UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

IN RE PAPST LICENSING GMBH & CO. KG LITIGATION	**Misc. Action No. 07-493 (RMC)** **MDL Docket No. 1880**

This Document Relates To:
The First Wave Cases --
Fujifilm Corp. v. Papst, 07-cv-1118;
Matsushita Elec. Indus. Co., Ltd. v. Papst, 07-cv-1222;
Papst v. Olympus Corp., 07-cv-2086;
Papst v. Samsung Techwin Co., 07-cv-2088;
Papst v. Ricoh Co. Ltd., 07-cv-612;
Hewlett Packard Co. v. Papst, 08-cv-865; and
Papst v. Nikon Corp., 08-cv-985.

MODIFIED MEMORANDUM OPINION REGARDING CLAIMS CONSTRUCTION

Papst Licensing GMBH & Co. ("Papst") acquired two patents from inventor Michael

Tasler and in this MDL has alleged that digital camera manufacturers that sell products in the United

States have infringed its patents. Pursuant to *Markman v. Westview Instruments, Inc.*, 517 U.S. 370

(1996), the Court is required to construe the contested claims of the patents before a jury can

determine whether the accused products infringe.

I. BACKGROUND

A. Procedural History

Papst alleges that the Camera Manufacturers[1] (also referred to as "CMs") infringe

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[1] This Opinion relates to the First Wave Cases listed in the caption. The Camera Manufacturers who are parties in the First Wave Cases include: Fujifilm Corporation; Fujifilm U.S.A., Inc.; Fujifilm Japan; Matsushita Electric Industrial Co., Ltd.; Victor Company of Japan, Ltd.; Olympus Corporation; Olympus Imaging America Inc.; Samsung Techwin Co.; Samsung Opto-Electronics America, Inc., Panasonic Corporation of North America; JVC Company of America; Ricoh Corporation; Ricoh

two patents: U.S. Patent Nos. 6,470,399 (" '399 Patent") and 6,895,449 (" '449 Patent") (collectively the "Patents"). The Court held a claims construction hearing on September 22 through 24, 2008, with the benefit of extensive briefing and arguments by Papst and the Camera Manufacturers.[2] For purposes of this MDL, Papst is treated as the plaintiff regardless of how any individual lawsuit originated in its home court.

The Court issued its Memorandum Opinion Regarding Claims Construction on June 12, 2009. Papst filed a Request for Clarification and Reconsideration of Part of the Court's Order Regarding Claims Construction on July 13, 2009. *See* Dkt. # 321. This Modified Opinion grants the request for reconsideration. For ease of future review, if any, it contains the full opinion in a single document and the June 12, 2009, Memorandum Opinion and Order [Dkt. ## 312 & 313] will be vacated.

B. Facts

Papst is a German company, whose business is to acquire and enforce intellectual property rights. That is, it acquires patents on products or methods invented by others and then searches the world for products it might challenge for infringement. When faced with such a challenge, the allegedly infringing party chooses whether (1) to enter into a licensing agreement and pay royalties to Papst or (2) to take part in patent infringement litigation, either as a defendant in an

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Company Ltd.; Ricoh Americas Corporation; Hewlett-Packard Company; Nikon Corporation; and Nikon, Inc.

[2] The parties' briefs include: Papst's *Markman* Br. [Dkt. # 173]; CMs' *Markman* Br. [Dkt. # 188]; Papst's Reply [Dkt. # 193]; and CMs' Surreply [Dkt. # 197]; Papst's Mot. for Reconsideration [Dkt. # 321]; CMs' Opp'n [Dkt. # 323]; Papst's Reply to its Mot. for Reconsideration [Dkt. #325]; CMs' Surreply [Dkt. # 328]; and Papst's Resp. to Surreply [Dkt. # 330]. Citations to the transcript of the *Markman* hearing are identified as "Tr. day #:page # (Party)," with days 1, 2, and 3 representing the transcripts of September 22, 23, and 24, 2008, respectively.

infringement suit seeking damages filed by Papst or as a plaintiff in a suit seeking declaratory judgment of non-infringement against Papst. In this case, Papst acquired certain rights to the Patents from the inventor, Michael Tasler. Papst then sought to negotiate license agreements with manufacturers of digital cameras all over the world. When numerous manufacturers who sell digital cameras in the United States refused to enter licensing agreements with Papst, Papst and the manufacturers filed lawsuits against one another and this MDL ensued.

