacity of the ink-supply tank" should be interpreted as "largely but not necessarily wholly all of the ink that the tank could be desired to hold." (CBr at 44.) Complainants further argued that the claimed phrase "substantially the desired capacity of ink" that appears in the claimed phrase "providing an ink absorbing member formed of a porous material in said ink-supply tank so that substantially the desired capacity of ink for said ink-supply tank is carried by the ink absorbing member" should be interpreted as "largely but not necessarily wholly all of the ink that the tank is designed to hold." (CBr at 45.) Complainants argued that these definitions are consistent with the meaning the terms would have to a person of ordinary skill in the art in question at the time of the invention. (CBr at 44-45.)

The active respondents argued that said claimed phrases make clear that the asserted claims are concerned with an ink absorbing member that holds the capacity of ink held in the ink tank as a whole, and not some fraction thereof. (RBr at 74-75.) It is argued that thus an "ink supply tank" should be interpreted as "the tank or chamber that holds the volume of the ink that will be dispensed to the printing apparatus." The active respondents did not offer an interpretation for the claimed phrases "substantially filling," "substantially fill," "substantially to the desired capacity of the ink-supply tank" and "substantially the desired capacity of ink." (See RBr at 73-78; RRBr at 20-23.)

The staff did not offer an interpretation of said claimed phrases. (See SBr at 19-31; SRBr at 1-3.)

The administrative law judge finds that the plain and ordinary meaning of the claimed phrase "substantially" is "largely but not necessarily completely." He further finds that the claimed phrase "substantially filling" and claimed phrases using similar language are separate limitations than "ink supply tank." As the administrative law judge has already rejected the active respondents' interpretation of "ink supply tank," he rejects their arguments that the "substantially filling" limitations of the asserted language require the administrative law judge to adopt their interpretation of "ink supply tank."

For the foregoing reasons, the administrative law judge interprets the claimed phrase "an ink absorbing member substantially filling said interior space of said tank housing" as:

> an ink absorbing member largely but not necessarily completely filling said interior space of said tank housing;

the claimed phrase "said ink absorbing member substantially filling said ink-supply tank" as:

> said ink absorbing member largely but not necessarily completely filling said ink-supply tank;

the claimed phrase "an ink absorbing member formed of a porous material and dimensioned to substantially fill the ink-supply tank" as:

> an ink absorbing member formed of a porous material and dimensioned to largely but not necessarily completely fill the ink-supply tank;

the claimed phrase "said ink absorbing member being filled with ink substantially to the desired capacity of the ink-supply tank" as:

> said ink member being filled with ink largely but not necessarily completely all of the ink that the tank could be desired to hold;

and the claimed phrase "substantially the desired capacity of ink" that appears in the claimed phrase "providing an ink absorbing member formed of a porous material in said ink-supply tank so that substantially the desired capacity of ink for said ink-supply tank is carried by the ink absorbing member" as:

> providing an ink absorbing member formed of a porous material in said ink-supply tank so that largely but not necessarily wholly all of the ink that the tank is designed to hold is carried by the ink absorbing member.

f. "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port"

Complainants did not offer an interpretation of the claimed phrase "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port." (See CBr at 30-45; CRBr at 3-16.) Complainants argued that the active respondents' interpretation of said claimed phrase "relies on their improper construction of 'ink

supply port' from the preferred embodiment to conclude 'the opening to said ink supply delivery port' refers only to the grooves of the ink supply guide. (CRBr at 11.)

The active respondents argued that the claimed phrase "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port" should be interpreted as "the ink absorbing member must engage the opening, guide grooves 12b, of the ink supply guide 12."[37] (RBr at 78.) It is argued that the ink supply delivery port is formed by the grooves 12b in the ink supply guide 12 that is received within the opening in the cartridge. (RBr at 78.) It is also argued that it is the physical connection between the grooves in the ink supply guide and the ink absorbing member that permits ink to be received and transmitted through the grooves in the ink supply guide to the wires of the wire dot matrix printer. (RBr at 78-79.)

The staff did not offer an interpretation of the claimed phrase "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port." (See SBr at 19-31; SRBr at 1-3.)

The administrative law judge has already rejected the active respondents' interpretation of "ink supply delivery port." (See, supra.) Thus, because said interpretation of "engaging said opening" is solely based on their incorrect interpretation of "ink supply delivery port," he rejects the active respondents' interpretation of "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port." Thus, he finds that said claimed phrase is governed by its plain and ordinary meaning.

---

[37] The active respondents do not offer an interpretation for "engaging said opening." (See RBr at 78-79; RRBr at 23.)

g. "said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member"

Complainants did not offer an interpretation of the claimed phrase "said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member." (See CBr at 30-45; CRBr at 3-16.) Complainants argued that the active respondents "incorporate their misguided interpretation of 'ink supply [delivery] port' to conclude that the "ink supply port being free of porous material" covers only the grooves 12b of ink supply guide 12." (CBr at 11.)

The active respondents argued that the claimed phrase "said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member" should be interpreted as "the opening, guide grooves 12b, of the ink supply guide 12 being free of porous material."[38] (RBr at 80.) It is argued that the sponge patents disclose an embodiment of an ink supply guide with a guide groove 12b that is free of porous material and an ink supply guide with guide grooves 12b having a porous material. (RBr at 80.)

The staff did not offer an interpretation of the claimed phrase "said ink absorbing member having a region facing and at least in part engaging said opening to said ink supply delivery port." (See SBr at 19-31; SRBr at 1-3.)

The administrative law judge has already rejected the active respondents' interpretation of "ink supply port." (See, supra.) Thus, because said interpretation of "free of porous material" is solely based on its incorrect interpretation of "ink supply port," he rejects their interpretation of "said ink supply port being free of porous material at least in the region thereof facing said ink absorbing member." Thus, he finds that said claimed phrase is governed by its plain and

---

[38] The active respondents do not offer an interpretation of "free of porous material." (See RBr at 79-81; RRBr at 23.)

ordinary meaning.

B. Chip Or Contact Family

The chip or contact family comprises U.S. patent 6,502,917 (the '917 patent, CX-7), and U.S. patent 6,550,902 (the '902 patent, CX-8.) The '917 patent entitled "Ink-Jet Printing Apparatus And Ink Cartridge Therefor," issued on January 7, 2003, based on an application filed on January 18, 2000. The '917 patent claims an effective filing date through a continuation-in-part application filed on May 18, 1999.[39] The '902 patent entitled "Ink-Jet Printing Apparatus And Ink Cartridge Thereof," issued on April 22, 2003, based on an application filed on April 12, 2002. The '902 patent claims an effective filing date through a divisional and continuation-in-part applications to May 18, 1999.[40] The '902 patent derives from a divisional application filed

---

[39] The '917 patent states:

> This is a continuation-in-part of PCT Application No. PCT/JP99/02579, filed May 18, 1999, which claims benefit of priority based on Japanese and PCT Application Ser. 10-151883, filed May 18, 1998, 10-151882, filed May 18, 1998, 10-180519, filed Jun. 26, 1998, 10-266109, filed Sep. 21, 1998, 10-301782, filed Oct. 23, 1998, and 11-78843, filed Mar. 24, 1999.

(CX-7 at 1:6-13.)

[40] The '902 patent states:

> This application is a division of U.S. patent application Ser. No. 09/484,458, entitled "Inkjet Printing Apparatus and Ink Cartridge there of" filed on Jan. 18, 2000, which is a continuation-in-part of PCT Application No. PCT/JP99/02579, filed May 18, 1999, which claims benefit of priority based on Japanese Patent Application Nos. 10-151883, filed May 18, 1998, 10-151882, filed May 18, 1998, 10-180519, filed Jun. 26, 1998, 10-266109, filed Sep. 21, 1998, 10-301782, filed Oct. 23, 1998, and 11-78843, filed Mar. 24, 1999.

from the '917 patent, and thus the two patents share a common specification. (CX-8 at 1:6-15.)

Complainants have referred to the '917 and '902 patents as the "Shinada 'Chip' Family"[41] (CBr at 24.) While the active respondents have referred to said patents as the "Contact Patents" (RBr at 8-9), their RFF 10.2 reads in part "[t]he Shinada chips patent family is made of the '917 and '902 Patents."

The abstract of each of the '917 and '902 patents states:

> An ink jet type printing apparatus in which an ink supply needle is located near one side in a direction perpendicular to the reciprocated directions of a carriage, a circuit board is mounted on a wall of an ink cartridge in the vicinity of the side on which an ink supply port is formed and plural contacts for connecting to external control means are formed on the exposed surface of the circuit board.

(CX-7 and CX-8.) Moreover, it is undisputed that the '917 and '902 patents are directed to an on axis ink cartridge having a semiconductor device for storing information for use in an ink jet printer and that the invention is more particularly described as follows:

> The present invention is made in view of such a problem and an object of which is to provide an ink-jet printing apparatus wherein data stored in semiconductor storage means can be prevented from being lost independent of unsuitable operation for attaching or detaching an ink cartridge.

('902 Patent, Col. 2, lines 3 - 8; CX-8.) (RFF10.3 (undisputed).)

1. Asserted Claims Of The Chip Or Contact Family (The '917 And '902 Patents)

Complainants asserted claims 1, 2, 3, and 9 of the '917 patent. Said claims are set forth, infra.

1. An ink cartridge for mounting on a carriage of an inkjet printing apparatus and for

---

(CX-8 at 1:6-15.)

[41] Satoshi Shinada is a named inventor on each of said patents.

supplying ink to a printhead of said ink jet printing apparatus through an ink supply needle, the ink cartridge comprising:

a plurality of external walls, including a first wall and a second wall, defining at least some of a chamber;

an ink supply port for receiving said ink supply needle, the ink supply port having a centerline and communicating with the chamber,

a semiconductor storage device storing information about the ink carried by said cartridge; and

a plurality of contacts for connecting the semiconductor storage device to the ink jet printing apparatus, the contacts being formed in a plurality of rows lying essentially in a plane parallel to the centerline of the ink supply port, each said row being centered relative to the centerline of said ink supply port.

2. The ink cartridge according to claim 1, wherein said semiconductor storage device is disposed on said second wall of said housing.

3. The ink cartridge according to claim 1, wherein said semiconductor storage device is disposed on said second wall of said housing in the vicinity of said ink supply port.