The invention at issue is a "Flexible Interface for Communication Between a Host and an Analog I/O Device Connected to the Interface Regardless of the Type of the I/O Device." '399 Patent, Title; '449 Patent, Title (lower case substituted). "In this title I/O means input/output device," Tr. 1:6 (Papst), but the I/O device is repeatedly referred to as a "data transmit/receive device" in the Patents. *See, e.g.*, '399 Patent, col. 13:1-2 & col. 3:43-44 (stating "regardless of the type of the data transmit/receive device attached"); '449 Patent, col. 11:63-64 & col. 4:6-7 (same). The invention was designed to provide fast data communication between an analog I/O device and a digital computer ("host device") by converting the analog data to digital, formatting it, and transferring the data to the computer without the need for special software; this was accomplished by telling the computer that the invented interface device was an I/O device already known to the computer (and for which the computer already had drivers), regardless of what kind of data transmit/receive device was attached to the interface device. '399 Patent, Abstract; '449 Patent, Abstract. When the computer responded with a data request command, the interface device interpreted the command as a data transfer request and forwarded the digitized data originating from the analog data transmit/receive device. '399 Patent, col. 13:9-13.[3] "It is *the* object of the present

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[3] The '449 Patent Claims contain no similar provision expressing the transfer of data from the data transmit/receive device through the interface device and to the computer. *See* '449 Patent,

invention to provide an interface device for communication between a host device [computer] and a data transmit/receive device whose use is host device-independent and which delivers a high data transfer rate." '449 Patent, col. 3:20-23 (emphasis added); *see* '399 Patent, col. 3:24-27 ("It is an object of the present invention to provide an interface device for communication between a host device and a data transmit/receive device whose use is host device-independent and which delivers a high data transfer rate.").

The '399 Patent was issued on October 22, 2002, with an application date of March 3, 1998; the '449 Patent was issued on May 17, 2005, with an application date of August 15, 2002. As of March 1998, when Mr. Tasler applied for the '399 Patent, "interface devices themselves were known but they had certain problems. . . . [T]o get these prior art interface devices to talk to computers, they required these sophisticated drivers which were prone to malfunction and had poor data transfer rates." Tr. 1:5 (Papst).[4] Another problem with the prior art was that "if you start[ed] installing specific drivers for each piece of hardware that you add[ed] to the computer, these drivers [could] start butting heads with each other . . . [and] [t]he computer crashe[d]." *Id.* 1:6 (Papst). Drivers "are the software programs that are used by the computer[] to communicate with the hardware that's attached to the computer. So for each and every hardware device that you connect to a computer there has to be a driver that allows the computer to communicate with that hardware device. So when you attach[ed] these prior art interface devices, we [had] drivers that caused

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col. 12:1-7 (after the interface device signals that it is a customary storage device, the computer "communicates with the interface device by means of the driver for the storage device customary" in the computer and the interface device simulates a "virtual file system" to the computer); *but see id.*, col. 4:55-61 (the '449 Patent specification mimics the specification for the '399 Patent in describing data transfer).

[4] The Court here provides Papst's explanation of prior art to explain the invention, but the Court is not making any findings concerning the prior art.

problems." Tr. 1:5 (Papst). However, all kinds of computers could "communicate with . . . very common hardware devices such as hard disk drives" and printers. *Id.* 1:7 (Papst). "The present invention is based on the finding that both a high data transfer rate and host device-independent use can be achieved if a driver for an input/output device customary in a host device, normally present in most commercially available host devices, is utilized," instead of special driver software. '399 Patent, col. 4:23-27; *see also* '449 Patent, col. 3:27-30 (same).

> [T]o make his invention flexible [Mr. Tasler sought] to simulate one of these customary devices [such as the hard disk drive already on the computer] and be able to communicate with the computer with the language that it already knew and to in fact configure the data to simulate files and file systems that the computers would expect to see, [making the communication between the device and the computer] faster and more reliable.
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> He also saw that by not writing drivers, specific drivers for his own interface device and instead causing the computer to use the drivers that were supplied by the computer makers that he would achieve a more reliable invention, a more reliable data communication and in fact, the drivers for certain of these devices such as the disk drives were highly optimized for each operating system so they worked very well and transferred data at a very fast rate compared to the drivers for the known interface devices.
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> Also he made it easier to hook one of these up. He put into the interface device the ability to respond to an inquiry from a computer and generate a response that would cause the computer to recognize it as a piece of hardware that [the computer] already knew about and then by doing that [the interface device] allowed the computer to install, recognize and install the interface device without any input from the person who is using the computer [because no special driver was needed].

Tr. 1:7-8 (Papst).

To illustrate the nature of the invention at the claims construction hearing, Papst showed a "prototype board" (an integrated circuit board) and "matched up" the devices on the prototype board "that corresponded with some of the things that are shown" in Figure 2 of each Patent. *Id.* 1:11 (Papst); *see also id* 1:19-20 (Papst). "[T]he circuit board itself was designed by Mr. Tasler," *id.* 1:13 (Papst), meaning that Mr. Tasler himself selected and arranged the configuration and connections between the parts on the circuit board. *Id.* 1:13-14 (Papst). Papst noted calibration relays on the right side of the board, suggesting the inputs, amplifiers, and sample and hold circuits in Figure 2, where the interface device would be connected to the data transmit/receive device. *Id.* 1:11 (Papst). The prototype board also had a digital signal processor, an EEPROM (electrically erasable programable read only memory) chip for non-volatile memory, and volatile random access memory (RAM). *Id.* Volatile memory is no longer retained when the computer is turned off, while non-volatile memory remains. Tr. 3:138 (Papst). In addition, a small computer system interface (SCSI) chip was on the prototype board where the interface device would be connected to the computer, in order to "generate[] the signals that actually communicate with the computer." *Id.* Under the '399 Patent, the interface device was designed to "receive analog data and convert it to digital data and put it in a form that [could] be transferred to the host computer." *Id.* 1:21-22 (Papst). Digitizing analog data was insufficient by itself; the interface device was also designed to achieve "formatting it into a proper file, put[ting] it in a file system that the host computer [could] recognize," because, otherwise, "the standard driver, disk driver for a computer would not be able to use that digital information." *Id.* 1:22 (Papst). The '449 Patent does not "recite that the interface device has to receive analog data," *id.* 1:21 (Papst), but "[w]ith respect to the [']399 Patent, the Patent [O]ffice thought they were patenting an interface device that received analog data and processed it and provided it to a host computer. And that's what the claims covered." *Id.* 1:25

(Papst).

The '399 and '449 Patents share the same drawings and much of the same specification. The '449 Patent is a "continuation or divisional" patent that covers other aspects of the invention and that "claims priority back to the 399 Patent." *Id.* 1:27, 30 (Papst). The '449 Patent omits references to analog-to-digital conversion but "add[s] in the requirement that when it responds to the inquiry command [from the computer], [the interface device] identifies itself as a storage device." *Id.* 1:29 (Papst).

"[T]he interface device . . . is configured by the processor and the memory. That certainly suggests some software." *Id.* 1:30 (Papst). In addition, the '399 Patent references a "first command interpreter" and a "second command interpreter," both of which are "configured." *Id.* 1:31 (Papst). Thus, at the *Markman* hearing, Papst asserted that the Patents have aspects of both a hardware patent and a software patent. *Id.*; *but see* Papst's *Markman* Br. at 2 (stating that the interface device, "in the context of [the] patents-in-suit, is a hardware device that serves as a bridge between a computer . . . and a data device that acquires or transmits data").

The first Claim of each Patent contains most of the terms that need to be construed. Claim One of the '399 Patent states:

> What is claimed is:
>
> 1. An interface device for communication between a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and a data transmit/receive device, the data transmit/receive device being arranged for providing analog data, comprising:
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> a processor;
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> a memory;
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> a first connecting device for interfacing the host device with the

interface device via the multi-purpose interface of the host device; and

a second connecting device for interfacing the interface device with the data transmit/receive device, the second connecting device including a sampling circuit for sampling the analog data provided by the data transmit/receive device and an analog-to-digital converter for converting data sampled by the sampling circuit into digital data,

wherein the interface device is configured by the processor and the memory to include a first command interpreter and a second command interpreter,

wherein the first command interpreter is configured in such a way that the command interpreter, when receiving an inquiry from the host device as to a type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is an input/output device customary in a host device, whereupon the host device communicates with the interface device by means of the driver for the input/output device customary in a host device, and

wherein the second command interpreter is configured to interpret a data request command from the host device to the type of input/output device signaled by the first command interpreter as a data transfer command for initiating a transfer of the digital data to the host device.

'399 Patent, col. 12:41-67 & col. 13:1-13.

Claim One of the '449 Patent states:

What is claimed is:

1. An interface device for communication between a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and a data transmit/receive device comprising the following features:

a processor;

a memory;

a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device; and

a second connecting device for interfacing the interface device with the data transmit/receive device,

wherein the interface device is configured by the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to the type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device, whereupon the host device communicates with the interface device by means of the driver for the storage device customary in a host device, and

wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a directory structure.

'449 Patent, col. 11:45-67 & col. 12:1-6.