9. An ink cartridge for mounting on a cartridge of an ink jet printing apparatus and for supplying ink to a printhead of said ink jet printing apparatus through an ink supply needle, the ink cartridge comprising:

a plurality of external walls defining at least some of a chamber;

an ink supply port for receiving said ink supply needle, the ink supply port having an exit opening and a centerline and communicating with the chamber;

a semiconductor storage device storing information about the ink carried by said cartridge; and

a plurality of contacts for connecting said semiconductor storage device to the ink jet printing apparatus, the contacts being formed in a plurality of rows so that one of said rows is closer to said exit opening of said ink supply port than an other of said rows, the row of said contacts which is closest to said exit opening of said ink supply port being longer than the row of said contacts which is furthest from said exit opening of said ink supply port.

Complainants asserted claims 1, 31, and 34 of the '902 patent. Said claims are set forth, infra.

1. An ink cartridge for an ink jet printing apparatus having a printhead which ejects ink droplets onto a recording medium, the printhead having an ink supply needle, and is mounted on a movable carriage, the ink cartridge comprising:

a housing containing an ink therein and configured for removable mounting on the printhead, said housing having a first wall and a second wall, the second wall having both a first upper corner and a second upper corner;

an ink supply port formed on said first wall for receiving the ink supply needle of the printhead and supplying the ink from said housing to the printhead, the ink supply port having an exit opening and a centerline;

a semiconductor storage device storing information about the ink disposed on said housing;

at least two electrical contacts on said second wall and allowing electrical communication between the semiconductor storage device and the ink jet printing apparatus, the contacts lying in at least a first row and a second row, the first row being closer to a line connecting the first and the second upper corner than the second row; and

a first overhang disposed between the first upper corner and the second upper corner.

31. An ink cartridge for an ink jet printing apparatus having a printhead which ejects ink droplets onto a recording medium, the printhead having a ink supply needle, and is mounted on a movable carriage, the ink cartridge comprising:

a housing containing an ink therein and configured for removable mounting on the printhead, said housing having a first wall and a second wall, the second wall having both a first upper corner and a second upper corner;

an ink supply port formed on said first wall for receiving the ink supply needle of the printhead, having an exit opening, and supplying the ink from said housing to the printhead;

a semiconductor storage device storing information about the ink disposed on said housing;

at least two electrical contacts for connecting the semiconductor storage device to the ink jet printing apparatus, and

at least a first overhang member extending beyond a plane of the wall of said housing where said contacts are disposed, the first overhang member being located between the first upper corner and the second upper corner.

34. The ink cartridge according to claim 31, wherein, viewing the ink cartridge in a direction perpendicular to a plane of the contacts, at least one of said contacts is intersected by a plane passing through the centerline of said ink supply port.

The parties have put in issue the following claimed language identified infra for interpretation.

a. "contacts"

In issue is said claimed phrase, which is found in asserted claims 1 and 9 of the '917 patent and asserted claims 1, 31 and 34 of the '902 patent. (CX-7; CX-8.)[42]

Complainants argued that the term "contacts" as used in the asserted claims of the '917 and '902 patents has a plain and ordinary meaning as the physical junction or connection between two conductive materials; that a scientific dictionary defines "contact" as "a connection between two conductors that allows an electric current to flow"; that these definitions properly draw a distinction between the entire area of conductive material—the conductor—and the portion of conductive material—the contact—that physically touches the other conductor; that accordingly, complainants propose the construction of "contacts" as "the portions of conductive material that contact the printer contacts when mounted"; and that said construction is consistent with the plain and ordinary meaning of "contacts" and is supported by the specification of the asserted patents. (CBr at 45-6.)

---

[42] As indicated supra, the '902 patent derives from a divisional application filed from the '917 patent, and thus the two patents share a common specification.

The active respondents argued that each of asserted claims 1, 2, 3 and 9 of the '917 patent requires a "plurality of contacts," and each of asserted claims 1, 31 and 34 of the '902 patent requires "at least two electrical contacts"; that a contact is a physically and electrically discrete electrode; that the active respondents' expert Perry testified that contacts should be interpreted as electrically and physically discrete contacts or electrode of the type designated by reference numeral 60 in, for example, Figure 7(a) of the '917 patent; and that Perry's interpretation is required by plain and ordinary meaning of the claims as supported by the '917 and '902 patents. (RBr at 83.)

The staff argued that a correct construction of "contact" is "a conducting part that co-acts with another conducting part to make or break a circuit," but it does not include electrical leads to the part; that a definition that requires a "conducting part" is consistent with the specification, which repeatedly shows that a "contact" is a physical structure that is used for conducting electricity between a cartridge and a printer, but that the leads to such structure are not considered part of the contact; that Fig. 7 of the '917 patent shows the contacts (60) as cartridge-side rectangular electrodes; that the electrical leads, shown as items 86 and 87 of Fig. 20, are not considered part of the contact, but instead are referred to as follows: "conductive patterns 86 and 87 are formed between a column of contacts 85-1 to 85-5"; that the specification thus provides an explanation for what is meant by the term "contacts." (SBr at 33.) It is argued that neither claim construction offered by the private parties is correct; that complainants' proposed construction is incorrect because it relies on the printer to help define the physical structure of the "contacts" on the ink cartridge, whereas claim limitations concerning a printer are absent from the claim; and that respondents' proposed construction also is erroneous because it attempts to import the

specific example of contacts shown in the specification into the definition. (Id. at 33-4.)

In issue is whether the claimed phrase "contacts" should be limited to the electrodes of the type designated by reference numeral 60 in, for example, Figure 7(a) of the '917 patent or whether "contacts" should be interpreted to include other examples of embodiments disclosed in the '917 patent.

At the outset, the private parties agreed that the term "contacts" as used in asserted independent claims 1 and 9 of the '917 patent and asserted independent claims 1 and 31 of the '902 patent should be interpreted in the same manner. (CFF V.C.165 (undisputed).)

Each of the preambles of the asserted claims 1 and 9 of the '917 patent recites:

> An ink cartridge for mounting on a carriage of an inkjet printing apparatus and for supplying ink to a printhead of said ink jet printing apparatus through an ink supply needle, the ink cartridge comprising:[43]

(CX-7 at 11:31-34, 12:10-13 (emphasis added).) Similarly, each of the preambles of the asserted claims 1 and 31 of the '902 patent recites:

> An ink cartridge for an ink jet printing apparatus having a printhead which ejects ink droplets onto a recording medium, the printhead having an ink supply needle, and is mounted on a movable carriage, the ink cartridge comprising:

(CX-8 at 11:31-34, 12:10-13 (emphasis added).) Hence, the administrative law judge finds that the plain language of each of the preambles of the asserted claims 1 and 9 of the '917 patent and

---

[43] While said preamble of claim 9 actually recites "[a]n ink cartridge for mounting on a cartridge of an inkjet printing apparatus," the administrative law judge finds that the second recitation of the term "cartridge" is clearly in error and thus said preamble of claim 9 should correctly read "[a]n ink cartridge for mounting on a carriage of an inkjet printing apparatus." The administrative law judge finds no evidentiary support for mounting an ink cartridge on "a cartridge of an inkjet printing apparatus."

asserted claims 1, 31, and 34 of the '902 patent shows that each of said claims is directed to an ink cartridge which is mounted on a carriage of "an inkjet printing apparatus," i.e., an inkjet printer.

Each of the asserted claims 1 and 9 of the '917 patent and asserted claim 31 of the '902 patent includes an identical claimed phrase "contacts for connecting the semiconductor storage device to the ink jet printing apparatus" as part of its fourth clause.[44] Hence, the plain language of each of said asserted claims shows that "contacts" are for connecting the semiconductor storage device to the ink jet printing apparatus.

Likewise, asserted claim 1 of the '902 patent includes a similar concept for "contacts." Said claim 1 includes a claimed phrase "electrical contacts on said second wall and allowing electrical communication between the semiconductor storage device and the ink jet printing apparatus" as part of its fourth clause. Thus, the plain language of the asserted claim 1 of the '902 patent, in describing the environment in which the claimed cartridge is to operate,[45] shows that "contacts" are for allowing electrical communication between the semiconductor storage device and the ink jet printing apparatus.

Based on the plain language of the asserted claims of the '917 and '902 patents, the administrative law judge finds that "contacts" are for connecting the semiconductor storage device to the ink jet printing apparatus, or for a similar function, i.e., allowing electrical

---

[44] Said asserted claim 31 of the '902 patent qualifies "contacts" as "electrical contacts."

[45] See In re Stencil 828 F.2d 751 (Fed. Cir. 1987), where the Federal Circuit concluded that, as a matter of claim draftsmanship, a patentee is not barred from describing an invention "in terms of the structure imposed upon it" by the environment in which it is intended to operate. Id. at 752.

communication between the semiconductor storage device and the ink jet printing apparatus.

Consistent with the plain language of the asserted claims, the Abstract section of the '917 and '902 patents states:

> An ink jet type printing apparatus in which an ink supply needle is located near one side in a direction perpendicular to the reciprocated directions of a carriage, a circuit board is mounted on a wall of an ink cartridge in the vicinity of the side on which an ink supply port is formed and plural contacts for connecting to external control means are formed on the exposed surface of the circuit board.

(CX-7 and CX-8 (emphasis added).) Hence, the Abstract discloses that contacts are "formed on the exposed surface of the circuit board" (where the circuit board is mounted on the ink cartridge) and that contacts are used for "connecting to external control means." The administrative law judge finds that the concept that "contacts" are for connecting the semiconductor storage device to the ink jet printing apparatus is supported by the Abstract since an ink jet printing apparatus is "external" to the ink cartridge, and the Abstract discloses that contacts are formed on the circuit board which is mounted on the ink cartridge and said contacts are connected to a control means which is external to the ink cartridge.

The administrative law judge finds that the written disclosures and the figures in the specification of the '917 patent are consistent with the plain language of the asserted claims, i.e., the "contacts"[46] are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted. For example, describing

---

[46] The said portions of the specification refer to element 60 as both "contacts" and "electrodes."