II. LEGAL STANDARDS

A. Claims Construction Principles Generally

The "claims" of a patent are those descriptions of the invention that are numbered and follow the introductory phrase, "[w]hat is claimed." An understanding of a patented invention must start and end with the claims themselves which identify and distinguish the inventor's invention. To determine whether a patent claim has been infringed, a court must undertake a two-step process. The court first construes or interprets each contested claim, or phrase or word within a claim, to determine its meaning and scope; only afterward are the claims compared to the accused device(s). *O.I. Corp. v. Teckmar Co. Inc.*, 115 F.3d 1576, 1580 (Fed. Cir. 1997). This litigation is at the first stage of this process.

The interpretation of patent claims is exclusively a question of law. *Markman*, 517 U.S. 370. In claims construction, a court must interpret the words of each contested claim from the perspective of one skilled in the art at the time of invention, in light of the patent documents and the prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). Words in the claims of a patent are given their ordinary and customary meaning, that is, the meaning that the term would have had to a person of ordinary skill in the pertinent art at the time of the invention. *Id.* at 1312-13. "[T]he 'ordinary meaning' of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1314. Although words are generally given their ordinary meaning, "a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history." *Vitronics Corp. v. Conceptronics Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). When a specification expressly defines terms or defines terms by implication, the specification will be held to limit the claims accordingly. *Phillips*, 415 F.3d at 1321. *Phillips* discredited the approach of prior cases holding that claim terms were to be given the broadest possible ordinary meaning and that the specification should only be consulted for a clear disavowal of such meaning. *Id.* at 1319-21. The *Phillips* court reasoned that this approach resulted in unduly expansive claim construction and improperly restricted the role of the specification in claim construction. *Id.* (disavowing *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002) and cases following its approach).

Claim construction should be undertaken independent of any consideration of how the claims may or may not be read on the accused product. *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1118 (Fed. Cir. 1985). "[C]laims are not construed to 'cover' or 'not to cover'

the accused device. That procedure would make infringement a matter of judicial whim." *Id*.; *see also Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1326-27 (Fed. Cir. 2006) (the court should not prejudge the infringement analysis by construing claims with an aim to include or exclude a particular product, but knowledge of the accused product is helpful to provide context and focus).

In construing a claim, a court starts with the intrinsic evidence of its meaning — the claims, the specification, and the prosecution history. *Vitronics*, 90 F.3d at 1582; *see Pitney Bowes Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999) (the starting point for claim interpretation must be the claims themselves). The "prosecution history" of a patent is the complete public record of the proceeding before the U.S. Patent and Trademark Office ("PTO"). *Phillips*, 415 F.3d at 1317. The public record includes the original application and any claim amendments and explanations made by the applicant. *Vitronics*, 90 F.3d 1582. For example, a patent applicant may limit claims during prosecution by modifying claim language to overcome examiner rejection, by distinguishing a reference, or by disavowing claim coverage. *Omega Eng'g Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323-25 (Fed. Cir. 2003). The specification of a patent "must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science . . . to make and use the same." PTO Rules § 1.71(a). "The specification must set forth the precise invention . . . in such a manner as to distinguish it from other inventions and from what is old." *Id.* § 1.71(b). The specification is the "single best guide to the meaning of a disputed term." *Vitronics*, 90 F.3d 1582.

The Federal Circuit has recognized a fine line between reading a claim *in light of* the

specification and reading *a limitation into a claim from* the specification. *Phillips*, 415 F.3d at 1323. The former is appropriate and necessary; the latter constitutes error. *Id.* For example, a discussion in a specification of a particular embodiment of an invention does not normally confine the invention to that particular embodiment. *Id.* (citing *Nazomi Comm., Inc. v. ARM Holdings, PLC*, 403 F.3d 1364, 1369 (Fed. Cir. 2005)). "To avoid importing limitations from the specification into the claims, it is important to keep in mind that the purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so." *Id.* at 1323. Usually the specification clearly states whether it is setting out specific examples of the invention or whether the patentee intends the embodiments in the specification to be coextensive with the claims. *Id.* A court does not improperly read a limitation into a claim where the claim contains the term and the court looks to the specification for a definition of the term, even if that definition is set forth in a preferred embodiment. *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1378-80 (Fed. Cir. 2006) (claim limited by the term "adjustable" and specification defined term).

Courts may not redraft claims to make them operable or to sustain their validity. *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004). However, "[w]hen claims are amenable to more than one construction, they should when reasonably possible be interpreted so as to preserve their validity." *Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545, 1557 (Fed. Cir. 1996).