Figure 7, which consists of FIGS. 7(a)-(c),[47] the specification of the '917 patent states:

> Contacts 60 in plural rows in a direction in which the cartridge is inserted, in two rows in this embodiment, are formed in a position respectively opposite to the contact forming members 29 and 29' of the above contact mechanism 24 on the side of the surface when the circuit board is attached to the ink cartridge of the circuit board 31 as shown in FIG. 7(a). A semiconductor storage means 61 may be mounted at the rear surface of the circuit board 31 so that the semiconductor storage means is connected to these contacts 60 and, if necessary, is molded by ink-resistant material and is kept unexposed. The semiconductor storage means 61 may store data of the quantity of ink housed in the ink cartridge 40 or 50 to which the semiconductor storage means is provided, the manufacturing date of the ink, its trademark and the like. If required, the semiconductor storage means 61 stores data such as a maintenance status transmitted from the body of the printing apparatus. A reference number 60' denotes an electrode used for a check during its manufacturing process. The electrode 60' is grounded when used.
>
> As shown in FIG. 7, the electrodes 60 are distanced from an edge of the circuit board 31 or from a position of the circuit board where a contact member of the printing apparatus first comes into abutment when the ink cartridge is mounted on the printing apparatus. Such arrangement is advantageous in that the electrodes 60 on the circuit board 31 can be protected from a damage which might be given to the electrodes 60 when the circuit board 31 comes into abutment with the contact member of the printing apparatus. Further, since the electrodes 60 are distanced from the edge of the circuit board 31, it is easy to control the position of the circuit board 31 with respect to the contact member of the printing apparatus.
>
> Out of electrodes 60 formed on the circuit board 31, for a small electrode 60-1 shown in FIG. 7(c), the height H1 may be 1.8 mm and the width W1 1 mm, for a large electrode 60-2, the height H2 may be 1.8 mm and the width W2 is 3 mm. Particularly, contact with the contact forming members 29 can be secured by forming

[47] The specification states: "FIGS. 7(a) to 7(c) show an embodiment of a circuit board mounted on the ink cartridge in relation to its superficial and rear structure and the size of an electrode and FIGS. 7(d) and 7(e) show a state of contact with a contact." (CX-7 at 2:33-36.)

the small electrode 60-1 in a rectangle in which the length in the inserted direction of the ink cartridge 40 or 50 is longer than that in the other direction, minimizing the width W1 of the electrode even if there is a lift Δh between the ink cartridge 40 or 50 and the holder 4 as shown in FIG. 11(c).

* * *

When the installation of the ink cartridge 40 or 50 is finished, the contact forming member 29a of the contact mechanism 24 comes in contact with the electrodes in the upper row out of the electrodes shown in FIGS. 7(d) and 7(e) and the contact forming member 29'a comes in contact with the electrodes in the lower row. Two contact forming members 29 are in contact with the electrode 60-2 arranged in the center in the lower row. The two contact forming members 29 touched to the electrodes 60-2 are grounded and it can be judged by detecting conduction between these on the side of the printing apparatus whether the ink cartridge 40 or 50 is installed or not. Further, as the width W2 of the electrode 60-2 is larger than that of the other electrode 60-1 and the electrode 60-2 is located on the central line of the ink supply port, the electrode 60-2 securely comes in contact with the contact forming member 29'. As the electrodes 60-1 and 60-2 are exposed and a user can check them easily in case the failure of contact is verified, the electrodes are simply wiped by cloth and others and conduction can be recovered. As shown in FIG. 7, the electrode 60-2 is disposed on the same side of the circuit board 31 as the other electrodes 60-1, 61-1 are formed.

(CX-7 at 5:26-6:2, 7:39-60 (emphasis added).) Thus, the administrative law judge finds that the specification above shows that "contacts" are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted. This is so because the specification above shows that the semiconductor storage means is connected to the contacts 60 and "[t]he two contact forming members 29 touched to the electrodes 60-2 are grounded and it can be judged by detecting conduction between these on the

side of the printing apparatus whether the ink cartridge 40 or 50 is installed or not." In other words, when the ink cartridge is installed, the "two contact forming members 29" are connected or "touched to the electrodes 60-2," and conduction will be detected, indicating a connection or electrical communication between the semiconductor storage device and the ink jet printing apparatus. Further, the deformation of the contact-forming members when they touch the printed circuit board is also depicted in Figures 7(d) and 7(e). (CFF V.C.180 (undisputed by respondents); Murch, Tr. at 756:4-23, 759:25-760:13; Perry Tr. at 1707:19-23.) Moreover, as seen in Figure 7(e), contact-forming member 29'b is a bent arm that touches the electrode 60. (CFF V.C.181 (undisputed by respondents); Murch, Tr. at 759:25-760:13.) Hence, the administrative law judge finds that Figures 7(d) and 7(e) show a connection or electrical communication between the semiconductor storage device and the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted.

The administrative law judge also finds that the portions of the specification of the '917 patent describing the various embodiments shown in Figures 16, 17, which consists of FIGS.17(a) and 17(b), 18, which consists of FIGS. 18(a)-(c), and 19,[48] also show that "contacts"

---

[48] As to what said figures are, the specification states:

> FIG. 16 is a sectional view showing another embodiment of the head holder and the ink cartridge respectively in the above printing apparatus,
>
> FIGS. 17(a) and 17(b) are respectively a plan and a side view showing an embodiment of the contact provided to the above head holder, and
>
> FIGS. 18(a) to 18(c) are respectively a front view, a side view and

are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted. Thus, the specification of the '917 patent states:

> FIG. 16 shows an embodiment in case a circuit board is arranged at the bottom in the vicinity of an ink supply port or an ink cartridge, an ink supply needle 6 communicating with a print head 5 is planted at the bottom of a carriage and a board 81 on which elastically transformable contacts 80-1, 80-2, . . . 80-6 formed by a spring are formed is provided in a position possibly adjacent to the ink supply needle 6 as shown in FIGS. 17(a) and 17(b).
>
> In the meantime, an ink supply port 14 which can be fitted to the ink supply needle 6 is provided at the bottom of an ink cartridge 40, a concave portion 82 is formed in a position possibly close to the ink supply port 14 and in a position opposite to the contact board 81 and a circuit board 83 is fixed diagonally so that the circuit board has an angle θ with each vertex of the contacts 80-1 to 80-6. It is preferable that the circuit board 83 may be diagonal with respect to a plane perpendicular to a direction in which the ink cartridge is mounted on the printing apparatus.
>
> Through holes 83a and 83b for a positioning are formed on the circuit board 83 as shown in FIG. 18(a), semiconductor storage means 84 is mounted on the surface on the side of an ink housing chamber, that is, at the back as shown in FIGS. 18(b) and 18(c) and contacts 85-1, 85-2, . . . 85-6 connected to the data input terminal and the driving power supply terminal of the semiconductor storage means 84 for acquiring conduction to the contacts 80-1 to 80-6 on the side of the carriage, are formed on the side of the exposed surface.

> a rear view showing a contact board mounted on the above ink cartridge.
>
> FIG. 19 is a sectional view showing first conduction in a process for inserting the ink cartridge.

(CX-7 at 2:53-64.)

As the semiconductor storage means 84 is mounted at the rear surface of the circuit board 83 as described above, the degree of freedom in arranging the contacts is enhanced. The surface and the rear of the circuit board 83 can be effectively utilized and electrodes to be the contacts 85-1, 85-2, . . . 85-6 can be formed in area to the extent that the reliability of connection can be secured. A molding agent can be readily applied to the surface on which the semiconductor storage means 84 is formed without considering whether application precision is high or not to prevent from adhering to the contacts 85-1, 85-2, . . . 85-6 and the manufacturing process can be simplified.

Further, because the semiconductor storage means 84 is mounted on the cartridge with the status hidden by the circuit board 83, a user can be prevented from touching to the storage means unintentionally, liquid such as ink can be prevented from adhering to the storage means, and electrostatic destruction and an accident caused by a short circuit can be also prevented.

The semiconductor storage means 84 is connected to control means not shown of the printing apparatus via the contacts 85-1, 85-2, . . . 85-6 and the contacts 80-1 to 80-6, data stored in the semiconductor storage means is read and data such as the quantity of ink consumed by printing operation is written to the means.

In another arrangement, the circuit board 83 may be diagonal with respect to a direction in which the ink cartridge 40 is mounted on the printing apparatus.

In this embodiment, when the ink cartridge 40 reaches the vicinity of the bottom of the carriage in case the ink cartridge 40 is installed, the ink supply needle 6 enters the ink supply port 14 as shown in FIG. 19, forms a passage, the contacts 80-1 to 80-3 near one side of the circuit board 83 having an angle θ with a horizontal plane first come in contact with the contacts 85-1 to 85-3 and conduction is acquired.

When the cartridge 40 further is further lowered, the contacts 80-4 to 80-6 near the other side of the circuit board 83 come into contact with the contacts 85-4 to 85-6 and all contacts become conduction.

Therefore, power is supplied to the semiconductor storage means 84 through the contacts 80-1 to 80-3 and the contacts 85-1 to 85-3

> by which conduction is first acquired so as to initialize the semiconductor storage means 84. Data can be prevented from being lost by accessing to data stored in the semiconductor storage means 84 via the contacts 80-4 to 80-6 and the contacts 85-4 to 85-6 which become conduction after the above conduction is acquired.
>
> In the meantime, when the ink cartridge 40 is pulled out from the carriage, termination processing can be executed by power still supplied by the contacts 80-1 to 80-3 and the contacts 85-1 to 85-3 and afterward, power can be turned off through the contacts 80-4 to 80-6 and the contacts 85-4 to 85-6 are first disconnected. When processing for the semiconductor storage means 84 finishes as described above, the ink supply needle 6 is pulled out from the ink supply port 14.

(CX-7 at 8:35-9:53 (emphasis added).) Hence, Figures 16, 17(a) and 17(b) show "elastically transformable contacts 80-1, 80-2, . . . 80-6 formed by a spring" (on the carriage of the printer),[49] whereas Figures 18(a) and (b) show contacts on the ink cartridge which are similar to the contacts shown in Figures 7(a) - (e). Further, the administrative law judge finds that the specification, supra, shows that "contacts" are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted. For example, as seen supra, "[t]he semiconductor storage means 84 is connected to control means not shown of the printing apparatus via the contacts 85-1, 85-2, . . . 85-6 and the contacts 80-1 to 80-6."[50] Stated slightly differently, "contacts" are the parts which connect the "semiconductor

---

[49] This portion of the specification describing Figures 16, 17(a) and 17(b) shows that the claimed phrase "contacts" broadly encompasses contacts on the carriage of the printer in addition to the contacts on the ink cartridge. However, as each of the preambles of the asserted claims states, only "contacts" which are part of the ink cartridge are included in the asserted claims.

[50] In addition, the description of "contacts" in this sentence is consistent with that of the Abstract's description, which states: "plural contacts for connecting to external control means are

storage means 84" to the control means of the printing apparatus, indicating a connection or electrical communication between the semiconductor storage device and the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted.

The administrative law judge further finds that the portions of the specification of the '917 patent describing the various embodiments shown in Figures 21, 22 and 23, which consists of FIGS. 23(a)-(d),[51] further show that "contacts" are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted:

> FIG. 21 shows another preferred embodiment of the present invention in which a circuit board 83' on which contacts 85-1' to 85-6' formed such as to be secured horizontally at the bottom of an ink cartridge 40 while the circuit board is always pressed upward by a spring or the like. Aboard 81' on which two columns of contacts 80-l' to 80-3' and contacts 80-4' to 80-6' are formed is

---

formed on the exposed surface of the circuit board." (CX-7.)

[51] The specification states:

> FIG. 21 is a sectional view showing the other embodiment of the head holder and the ink cartridge respectively in the printing apparatus according to the present invention, and
>
> FIG. 22 is a sectional view showing first conduction in the process for inserting the ink cartridge in the above printing apparatus.
>
> FIGS. 23(a) to 23(d) are respectively plans and side views showing the other embodiment of the present invention in relation to the arrangement of the contacts.

(CX-7 at 3:1-9.)

formed in such a manner that difference g in a level is made between the tip ends of the two columns is provided.

Also in this embodiment, as shown in FIG. 22, as the first column of contacts 85-1' to 85-3' and the contacts 80-1' and 80-3' first become conduction. Next, the second column of contacts 80-4' to 80-6' respectively short in a stroke come in contact with the contacts 85-4' and 85-6' and conduction is acquired, so that the similar action and effect to those in the above embodiments are produced.

In the above embodiment, the contacts 80-1 to 80-6 and 85-1 to 85-6 are divided into plural columns and difference in time until conduction is acquired is provided between the columns. However, it is clear that the similar effect may be realized even if the contacts 80-1 to 80-6 and the contacts 85-1 to 85-6 are respectively arranged in one row as shown in FIGS. 23(a) and 23(b), and a board 83 on which the contacts 85-1 to 85-6 are formed is angled as shown in FIGS. 23(c) and 23(d) so that the conducting time becomes different between the contact 80-1 and 85-1 on one side and the contact 80-6 and 85-6 on the other side. Similarly, if the position of each end of the contacts 80-1 to 80-6 is designed to be differentiated, so that the same function may be achieved.

In the above embodiments, the mode according to which the ink cartridge is mounted on the carriage is described as an example. However, it is apparent that a similar effect may be obtained even if the present invention is applied to a printing apparatus of a type in which an ink cartridge is housed in a cartridge housing area of the apparatus body and is connected to a print head via an ink supply tube.

That is, contacts have only to be formed in required positions on the exposed face of the ink cartridge and the above contacts 85-1 to 85-6 have only to be formed in touchable positions opposite to the contacts of the ink cartridge when the ink cartridge is installed.

(RX-7 at 10:9-51 (emphasis added).) Thus, the embodiment shown in Figures 21 and 22 has the "contacts" at the bottom of the ink cartridge. Also, the embodiment shown in Figures 23(a) and 23(b) has the "contacts" in a single row. As stated, supra, the specification states that "the first

column of contacts 85-1' to 85-3' [not shown in Figure 22] and the contacts 80-1' and 80-3' first become conduction," then "the second column of contacts 80-4' to 80-6' respectively short in a stroke come in contact with [touches] the contacts 85-4' and 85-6' [not shown in Figure 22] and conduction is acquired." Further, as stated supra, the specification states that "contacts have only to be formed in required positions on the exposed face of the ink cartridge" and thus the contacts need "only to be formed in touchable positions opposite to the contacts of the ink cartridge when the ink cartridge is installed." Significantly, irrespective of the location or arrangement of these contacts, the administrative law judge finds that these "contacts" are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted.

For the foregoing reasons, the administrative law judge finds that all of the various embodiments, in describing the environment in which the cartridge is to operate, show "contacts" on the printer cartridge have one thing in common, viz., "contacts" are for connecting the semiconductor storage device to the printer, or for a similar function, i.e., allowing electrical communication between the semiconductor storage device and the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted. Significantly, active respondents' expert Perry testified that the '917 and '902 patents relate "to where they located the contacts and how those contacts interacted with the print mechanism." (Perry, Tr. at 1633:17-22.) For the foregoing reasons, the administrative law judge further finds that the specification of the '917 patent discloses, not just one type, but various types of "contacts," including, inter alia, the

type shown in Figures 7(a) - (e), the type shown in Figures 18(a) and (b), and the "elastically transformable" spring type shown in Figures 16, 17 and 19 (on the carriage of the printer).

Based on the foregoing, the administrative law judge interprets "contacts" as the portions of conductive material on the printer cartridge that touch the portions of conductive material on the printer when said cartridge is mounted.

The active respondents, relying on their expert Perry, argued that "contacts" should be interpreted as electrically and physically discrete contacts or electrode of the type designated by reference numeral 60 in for example, Figure 7(a) of the '917 patent, i.e., the "contacts" must constitute the entirety of conductive material found on the memory device. Perry explained that by "electrically and physically discrete" means that the contact "communicates with just one individual channel. It - it's not jumpered or connected to any other." (CFF V.C.193 (undisputed by respondents).) However, Figure 20(a)[52] distinguishes "contacts 85-1 to 85-5" from "conductive patterns 86 and 87":

> FIG. 20(a) shows the other embodiment of contacts 85-1 to 85-5 formed in an ink cartridge 40. Conductive patterns 86 and 87 are formed between a column of contacts 85-1 to 85-3 by which conduction is first acquired when the ink cartridge 40 is inserted and a column of contacts 85-4 to 85-5 by which conduction is afterward acquired.

(CX-7 at 9:54-59 (emphasis added).) Further, Perry agreed, during his deposition, that Figure 20(a) and col. 9, lines 54 through 57 of the '917 specification taught that not all of the conductive material on the circuit board, such as references 86 and 87, is the "contact." Thus, Perry testified

---

[52] The specification states: "FIG. 20(a) is a plan showing the other embodiment of the contact mounted on the above ink cartridge and FIG. 20(b) shows a state in which ink adheres." (CX-7 at 2:65-7.)

during his deposition:

> Q. Can we please put up page 371, lines 18 to 22 of the witness' deposition. And this is with respect to figure 20, you were being examined specifically with respect to the items designated as 86 and 87. The question was: "And so the '917 patent specifically does not treat the entirety of the conductive material on the IC -- integrated circuit as part of the contact. Correct? "Answer: In this specific example, that's correct." Do you recall that?
>
> A. I don't, but it is in front of me.
>
> Q. So do you agree that at least at the time of your deposition, you were willing to agree that items 86 and 87 were not part of the contacts?
>
> A. I might have been confused at the time, but I always contended that a contact is electrically -- electrically and physically discrete.
>
> * * *
>
> The question is: "Okay. And so the answer to my question is yes, figure 20 shows an intent on the part of the patentees that not all of the conductive material on the face of the printed circuit board be considered contact. Correct?"
>
> An objection.
>
> "Answer: The conductive patterns, conductive being an adjective there, does lead you to the point that you're making, that these two areas are conductive but yet not part of the contacts."

(Tr. at 2180:5-2181:1, 2183:17-2184:9 (emphasis added).) Furthermore, Perry's proposed additional limiting phrase "electrically and physically discrete" is nowhere to be found anywhere in the claims, the specification, or the prosecution history of the '917 and '902 patents.

Moreover, the administrative law judge has found, supra, that the specification of the

'917 patent discloses, not just one type, but many different types of "contacts," including, inter alia, the type shown in Figures 7(a) - (e), the type shown in Figures 18(a) and (b), and the "elastically transformable" spring type (on the carriage of the printer) shown in Figures 16, 17 and 19.

The active respondents further argued that:

> Likewise, the prosecution history makes clear that the contacts are the structures identified by reference number 60 [emphasis added]. Epson argued, for example, that claims were amended to recite "contacts lie in a plane parallel to the centerline of the ink supply port . . . For example, as shown in Fig. 10, the substrate 31 (on which **contacts 60 shown in Fig. 7** [emphasis added by respondents] are located) is separated from the ink supply port 44 and has contacts lying on the ink supply port's centerline." CX-25 at EPS 0147291 ('458 Application, February 27, 2002, Amendment and Supplemental Information Disclosure Statement, p.8).

(RRCFF V.C.176.) The pertinent portion of the cited Amendment reads:

> Also, claim 23 [asserted claim 1 of the '917 patent] has been amended to recite that the contacts lie in a plane parallel to the centerline of the ink supply port.
>
> * * *
>
> From the revised claim wording it will be appreciated that the storage device or contacts need not actually lie on the centerline of the ink supply port where that centerline passes through the supply port (this would be inside the supply port, which would not be practical), but rather, need only be spaced in the specified manner relative to that centerline. For example, as shown in Fig. 10, the substrate 31 (on which contacts 60 shown in Fig. 7 are located) is separated from the ink supply port 44 and has contacts lying on the ink supply port's centerline.