B. Use of Expert Testimony

Expert testimony regarding the construction of claim terms is outside the claims, the specification, and the prosecution history and is, therefore, extrinsic to those vital sources of

information. If the intrinsic information from those sources is unambiguous or sufficient for claims construction, a court should not rely on extrinsic evidence, such as expert testimony, to determine the meaning of the claims. *Boss Control, Inc. v. Bombardier, Inc.*, 410 F.3d 1372, 1377 (Fed. Cir. 2005); *Bell & Howell Doc. Mgmt. v. Altek Sys.*, 132 F.3d 701, 706 (Fed. Cir. 1977). That is, extrinsic evidence may not be "used to vary claim terms from how they are defined, even implicitly, in the specification or file history." *Vitronics*, 90 F.3d 1584-85. However, extrinsic evidence may be considered for the purpose of:

> (1) providing background on the technology;
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> (2) explaining how an invention works;
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> (3) ensuring that the court's understanding of the technical aspects comports with that of a person skilled in the art; and/or
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> (4) establishing that a particular term in the patent or prior art has a particular meaning in the relevant field.

Phillips, 415 F.3d at 1318. Whether to admit extrinsic expert testimony lies in a court's discretion. *Inpro II Licensing, S.A.R.L. v. T-Mobile USA, Inc.*, 450 F.3d 1350, 1357 (Fed. Cir. 2006); *Serio-US Indus., Inc. v. Plastic Recovery Tech. Corp.*, 459 F.3d 1311, 1319 (Fed. Cir. 2006). If admitted, expert testimony must be considered in the context of the patent and the file history. *Phillips*, 415 F.3d at 1319.

In this case, the Court held a tutorial hearing on September 3, 2008, prior to the *Markman* hearing. At the tutorial, the Court heard and admitted evidence from experts falling under the first three categories identified in *Phillips*. Papst also sought to admit expert evidence for the purpose of the claims construction hearing. Papst submitted with its opening brief the declaration of an expert, C. Douglass Locke, Ph.D. *See* Papst's *Markman* Br., Ex. C. Because the intrinsic

evidence — the claims, the specification, and the prosecution history — provide the full record necessary for claims construction, the Court did not admit expert testimony at the *Markman* hearing. To the extent that Papst relies on the Locke Declaration for the definition of the claims in the Patents, *see* Papst's *Markman* Br. at 21-24, the Court will disregard the Declaration.

III. ANALYSIS

The Camera Manufacturers have asked the Court to construe a series of terms from the Patents. Papst approached the *Markman* briefing with a less specific (and less helpful) analysis that combined terms and concepts directed more to the accused cameras than to the invention itself. The task is made more difficult because the invention was never, as far as the record reveals, actually manufactured or used as contemplated by the inventor. The Court directed argument at the hearing to follow the order of terms identified by the Camera Manufacturers in Exhibit R to their opening *Markman* Brief [Dkt #188] and thereafter to address a few additional terms proposed for construction by Papst (some of the latter are no longer at issue). Thus, the Court construes the following terms from the Patents:

    A. "interface device"

    B. "host device"

    C. "data transmit/receive device"

    D. "for communication between [the host device and the data transmit/receive device]"

    E. "multi-purpose interface"

    F. "interfacing"

    G. "a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device"

H. "second connecting device for interfacing the interface device with the data transmit/receive device"

I. "first command interpreter" and "sends a signal regardless of the type of data"

J. "second command interpreter"

K. "wherein the interface device is configured by the processor and memory to include a first command interpreter and a second command interpreter"

L. "inquiry" and "inquiring"

M. "the driver"

N. "an input/output [storage] device customary in a host device"

O. "the driver for the input/output [storage] device customary in a host device"

P. "the usual driver for the input/output [storage] device"

Q. "whereupon the host device communicates with the interface device by means of the driver for the input/output [storage] device customary in a host device"

R. "the digital data"

S. buffer terms — "a buffer to buffer data to be transferred between the data transmit/receive device and the host device" and "a data buffer for permitting independence in terms of time of the data transmit/receive device attachable to the second connecting device from the host device"

T. "virtual files"

U. "simulating a virtual file system"

V. "specific driver for the multi-purpose interface"

W. "digital signal processor"

X. "memory"

Y. "root directory" and "processor"

Z. Claim Two of the '399 Patent

A. "interface device"

The Camera Manufacturers propose that the term "interface device" be construed to mean "a stand-alone device that a user can readily physically connect to and disconnect from a host device and a data transmit/receive device and that directs communication between these devices when they are connected." Tr. 1:104 (CMs). They assert that the invented "interface device" is for communicating between a host device and a data transmit/receive device, *i.e.*, the invention is neither the host nor the data transmit/receive device, but rather a separate device that enables communication between the other two. Papst retorts that "interface device" should be construed to mean the structure defined in the body of the Claims and that nothing in the Claims requires the interface device to be separate from the data transmit/receive device.[5]