(CX-25 at EPS 0147291 ('458 Application, February 27, 2002, Amendment and Supplemental Information Disclosure Statement, p.8) (emphasis added).) First, the issue in the portion of the

Amendment, supra, was not the meaning of the term "contacts," but rather, the location of the storage device or contacts, applicants clarifying that "the storage device or contacts need not actually lie on the centerline of the ink supply port" but "need only be spaced in the specified manner relative to that centerline," as shown in Figure 10. Moreover, the applicants' discussion of the embodiment in Figure 10 is clearly presented as an "example." As indicated supra, what is clear is that throughout the specification of the '917 patent, not just one type of "contacts" (as shown in Figure 7) is disclosed, but many types of "contacts" are disclosed and that all said disclosed "contacts" on the printer cartridge, are for connecting the semiconductor storage device to the printer, where said contacts are the portions of conductive material on the printer cartridge that touch the conductive material on the printer when said cartridge is mounted. Hence, the administrative law judge fails to see how the prosecution history cited above by the active respondents "makes clear that the contacts are the structures identified by reference number 60" insofar as respondents are arguing that "contacts" are limited to "the structures identified by reference number 60." Thus, the administrative law judge rejects the active respondents' argument that "contacts" should be limited to the electrodes of the type designated by reference numeral 60 in, for example, Figure 7(a) of the '917 patent.

The staff argued that complainants' proposed construction is incorrect because it relies on the printer to help define the physical structure of the "contacts" on the ink cartridge, whereas claim limitations concerning a printer are absent from the claim. It is argued that while complainants' expert Murch opined that it was necessary to have the printer present to define where the "contacts" are located, the asserted claims have no such requirement. However, as indicated supra, the administrative law judge already found that the plain language of each of the

preambles of the asserted claims 1 and 9 of the '917 patent and asserted claims 1, 31 and 34 of the '902 patent and the specification show that each of said claims, in describing the environment in which the claimed cartridges is to operate, is directed to an ink cartridge which is mounted on a carriage of "an inkjet printing apparatus," i.e., an inkjet printer.

b. "a first overhang disposed between the first upper corner and the second upper corner" and "at least a first overhang member extending beyond a plane of the wall of said housing where said contacts are disposed, the first overhang member being located between the first upper corner and the second upper corner"

In issue are the claimed phrases supra which are found in the fifth clauses of claims 1 and 31 of the '902 patent. (CX-8.) Complainants argued that the term "first overhang" in said phrases has a plain and ordinary meaning and a proper construction is "a structure that projects over"; that this proposal is fully consistent with and supported by the specification, prosecution history, and several dictionary definitions; that the active respondents' expert Perry has proposed a construction, "one or more projections that protrude in a direction substantially perpendicular to the plane of the contacts," that departs from the plain meaning by importing a limitation (a perpendicular orientation) from the specification; that Perry admits that a perpendicular orientation was a preference described in the specification, but not a limitation of the claim; and that Perry's construction is based on his erroneous assumption that in order to constitute an "overhang" the protruding structure must perform all of the functions of the overhang described in the '902 patent. (CBr at 47-48.)

Complainants further argued that the phrase "between the first upper corner and the second upper corner" in the phrases in dispute is used to describe the location of the "overhang" on the second wall of the ink cartridge in claims 1 and 31 of the '902 patent; that a corner is "the

position at which two lines, surfaces or edges meet and form an angle"; that applying this understanding to the container described by the asserted claims, complainants' expert Murch believes the second wall forms four corners, one each where it meets the top wall, bottom wall, and the two side walls; that the claims, however, refer to the two "upper corners," or in other words, the upper portions of the corners formed by the second wall and the two side walls; that the area between these upper corners is, therefore, the upper part of the second wall; and that in accordance with this understanding, complainants' proposed construction of the term "between the first upper corner and the second upper corner" is "in the upper part of the second wall." (CBr at 48.) It is argued that this construction is fully consistent with, and supported by, the specification of the '902 patent; and that complainants' proposed construction of "between the first upper corner and second upper corner" is also supported by the prosecution history of the '917 patent, the parent of the '902 patent, in which the patentees described the overhangs as being in the "upper front" of the cartridge. (Id. at 49.)

The active respondents argued in their response to complainants' proposed finding CFF V.C.205:

> the applicants made clear that the overhang and its location were as depicted by overhangs 46 and 56 as shown in Figs. 4 and 6 of the patent. NRFOF 10.153 - 10.155. Mr. Perry testified that the "overhang" must be understood in the context of the specification of the '902 patent to mean an overhang of the type shown, for example in Figs. 6(a) and 6(b) of the '902 patent. NRFOF 15.62. This construction is correct and fully supported by the intrinsic record. NRFOF 10.153 - 10.161, 10.163, 10.165, 10.168 - 10.171.

It is argued that the intrinsic record, particularly the prosecution history of the '917 and '902 patents, confirms that, when interpreting overhang or overhang member, one of ordinary skill in

the art should look to items 46 and 56 on FIGS. 6(a) and 6(b), respectively (citing CX-25, at EPS 0147292 (February 27, 2002, Amendment at page 9)). (RBr at 90-91.)

The active respondents further argued that as Perry correctly testified, and complainants' expert Murch agreed, the function of the overhang is twofold: (1) to assist with insertion and removal of the ink cartridge, as shown, for example, in FIG. 8, of the '902 patent, and (2) to protect the circuit board 31 and semiconductor storage means 61; that Murch, on the other hand, testified that the claim language merely requires that the overhang be located anywhere on the top half of the second wall; and that in applying his definition of overhang against the accused products, Murch disregards one or both of the functions of the overhang, in support of his infringement allegations. (Id.)

The active respondents also argued in their response to complainants' proposed finding CFF V.C.213:

> Ninestar's construction of "first upper corner and second upper corner" is found, inter alia, in CFOF 15.46, 20.112, and 20.113.[53]

NRFOF 15.46, cited incorrectly by the active respondents as CFOF 15.46, states:

> Mr. Perry testified that the "first upper corner" and "second upper corner" of the asserted claims of the '902 patent are corners of the second wall having at least two electrical contacts. Claim 1 of the '902 Patent, when properly interpreted requires first and second upper corners found on the face or plane of the second wall (like the plane of a sheet of paper) that mounts the electrical contacts. Perry, Tr. p. 1788, lines 19 to p. 1790, line 5.

NRFOF 20.112, cited incorrectly by the active respondents as CFOF 20.112, states:

> The "first upper corner" and "second upper corner" of the asserted claims of the '902 patent are corners of the second wall having at

---

[53] CFOF should be NRFOF.

least two electrical contacts.

NRFOF 20.113, cited incorrectly by the active respondents as CFOF 20.113, states:

> When properly interpreted the asserted claims of the '902 Patent first and second upper corners found on the face or plane of the second wall (like the plane of a sheet of paper) that mounts the electrical contacts.

The staff argued that it is unaware of any reason an overhang would need to be defined as extending in a perpendicular direction. (SBr at 40.) The staff also argued that the first upper corner and second upper corner are regions near the corner points; that however, the overhang can be located anywhere on the second wall; that the language of the claims does not require that the "overhang" lie on a line connecting the two upper corners, but instead merely requires the overhang to be "between" the two upper corners; that in contrast, the claims do require a "line connecting" the two upper corners for purposes of determining the contacts' row location ("closer to a line connecting the first and second upper corner"); and that the claims do not repeat the "line connecting" language when describing the overhang's location and thus there is a distinction in the use of the terms "line connecting" and "between." (SBr at 36-7.)

The staff further argued that dependent claim 39 claims an overhang "at an upper position of said contacts"; that the independent claim 31 contains no limitation on where the contacts are located; and that thus, when the dependent claim requires an overhang at the upper position of the contacts, the overhang, as with the contacts themselves, may be anywhere on the second wall. (SBr at 37-8.)

In issue is (1) whether the claimed phrase "overhang" should be limited to the elements 46 and 56 of Figures 6(a) and 6(b) of the '902 patent; (2) whether the upper corners in issue are

on the face or plane of the second wall; and (3) whether the term "between" should be construed such that an overhang can be located anywhere on the second wall.

At the outset, all parties agreed that the term "overhang" as used in claim 1 of the '902 patent has the same meaning as it is used in claim 31 of the '902 patent. (CFF V.C.199 (undisputed).) All parties also agreed that said claims 1 and 31 both require that the overhang be located on the second wall of the ink cartridge. (CFF V.C.201 (undisputed).)[54] Looking at the plain language of each of the claimed phrases in issue that contain "overhang" and "overhang member," said phrases show where the "overhang" is located. It does not indicate to a person of ordinary skill in the art the meaning of "overhang."

Referring to the specification of the '902 patent, the administrative law judge finds that the written disclosures and the figures in said specification of the '902 patent provide examples of "overhangs." Thus, describing Figure 3,[55] the specification of the '902 patent referring to overhangs 46 and 56 states:

> The levers 11 and 12 respectively extend from the vicinity of the shafts 9 and 10 so that projections 14 and 15 respectively fitted to overhangs 46 and 56 described later at the upper end of the ink cartridges 40 and 50 are approximately perpendicular to each body of the respective levers 11 and 12, and hook portions 18 and 19 elastically fitted to hooks 16 and 17 formed in the sloped part 13b of the holder 4 are respectively formed.

(CX-8 at 3:36-44 (emphasis added).) The administrative law judge, however, finds that the

---

[54] The parties made no distinction between the claimed phrases "overhang" and "overhang member" and the administrative law judge finds none. Thus, the administrative law judge's analysis of the claimed phrase "overhang" and the claimed phrase "overhang member" is identical.

[55] The specification states: "FIG. 3 shows an embodiment of the carriage in the above printing apparatus in a state in which an ink cartridge is installed." (CX-8 at 2:19-21.)

specification of the '902 patent discloses additional "overhangs 45c, 45d, 55c and 55d." Thus, the specification states:

> FIGS. 6(a) and 6(b) show an embodiment of the black ink cartridge 40 and the color ink cartridge 50, a porous member 42 impregnated with ink is respectively housed in containers 41 and 51 formed so that they are substantially rectangular parallelopiped and the respective upper faces are respectively sealed by the covers 43 and 53.
>
> The ink supply ports 44 and 54 are respectively formed in positions opposite to the ink supply needles 6 and 7 when the ink cartridges are respectively installed in the holder 4 at the bottom of the respective containers 41 and 51, and overhang portions 46, 56 and 56 for fitting in the respective projections 14 and 15 of the levers 11 and 12 are integrated with the respective upper ends of the vertical walls 45 and 55 on the side of the ink supply ports. As shown in FIGS. 6(a) and 6(b), the overhang portions 46, 56 protrude from the housing of the ink cartridges 40, 50, respectively, in a direction perpendicular to a plane of the circuit board 31. The overhang portion 46 of the black ink cartridge 40 is continuously formed from one end to the other end, the overhang portion 56 of the color ink cartridge 50 are individually formed so that they are located on both sides and, further, triangular ribs 47 and 57 are respectively formed between each lower surface and the wall 45 or 55. A reference number 59 denotes a concave portion for preventing wrong insertion.
>
> * * *
>
> On the circuit board 31 on which the semiconductor storage means 61 is mounted as described above, at least one through hole 31a and a concave portion 31b are formed, and projections 45a, 45b, 55a and 55b for positioning together with the through hole 31a and the concave portion 31b and overhangs 45c,45d, 55c and 55d which are elastically in contact with the side of the circuit board 31 such as a rib and a pawl are respectively formed near the ink supply ports 44 and 45 in a direction in which the cartridge is inserted in the vertical direction of the circuit board 31 on the vertical walls 45 and 55 which are respectively the mounting faces of the ink cartridges 40 and 50. In another arrangement, if desired, the circuit board 31 may be provided with a t least one projection

> which engages with a concave portion or through-hole for positioning the circuit board 31 with respect to the ink cartridge.
>
> Hereby, the circuit board can be readily installed, respectively fitting to the nibs 45c, 45d, 55c and 55d by pressing the semiconductor storage means 61 on the respective walls 45 and 55 of the cartridges 40 and 50, regulating the position of the semiconductor storage means according to the projection. Hereby, the cartridge is not required to be thickened uselessly for forming a hole for a screw, filling ink of sufficient quantity is enabled, not screwing fastening in which work is relatively troublesome but not riveting in which work is easy can be applied and a manufacturing process can be simplified. The height of the ribs 45c, 45d, 55c and 55d may preferably be higher than a plane of the circuit board 31 when the circuit board is disposed on the ink cartridge, so that the circuit board 31 my [sic] be prevented from touching user's finger when he or she mounts the ink cartridge on the printing apparatus.
>
> In this embodiment, when the cartridge 40 is installed with the lever fit lifted up to an approximately vertical position, the overhang 46 formed on the side of the ink supply port is caught by the projection 14 of the lever 11, the side of the other end is supported by the sloped part 13b of the holder 4 and held in a state in which the side of the ink supply port is lifted as shown in FIG. 8. In the above installation, if the ink cartridge 40 comes in abutment against the body of the printing apparatus, the circuit board 31 is protected by the overhang portion 46 in the upper part, as the circuit board 31 is also housed in the concave portion 48, no shock directly operates on the circuit board 31 and damage is prevented.

(CX-8 at 4:31-54, 5:61-6:38 (emphasis added).) Hence, Figures 6(a) and 6(b) of the '902 patent do show that "the overhang portions 46, 56 protrude from the housing of the ink cartridges 40, 50." As for the purpose of the "overhangs" 46 and 56, the specification discloses that said overhangs are engaged with "the respective projections 14 and 15 of the levers 11 and 12," showing that these "overhangs" are structures which assist in the installation and removal of the

ink cartridge. (See, Murch, Tr. at 1425:4-22.)[56] Further regarding the purpose of the "overhangs" 46 and 56, the specification discloses that "if the ink cartridge 40 comes in abutment against the body of the printing apparatus, the circuit board 31 is protected by the overhang portion 46 in the upper part, as the circuit board 31 is also housed in the concave portion 48, no shock directly operates on the circuit board 31 and damage is prevented." Thus, after the ink cartridge is installed in the printer, the overhang portion 46 helps to protect the circuit board 31. As for the purpose of said additional "overhangs" 45c, 45d, 55c and 55d,[57] the specification teaches that "[t]he height of the ribs 45c, 45d, 55c and 55d may preferably be higher than a plane of the circuit board 31 when the circuit board is disposed on the ink cartridge, so that the circuit board 31 my [sic] be prevented from touching user's finger when he or she mounts the ink cartridge on the printing apparatus," showing that these "overhangs" are for protecting the circuit board 31

---

[56] With respect to the removal of the ink cartridge, which is similar to the installation but in the reverse process, the specification shows that overhang 46 assists in the removal process by engaging with the projection 14 of the lever 11:

> When fitting to the hook 16 is released and the lever 11 is turned upward in case ink in the ink cartridge 40 is consumed, the projection 14 of the lever 11 is fitted to the lower part of the overhang portion 46 of the ink cartridge in the process as shown in FIG. 9. When the lever 11 is further turned in this state, the ink cartridge 40 is lifted by the lever 11 and fitting to the ink supply needle 6 is released. As the upper half of the ink cartridge 40 is exposed from the holder with the overhang 46 on the side of the ink supply port supported by the projection 14 of the lever 11 as shown in FIG. 8 when the turn of the lever 11 up to an approximately vertical position is finished, the ink cartridge can be easily extracted.

(CX-8 at 7:52-64 (emphasis added).)

[57] Overhangs 45c, 45d, 55c and 55d are also referred to as "nibs" or "ribs."

from accidental touching when the ink cartridge is mounted on the printer. Additionally, Figures 6(a) and 6(b) show that the "overhangs" 45c, 45d, 55c and 55d are structures which are immediately above and below the circuit board 31 and thus said overhangs have nothing to do with installing or removing the ink cartridge. Significantly, the administrative law judge finds nothing in the specification which limits the claimed "overhang" to the elements 46 and 56 of Figures 6(a) and 6(b). Figures 6(a) and 6(b), and the specification, supra, show that "triangular ribs 47 and 57 are respectively formed between each lower surface and the wall 45 or 55." Importantly, however, the administrative law judge finds nothing in said specification or said figures that requires that the placement of the overhang be determined by a "maximization of triangulation."

As to the prosecution history regarding the claimed phrase "overhang," certain statements were made by the applicants in overcoming an indefiniteness rejection in the Amendment and Supplemental Information Disclosure Statement filed on February 27, 2002. (CX- 25 at EPS 0147284 - 0147304.) The relevant portions of said Amendment states:

> Claims 1 - 65 and 96 - 124 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of Applicant's invention. In particular, it was said to be unclear how the overhang member could be disposed between the first and second upper corners of the housing.
>
> * * *
>
> As regards the remaining claims, and for the reasons given during the personal interview, the overhang aspect of the present invention would be clear to those skilled in the art in view of Figs. 3, 4, and 6 and the description of those drawings, taken along with the general knowledge that would be possessed of those of such skill. For example, Figs.4 and 6 depict both overhang portion 46, which is

> located between the corners (upper front) of cartridge 40, and overhang portions 56, each of which is located between the corners (upper front) of the cartridge 50.

(CX-25 at 9 (EPS 0147292) (emphasis added).) The cited portions of the Amendment refer to the preferred embodiments 46 and 56 to clarify the location of the overhangs to overcome the indefiniteness rejection because "it was said to be unclear how the overhang member could be disposed between the first and second upper corners of the housing." Thus, the issue before the Examiner was the location of the overhangs and not the structure of the overhangs. Importantly, the administrative law judge finds that applicants' use of the phrase "[f]or example" shows that elements 46 and 56 are exemplary in nature and do not redefine "overhang" as limited to the overhang structures of elements 46 and 56. As to this point, the active respondents' expert Perry agreed, testifying that the "inventors offered this documentation to help clarify that these figures would - would complete the understanding of what the upper corners in the overhang were." (Perry, Tr. at 1801:14-18.)

Based on the foregoing, the administrative law judge interprets the claimed term "overhang" as a protruding structure which is not limited to a perpendicular orientation and which includes each of the elements 46, 56, 45c, 45d, 55c and 55d and which structure helps protect circuit board 31.

The active respondents argued that the function of the overhang is twofold: (1) to assist with insertion and removal of the ink cartridge, as shown, for example, in FIG. 8, of the '902 patent, and (2) to protect the circuit board 31 and semiconductor storage means 61; that Murch, on the other hand, argued for an interpretation that vitiates the requirement of upper corners, and instead argues that the claim language merely requires that the overhang be located anywhere on

the top half of the second wall; and that in applying his definition of overhang against the accused products, Murch disregards one or both of the functions of the overhang, in support of his infringement allegations. (RBr at 90-91.) However, the administrative law judge already found supra, that the specification of the '902 patent shows that the purpose of the "overhangs" 45c, 45d, 55c and 55d, similar to the "overhangs" 46 and 56, is for protecting the circuit board 31, and that the "overhangs" 45c, 45d, 55c and 55d are structures which are immediately above and below the circuit board 31 and thus said overhangs have nothing to do with installing or removing the ink cartridge. Also, respondents argued that the placement of the overhang must "maximize triangulation." (Active respondents' responses to CFF V.C.208, 209.) However, the administrative law judge found supra, that nothing in said specification or said figures that requires that the placement of the overhang be determined by a "maximization of triangulation."

Moreover, the active respondents' interpretation of "overhang" is based on their erroneous assumption that in order to constitute an "overhang," the structure must perform all of the functions of the overhangs described in the '902 patent. As Phillips held:

> The fact that the written description of the '798 patent sets forth multiple objectives to be served by the baffles recited in the claims confirms that the term "baffles" should not be read restrictively to require that the baffles in each case serve all of the recited functions. We have held that "[t]he fact that a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives." Liebel-Flarsheim, 358 F.3d at 908; see also Resonate Inc. v. Alteon Websystems, Inc., 338 F.3d 1360, 1367 (Fed.Cir.2003). Although deflecting projectiles is one of the advantages of the baffles of the '798 patent, the patent does not require that the inward extending structures always be capable of performing that function.

(Phillips, 415 F.3d at 1326-27 (emphasis added).)

Referring to whether the upper corners in issue are on the face or plane of the second wall and whether the term "between" should be construed such that an overhang can be located anywhere on the second wall, the antecedent for the claimed phrase "the first upper corner and the second upper corner" in each of the claims 1 and 31 is "the second wall having both a first upper corner and a second upper corner." (CX-8, 11:26-28, 13:23-25 (emphasis added).) Hence, the plain language of each of said asserted claims shows that the first upper corner and the second upper corner are the upper corners of the second wall.

Further, asserted claim 1 of the '902 patent includes a claimed phrase "a line connecting the first and the second upper corner" in addition to the claimed phrase "between the first upper corner and the second upper corner" in issue. Thus the administrative law judge finds a distinction in the use of the terms "line connecting" and "between," with said distinction supporting a finding that "between the first upper corner and the second upper corner" would encompassing an area broader or larger than "a line connecting the first and the second upper corner."