Claim One of the Patents contains a preamble that limits the Claim. Claim One of the Patents states:

> What is claimed is:
>
> 1. *An interface device for communication between a host device, which comprises drivers for input/output devices customary in a host device and a multi-purpose interface, and a data transmit/receive device, the data transmit/receive device being arranged for providing analog data*, comprising:
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> a processor;
>
> a memory;

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[5] Papst recognizes that the data transmit/receive device may be separate from the interface device. It appears to argue, however, that according to the invention the interface device and the data transmit/receive device could be in a single device. *See* Tr. 1:123 (Papst) ("[T]he data transmit/receive device, you know, that's the part that doesn't have to be part of the interface device. . . . [T]his claim would be infringed whether or not you include the data transmit/receive device in the final product."). Papst does not contend that the interface device could be inside the chassis of the host device, the computer.

a first connecting device . . .; and

a second connecting device . . . .

'399 Patent, col. 12:41-53 (emphasis added); '449 Patent, col. 11:45-57(same). The preamble to

Claim One is the portion in italics above. Papst asserts that the term "interface device" as set forth

in the preamble does not limit the Claim and thus the term should not be construed by the Court.

Specifically, Papst contends that the preamble uses the words "[a]n interface device . . . comprising,"

thereby indicating that the invention is defined in the body of the Claim, *i.e.*, "a processor; a

memory; a first connecting device . . . ; and a second connecting device . . . ." '399 Patent, col.

12:48-54; '449 Patent, col. 11:51-57. Papst further argues that to construe the term "interface

device" in the preamble would be to improperly import limitations from the specification into the

Claim. *See Phillips*, 415 F.3d at 1323.[6]

The preamble to Claim One serves as a claim limitation for three reasons. First, "[i]f

the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or

if the claim preamble is necessary to give life, meaning, and vitality to the claim, then the claim

preamble should be construed as if in the balance of the claim." *Pitney Bowes*, 182 F.3d at 1305

(internal quotation omitted). In these Patents, the preamble is limiting because it describes structures

that comprise the invention and the relationships among those structures: "An interface device for

communication between a host device . . . and a data transmit receive device." *See* '399 Patent, col.

12:42-45; '449 Patent, col. 11:46-49.

Second, where a preamble provides an antecedent basis for terms found in the body

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[6] Despite its position that the term "interface device" should not be construed, Papst concedes that the terms "host device" and "data transmit/receive device" which are also found in the preamble "may benefit from further explanation because some actual claim elements are defined in terms of their relationship to those terms." Papst's *Markman* Br. at 15.

of the claims, it acts as a "necessary component of the claimed invention" and serves as a claim limitation. *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952-53 (Fed. Cir. 2006). Here, the body of the Patents repeatedly refers back to the structures first identified in the preamble by using the word "the" and thus incorporates the terms by reference. *See, e.g.*, '399 Patent, col. 12:50-52 ("a first connecting device for interfacing the host device with the interface device . . . ."); '449 Patent, col. 11:53-55 (same).

Third, where a preamble is used during prosecution of the patent to distinguish prior art, the preamble may serve as a claim limitation. *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1347 (Fed. Cir. 2008). In the prosecution history for the '399 Patent, Mr. Tasler distinguished prior art (the McNeil patent, U.S. Patent No. 5,499,378) by amending the preamble to state ". . . and a data transmit/receive device, <u>the data transmit/receive device being arranged for providing analog data</u> . . . ." CMs' *Markman* Br., Ex. C (" '399 File History") at 4-7 (underlined in original to show additional phrase). The preamble, as amended to distinguish prior art, serves as a claim limitation.

In sum, because the preamble describes the structure of the invention and gives meaning to Claim One, it must be interpreted as a claim limitation. Accordingly, the term "interface device" as used in the preamble should be construed.

The body of Claim One of the Patents indicates that the "interface device" is a stand-alone device. The '399 Patent describes the communication (via the interface device) between a host device and a data transmit/receive device as involving a first command interpreter that, when asked by the computer "as to a type of a device attached to the multi-purpose interface of the host device [computer], sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device . . . that it is an input/output device customary in

a host device." '399 Patent, col. 12:66-67 & col. 13:1-5. The '449 Patent is similar:

> the interface device is configured by the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to the type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device . . . .

'449 Patent, col. 11:59-67. In both Patents, the language "regardless of the type of the data transmit/receive device attached" strongly indicates that various kinds of data transmit/receive devices could be attached and that, therefore, the interface device was neither a permanent part of the data transmit/receive device nor of the host device/computer.