The term "corner" is not found anywhere in the specification of the '902 patent other than in the asserted independent claims 1 and 31, and non-asserted dependent claims 24 and 25 (both of which depend on asserted claim 1) and non-asserted dependent claims 43 and 47 (both of which depend on asserted claim 31). However, referring to the specification of the '902 patent, the administrative law judge finds that the written disclosures and the figures in said specification provide examples of the locations of the "overhangs." Thus, describing Figure 3,[58] the

---

[58] The specification states: "FIG. 3 shows an embodiment of the carriage in the above printing apparatus in a state in which an ink cartridge is installed." (CX-8 at 2:19-21.)

specification of the '902 patent states:

> The levers 11 and 12 respectively extend from the vicinity of the shafts 9 and 10 so that projections 14 and 15 respectively fitted to overhangs 46 and 56 described later at the upper end of the ink cartridges 40 and 50 are approximately perpendicular to each body of the respective levers 11 and 12, and hook portions 18 and 19 elastically fitted to hooks 16 and 17 formed in the sloped part 13b of the holder 4 are respectively formed.

(CX-8 at 3:36-44 (emphasis added).) Referring to exemplary "overhangs 46 and 56" of which overhang 46 is shown in Figure 3, the administrative law judge finds that said overhangs 46 and 56 are located "at the upper end of the ink cartridges 40 and 50," of which cartridge 40 is shown in Figure 3. Similarly, the administrative law judge finds that the portions of the specification of the '902 patent describing the two embodiments shown in Figures 6(a) and 6(b), also show that the exemplary "overhangs" 46 and 56 are "integrated with the respective upper ends of the vertical walls 45 and 55," of the ink cartridges 40 and 50, respectively. Thus, describing Figures 6(a) and 6(b), the specification of the '902 patent states:

> FIGS. 6(a) and 6(b) show an embodiment of the black ink cartridge 40 and the color ink cartridge 50, a porous member 42 impregnated with ink is respectively housed in containers 41 and 51 formed so that they are substantially rectangular parallelopiped and the respective upper faces are respectively sealed by the covers 43 and 53.
>
> The ink supply ports 44 and 54 are respectively formed in positions opposite to the ink supply needles 6 and 7 when the ink cartridges are respectively installed in the holder 4 at the bottom of the respective containers 41 and 51, and overhang portions 46, 56 and 56 for fitting in the respective projections 14 and 15 of the levers 11 and 12 are integrated with the respective upper ends of the vertical walls 45 and 55 on the side of the ink supply ports.

(CX-8 at 4:31-44 (emphasis added).) Moreover, describing Figure 8, the specification of the

'902 patent further states:

> In this embodiment, when the cartridge 40 is installed with the lever fit lifted up to an approximately vertical position, the overhang 46 formed on the side of the ink supply port is caught by the projection 14 of the lever 11, the side of the other end is supported by the sloped part 13b of the holder 4 and held in a state in which the side of the ink supply port is lifted as shown in FIG. 8. In the above installation, if the ink cartridge 40 comes in abutment against the body of the printing apparatus, the circuit board 31 is protected by the overhang portion 46 in the upper part, as the circuit board 31 is also housed in the concave portion 48, no shock directly operates on the circuit board 31 and damage is prevented.

(CX-8 at 6:26-38 (emphasis added).) The specification above discloses that "the circuit board 31 is protected by the overhang portion 46 in the upper part." Thus, the administrative law judge finds that after the ink cartridge is installed in the printer, the exemplary "overhang" portion 46 which is located in "the upper part" of the second wall, helps to protect the circuit board 31. (See Murch, Tr. at 917:23-918:16, 919:21-920:8.)

Based on the portions of the specification of the '902 patent, supra, describing the embodiments shown in Figures 3, 6(a), 6(b) and 8, the administrative law judge finds that the exemplary "overhangs" 46 and 56 are located at the upper parts of the second wall.

As to the prosecution history regarding the claimed phrase "between the first upper corner and the second upper corner" in issue, as indicated, certain statements were made by the applicants in overcoming an indefiniteness rejection in the Amendment and Supplemental Information Disclosure Statement filed on February 27, 2002. (CX- 25 at EPS 0147284 - 0147304). Also as found supra, the issue before the Examiner was the location of the overhangs and not the structure of the overhangs. The administrative law judge finds that the cited portions supra of the Amendment make clear that exemplary "overhang portion 46" is "located between

the corners (upper front) of cartridge 40" and each of the two "overhang portions 56" is "located between the corners (upper front) of the cartridge 50."

Further, as indicated supra, asserted claim 1 includes a claimed phrase "a line connecting the first and the second upper corner" in addition to the claimed phrase "between the first upper corner and the second upper corner" in issue. The administrative law judge already found supra, that that distinction supports a finding that "between the first upper corner and the second upper corner" would encompass an area broader or larger than "a line connecting the first and the second upper corner." Hence, said distinction further supports the specification of the '902 patent's disclosure and the prosecution history which shows that exemplary "overhangs" 46 and 56 are located at the upper parts of the second wall.

For the foregoing reasons, and in view of the plain language of the asserted claims, the specification and the prosecution history, the administrative law judge finds that (1) the upper corners in issue are on the face or plane of the second wall; and (2) the term "between" should be construed such that an overhang should be located in the upper part of the second wall.

c. "a plurality of external walls, including a first wall and a second wall, defining at least some of a chamber" and "a plurality of external walls defining at least some of a chamber"

In issue is the claimed term "chamber," which is found in each of the first clauses, supra of independent claims 1 and 9 of the '917 patent. (CX-7 at 11:35-36, 12:14-15.)

Complainants argued that their expert Murch testified that "chamber" means a structure "in which the ink is actually contained in some form"; that consistent with that interpretation, Webster's New World College Dictionary (3rd Ed.) defines "chamber" as "any enclosed space; compartment"; and that the term "chamber" should be construed simply as an "enclosed space."

(CRBr at 18, 20.)

The active respondents argued that their expert Perry has interpreted chamber, in the context of those asserted claims of the '917 patent, and the intrinsic record of the '917 patent, as describing the ink supply tank that is constructed of external walls that holds the volume of ink that is supplied to the printing mechanism through the ink supply needle in ink jet printers; and that Perry supports his understanding of the term "chamber" as used in the asserted claims of the '917 patent with the specification of the '917 patent that shows in every embodiment a unitary tank structure of the type shown, for example, in FIG. 3. (RBr at 85-86.)

The staff did not offer a claim interpretation for the claimed term "chamber" in any of its post-hearing submissions.

In issue is whether the claimed term "chamber" should be interpreted so that the entirety of the chamber structure is "constructed of external walls that holds the volume of ink" or whether said phrase allows some of the "chamber" structure to be constructed of non-external walls.

The claimed term "chamber" appears as a part of the first clause of asserted independent claim 1 of the '917 patent, viz., "a plurality of external walls, including a first wall and a second wall, defining at least some of a chamber" and in the first clause of asserted independent claim 9 of the '917 patent, viz., "a plurality of external walls defining at least some of a chamber." (CX-7 at 11:35-36, 12:14-15 (emphasis added).) Hence, the plain language of each of said asserted claims shows that the external walls define "at least some of a chamber" but not the entirety of the chamber. Thus, the plain language shows that other walls, which may or may not be external, also define the claimed "chamber."

The terms "chamber" or "chambers" are found in the specification of the '917 patent (in addition to the asserted independent claims 1 and 9) only three times. Thus, describing Figure 6(b), the specification of the '917 patent states:

> FIGS. 6(a) and 6(b) show an embodiment of the black ink cartridge 40 and the color ink cartridge 50, a porous number 42 impregnated with ink is respectively housed in containers 41 and 51 formed so that they are substantially parallelopiped and the respective upper faces are respectively sealed by the covers 43 and 53.
>
> * * *
>
> As best shown in FIGS. 6(a) and 6(b), the circuit boards 31 is attached on a side wall having the shorter width than the other side wall of the ink cartridges 40 and 50 and located on a central line of the ink supply ports 44 and 54, respectively. The circuit board 31 is disposed substantially in parallel with the side wall. In addition, as shown in FIG. 6(b), the ink cartridge 50 is provided with a plurality of ink chambers for different ink, and the circuit board 31 is disposed substantially at a center of the total width of the plurality of the ink chambers. Because the circuit boards 31 are located as described above, the accurate positional relationship of the circuit boards 31 with the contact member of the printing apparatus can be assured when the ink cartridges 40 and 50 are mounted on the printing apparatus.

(CX-7 at 4:40-45, 5:3-16 (emphasis added).) Further, describing Figures 18(a), (b) and (c), the specification of the '917 patent states:

> Through holes 83a and 83b for a positioning are formed on the circuit board 83 as shown in FIG. 18(a), semiconductor storage means 84 is mounted on the surface on the side of an ink housing chamber, that is, at the back as shown in FIGS. 18(b) and 18(c) and contacts 85-1, 85-2, . . . 85-6 connected to the data input terminal and the driving power supply terminal of the semiconductor storage means 84 for acquiring conduction to the contacts 80-1 to 80-6 on the side of the carriage, are formed on the side of the exposed surface.

(CX-7 at 8:54-63 (emphasis added).) The administrative law judge finds that the cited portions

of the specification of the '917 patent refer to "ink chambers" twice and "ink housing chamber" once. Thus, the administrative law judge finds that said specification's reference to "ink chambers" and "ink housing chamber" teaches that a "chamber" is a structure which holds or houses ink. The administrative law judge also finds that said specification's reference to "a plurality of ink chambers for different ink" shows that certain embodiments of ink cartridges, such as the color ink cartridge 50 shown in Figure 6(b), have multiple ink "chambers" to accommodate "different ink." The multiple ink chambers can be better seen in each of the Figures 4, 12(b), 13(b) and 14(b) which shows a multiple ink chamber cartridge (color ink cartridge 50) with each ink chamber illustrated by dotted lines. Moreover, consistent with the specification's reference to "a plurality of ink chambers for different ink" for the color ink cartridge 50 shown in Figure 6(b), the administrative law judge finds that five separate ink chambers are illustrated by dotted lines in each of the Figures 4, 12(b), 13(b) and 14(b) for the multiple ink chamber cartridge (color ink cartridge 50). He finds this is so because Figure 4, for example, shows that each of the five separate ink supply ports 54 which supply "different ink" colors are within the boundary of each of the five elongated rectangular areas enclosed within the dotted lines in issue,[59] and the same five ink supply ports 54 shown in Figure 4 are also cited in

---

[59] Describing Figure 4, the specification of the '917 patent states:

> Elastic members 20 and 21 for elastically pressing at least the area opposite to the ink supply port 44 or 54 of each ink cartridge 40 or 50, as shown in FIG. 4, when the ink cartridge 40 is set in a normal position are provided to the back of each lever 11 or 12, that is, the face opposite to a cover 43 of the ink cartridge 40.

(CX-7 at 3:54-59 (emphasis added).)

the specification of the '917 patent describing Figure 6(b).[60] In addition, the administrative law judge finds nothing in the specification of the '917 patent which requires that the entirety of a chamber be constructed of only external walls. Imposing such a requirement would directly contradict the intrinsic evidence, including the language of the claim which states, "a plurality of external walls defining at least some of a chamber" (CX-78 at 11:35-36, 12:14-15 (emphasis added)) and the figures seen, supra. Thus, the administrative law judge finds that the specification of the '917 patent shows that a chamber is a structure which holds ink and that there is no requirement that the entirety of the chamber be constructed of only external walls.

To further analyze the claim term "chamber," the administrative law judge examined the

---

[60] As indicated supra, describing Figures 6(a) and (b), the specification of the '917 patent states:

> As best shown in FIGS. 6(a) and 6(b), the circuit boards 31 is attached on a side wall having the shorter width than the other side wall of the ink cartridges 40 and 50 and located on a central line of the ink supply ports 44 and 54, respectively.
>
> * * *
>
> In addition, as shown in FIG. 6(b), the ink cartridge 50 is provided with a plurality of ink chambers for different ink, and the circuit board 31 is disposed substantially at a center of the total width of the plurality of the ink chambers.

(CX-7 at 5:3-12 (emphasis added).)

three physical exhibits CPX-1097[61], CPX-1109[62], and CPX-1113[63], each of which includes five separate ink chambers, and within the boundary of each of said ink chambers is located an ink supply port like ink supply port 54, seen supra, which may supply "different ink" colors. The administrative law judge has also examined CPX-1114[64], which has a single "chamber." Although claims may not be construed with reference to the accused device (see NeoMagic Corp. v. Trident Microsystems, Inc., 287 F.3d 1062, 1074 (Fed. Cir. 2002)), that rule does not forbid awareness, for example, of the accused product to supply the parameters and scope of the infringement analysis, including its claim construction component. (See Wilson Sporting Goods Company v. Hillerich & Bradsby Co., 442 F.3d 1322, 1330-31 (Fed. Cir. 2000).) Therefore, the administrative law judge has also physically examined CPX-25[65], which has five replaceable, or removable, chambers, and CPX-21[66], which has a single replaceable, or removable, chamber. The administrative law judge has found, supra, that the claim term "chamber" is not limited to only having external walls. Therefore, and also based on his physical examination of the

---

[61] CPX-1097 was identified as Epson Cartridge Model No. IC5CL02. (Complainants' Final Public Exhibit List at 163.)

[62] CPX-1109 was identified as Epson Cartridge Model No. PMIC1C. (Complainants' Final Public Exhibit List at 164.)

[63] CPX-1113 was identified as Epson Cartridge Model No. S020110 / S020193. (Complainants' Final Public Exhibit List at 165.)

[64] CPX-1114 was identified as Epson Cartridge Model No. T017. (Complainants' Final Public Exhibit List at 165.)

[65] CPX-25 was identified as Ninestar Cartridge Model No. NE-0T008-F. (Complainants' Final Public Exhibit List at 68.)

[66] CPX-21 was identified as Ninestar Cartridge Model No. NE-0T007 BK. (Complainants' Final Public Exhibit List at 67.)

cartridges, supra, the administrative law judge finds that even if the ink chambers are removable, when assembled, the whole is an ink cartridge.

The active respondents argued that "chamber" should be interpreted as "describing the ink supply tank that is constructed of external walls." (RBr at 85.) The administrative law judge has found, supra, that the claimed term "chamber" is not limited to only external walls. Thus, the administrative law judge rejects said argument of the active respondents.

Based on the foregoing, the administrative law judge interprets the claimed term "chamber" as a structure which holds ink where at least some of the structure is constructed of external walls while the remaining structure may be constructed of non-external walls.

d. "a housing containing an ink therein and configured for removable mounting on the printhead, said housing having a first wall and a second wall, the second wall having both a first upper corner and a second upper corner"

In issue is the claimed term "housing," which is found in the first clause supra of independent claims 1 and 31 of the '902 patent. (CX-8 at 11:23-27, 13:21-25.)

Complainants argued that their construction of "housing" should be understood as a "case or enclosure", and should be adopted in the asserted claims 1 and 31 of the '902 patent; that the term "housing" refers to the external structure of the cartridge that contains the ink and is configured for removable mounting on the cartridge; that accordingly, complainants' expert Murch testified that he believes that "housing," as used in the '902 patent, may be understood as the ink cartridge itself; that as depicted in the figures of the '902 patent, the "housing" may house one or more tanks or chambers of ink; and that Murch's understanding is also consistent with the dictionary definition of "housing": "a case or enclosure esp. for a machine or part. (CRBr at 20.)

The active respondents argued the following:

> Like the term "chamber," as used in the asserted claims of the '917 patent, Mr. Perry has interpreted "housing" as describing the ink supply tank that is constructed of external walls that holds the volume of ink that is supplied to the printing mechanism through the ink supply needle in ink jet printers.

(RBr at 88, citing NRFOF 15.44.)[67]

The staff did not offer a claim interpretation for the claimed term "housing" in any of its post-hearing submissions.

At issue is whether the claimed term "housing" as recited in claims 1 and 31 of the '902 patent should be interpreted to be identical to the claimed term "chamber" recited in the asserted claims of the '917 patent.[68]

---

[67] The administrative law judge finds that the active respondents' proposed interpretation of "housing" is effectively identical to their proposed interpretation of "chamber" for the claims in issue of the '917 patent, as shown by comparing the following two excerpts:

> Mr. Perry has interpreted chamber, in the context of those asserted claims of the '917 patent, and the intrinsic record of the '917 patent, as describing the ink supply tank that is constructed of external walls that holds the volume of ink that is supplied to the printing mechanism through the ink supply needle in ink jet printers. Perry, Tr. P. 1659, lines. 1-12.

(NRFOF 15.43.) and

> Housing describes the ink supply tank that is constructed of external walls that holds the volume of ink that is supplied to the printing mechanism through the ink supply needle in ink jet printers. Perry Tr. p. 1635 line 18 to p. 1636, line 22, Murch, Tr. p. 472, lines 15-24.

(NRFOF 15.44.)

[68] The administrative law judge interpreted, supra, the claimed term "chamber" as a structure which holds ink where at least some of the structure is constructed of external walls while the remaining structure may be constructed of non-external walls.

At the outset, as seen from the private parties' arguments supra, said parties agreed that a "housing" is some structure that contains ink.

The claimed term "housing" appears as a part of each of the identical first clauses of asserted independent claims 1 and 31 of the '902 patent, viz., "a housing containing an ink therein and configured for removable mounting on the printhead, said housing having a first wall and a second wall, the second wall having both a first upper corner and a second upper corner." (CX-8 at 11:23-27, 13:21-25.) The administrative law judge finds that the plain language of each of said asserted clauses shows that a housing is a structure which contains ink. Furthermore, the plain language of said clauses shows that the housing is configured for removable mounting on the printhead.

Moreover, non-asserted dependent claim 22, which depends on asserted independent claim 1, shows that a housing as recited in claim 1 of the '902 patent may comprise a plurality of chambers for different inks:

> The ink cartridge according to claim 1, wherein said housing comprises a plurality of ink chambers for different ink, and said contacts are disposed substantially at a central area of the total width of said plurality of ink chambers.

(CX-8 at 12:46-49 (emphasis added).) Similarly, non-asserted dependent claim 42, which depends on asserted independent claim 31, also shows that a housing which is recited in claim 1 of the '902 patent may be divided into at least two separate chambers containing ink:

> The ink cartridge according to claim 31, wherein the interior of said housing is divided into at least two separate chambers.

(CX-8 at 14:24-26 (emphasis added).) Thus, based on the plain language of said dependent claims 22 and 42, the administrative law judge finds that a "housing," as used in claims 1 and 31

of the '902 patent, may contain more than one "chamber," and further may contain ink because the chambers contain ink.

With respect to the specification of the '902 patent, the administrative law judge finds that said specification refers to "the housing of the ink cartridges." Thus, describing Figures 6(a) and 6(b), the specification of the '902 patent states:

> The ink supply ports 44 and 54 are respectively formed in positions opposite to the ink supply needles 6 and 7 when the ink cartridges are respectively installed in the holder 4 at the bottom of the respective containers 41 and 51, and overhang portions 46, 56 and 56 for fitting in the respective projections 14 and 15 of the levers 11 and 12 are integrated with the respective upper ends of the vertical walls 45 and 55 on the side of the ink supply ports. As shown in FIGS. 6(a) and 6(b), the overhang portions 46, 56 protrude from the housing of the ink cartridges 40, 50, respectively, in a direction perpendicular to a plane of the circuit board 31. The overhang portion 46 of the black ink cartridge 40 is continuously formed from one end to the other end, the overhang portion 56 of the color ink cartridge 50 are individually formed so that they are located on both sides and, further, triangular ribs 47 and 57 are respectively formed between each lower surface and the wall 45 or 55. A reference number 59 denotes a concave portion for preventing wrong insertion.

(CX-8 at 4:37-54 (emphasis added).) Hence, the administrative law judge finds that the specification's reference to "the housing of the ink cartridges" shows that a "housing" is not identical to an ink cartridge and that the "housing" is a part of the ink cartridge. Further, the language of the third limitation of asserted claim 1 of the '902 patent, as seen, supra, states: "a semiconductor storage device storing information about the ink disposed on said housing." The plain language of said claimed phrase requires that an ink cartridge have a semiconductor storage