Similar language is repeated throughout both Patents. *See, e.g.*, '399 Patent, Title, Abstract & col. 3:43-44 ("regardless" language); '449 Patent, Title, Abstract & col. 4:6-7 (same); *see also* '399 Patent, col. 3:24-27 ("It is an object of the present invention to provide an interface device for communication between a host device and a data transmit/receive device whose use is host device-independent . . . ."); '449 Patent, col. 3:20-23 ("It is *the* object of the present invention to provide an interface device for communication between a host device and a data transmit/receive device whose use is host device-independent . . . .") (emphasis added).

That the data transmit/receive device must be a separate device from the invention is not mere happenstance but an integral aspect of what was invented. Whatever uncertainty on this point may exist after studying the Claims is eliminated upon a review of the specification. The specification always describes three separate devices: the computer, the data transmit/receive device (an I/O device), and the interface device. *See, e.g.*, '399 Patent, Title, Abstract, col. 1:1-14, col. 3:25-28, col. 5:30-32, col. 5:47-63, Figs. 1-2 and accompanying text; '449 Patent, Title, Abstract,

col. 1:1-17, col. 3:21-23, col. 4:35-36, col. 4:40-63, Figs. 1-2 and accompanying text; *see also* '399 Patent, col. 5:56-60 (describing Figure 1 as showing that the "second connecting device can be attached by means of an output line 16 to a data transmit/receive device which is to receive data from the host device or from which data is to be read, *i.e.* acquired, and transferred to the host device."); '449 Patent, col. 4:55-59 (same).

As explicitly explained in the specification, one of the problems with prior art, when attached "to a device whose data is to be acquired," was that "it is often very difficult to implement such interfaces for *portable* systems and they offer few possibilities for adaptation with the result that such systems offer *little flexibility*." '399 Patent, col. 1:21-22 & 31-34 (emphases added); '449 Patent, col. 1:22-23 & 32-35 (same). And yet portability and flexibility were critical because "[t]he devices from which data is to be acquired cover the entire electrical engineering spectrum." '399 Patent, col. 1:34-35; '449 Patent, col. 1:35-36. "[A]n interface may be put to totally different uses. It is therefore desirable that an interface be sufficiently *flexible* to permit attachment of very different electrical or electronic systems to a host device by means of the interface." '399 Patent, col. 1:56-59 (emphasis added); '449 Patent, col. 1:57-60 (same).

The invention was designed to answer these shortcomings of prior art and to provide a "flexible interface" that would allow communication between a computer and "an analog I/O device . . . regardless of the type of the I/O device." '399 Patent, Title; '449 Patent, Title. The specification touts the "enormous" benefit of allowing communication between a computer and many different types of data transmit/receive devices:

> In the interface device *according to the present invention an enormous advantage is to be gained*, as apparent in the embodiment described in the following, in separating the actual hardware required

to attach the interface device 10[7] to the data transmit/receive device
from the communication unit . . . as *this allows a plurality of
dissimilar device types* to be operated in parallel in identical manner.

'399 Patent, col. 8:23-31 (emphases added); '449 Patent, col. 7:23-31 (same). It is well-settled that

"[w]hen a patent thus describes the features of the 'present invention' as a whole, this description

limits the scope of the invention." *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295,

1308 (Fed. Cir. 2007). The description in the specification, therefore, necessarily limits the scope

of the '399 and '449 Patents when it refers to the enormous advantage of "*the* present invention,"

to allow a plurality of dissimilar input/output devices to be accessed.

The specification also explains that the interface device provides a "universal

solution" without regard to the types of data transmit/receive devices from which data may be

acquired. '399 Patent, col. 12:37-40 ("The interface device 10 thus provides a universal solution

which can cover the entire spectrum of possible data transmit/receive devices."); '449 Patent, col.

11:41-44 (same). Examples of transmit/receive devices that can be connected to a computer via the

interface device include a "diagnostic radiology system in a medical engineering environment" and

a "multimeter." '399 Patent, col. 1:34-54; '449 Patent, col. 1:35-55. The specification also notes

the advantage to users of the interface device that they can obtain data from almost any data transmit/

receive device with little prior knowledge:

By creating and editing a configuration file, normally a text file which
is simple to understand with little prior knowledge, users of the
interface device 10 are able to perform essentially identical operator
actions for almost any data transmit/receive devices which can be

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[7] At times, the specification refers to the invention, its various components, and the devices
to which it connects by numbers shown in Figure One as follows: interface device 10; host device
11; first connecting device 12; digital signal processor 13; memory 14; second connecting device 15;
and data transmit/receive device 16. *See* '399 Patent, Sheet One; '449 Patent, Sheet One.

attached to the second connecting device via the line 16, thus eliminating a source of error arising from users having to know many different command codes for different applications.

'399 Patent, col. 7:37-45; '449 Patent, col. 6:37-45; *see also* '399 Patent, col. 1:34-46 (explaining that the interface device could be used to simplify the data read/acquisition work of field technicians); '449 Patent, col. 1:35-47 (same).

As one learns from studying the Patents, the purpose of the invention was to allow fast communication between dissimilar data transmit/receive devices and computers, without the need for special software drivers. Thus, the invention cannot properly be limited to an interface device that is incapable of allowing a plurality of dissimilar transmit/receive devices to be connected or that cannot be flexible and portable to allow a plurality of dissimilar transmit/receive devices to be attached.

This conclusion is further buttressed by the identical Figures that accompany each Patent. Figure 1 of each Patent "shows a general block diagram of the interface device according to the present invention," *see* '399 Patent, col. 5:38-39; '449 Patent, col. 4:41-42, and the Figure indicates that the data transmit/receive device is off the sheet, out of sight, not part of the Figure, and not part of the invention. '399 Patent, Sheet 1 ("to data transmit/receive device"; lower case substituted); '449 Patent, Sheet 1 (same). Figure 2 of each Patent, which depicts a preferred embodiment of the invention, also indicates that the data transmit/receive device and the host device/ computer are separate and apart from the invention. '399 Patent, Sheet 2; '449 Patent, Sheet 2. The specification and Figures further indicate that the interface device is separate from the host computer and the transmit/receive device because it is designed to plug into an electrical outlet. *See* '399 Patent col. 9:65-66 ("The complete interface device 10 is supplied with power by an external AC/DC

converter 1800 . . . ."); '449 Patent, col. 8:65-66 (same); *see also* '399 Patent, Sheet 2; '449 Patent, Sheet 2.

The prosecution history of the '399 Patent also supports the conclusion that the interface device is a stand-alone device. Mr. Tasler amended Claim One to add the phrase, "<u>wherein the first command interpreter is configured in such a way that the command interpreter</u>, when receiving an inquiry from the host device as to [the] <u>a</u> type of a device attached to the multi-purpose interface of the host device." '399 File History at 7 (underlined in original to show additional phrase; brackets in original to show deleted word).[8] The change from "the device" to "a device" is a change to more general language, indicating that the interface device was intended to be attached to, and detached from, various types of input/output devices. Mr. Tasler also explained to the PTO that "it is clear that the data transmit/receive device *to be connected* to the second connecting device of the subject interface provides analog data." *Id.* at 5 (emphasis added). The statement that the data transmit/receive device is "to be connected" similarly indicates that the inventor did not intend the interface device to be permanently affixed to a single data transmit/receive device, as it is "to be connected" to various data transmit/receive devices.

Papst argues that interpreting "interface device" to mean a stand-alone device would "improperly import[] the limitations from the spec[ification] to the claims. The claims don't say stand alone, they don't say physically connect, or readily connect or disconnect . . . ." Tr. 1:84 (Papst). The Court disagrees. The interface device, as discussed further below, "sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device

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[8] Interestingly, Mr. Tasler reverted to the language "the device" in the '449 Patent. '449 Patent, col. 11:62.

of the interface device." '399 Patent, col. 13:1-5; '449 Patent, col. 11:63-65. Claim One

contemplates and intends that a variety of transmit/receive devices may be connected to the interface

device, which is also connected to the computer. To fulfill claim One, the "interface device" must,

therefore, be a "stand-alone device."

B. "host device"

Claim One of both Patents claims "[a]n interface device for communication between

a *host device*, which comprises drivers for input/output devices customary in a *host device* and a

multi-purpose interface, and a data transmit/receive device . . . ." '399 Patent, col. 12:42-45

(emphasis added); '449 Patent, col. 11:46-49 (same). The Camera Manufacturers propose that "host

device" be construed to mean "a general purpose computer that connects to and controls the

operation of peripherals," CMs' *Markman* Br. at 9, while Papst proposes "a general purpose

computer to which hardware devices may be attached, such as Personal Computers ("PCs") and other

host computer systems as described in the patent written description, including drivers for

input/output devices customary in a host device and a multi-purpose interface." Papst's Revised

Appendix of Claim Constructions [Dkt. # 244, Ex. C] ("Papst's App.") at 2. Papst also objects to

the phrase "controls the operation of peripherals" in the Camera Manufacturers' proposed definition.

Neither Figure One nor Figure Two of the Patents shows a "host device;" the Figures only indicate

where one would be connected to the invention.

The Patent Claims refer solely to a "host device," but the specification clarifies the

nature of the intended host device. *See* '399 Patent, col. 1:9-11 ("The present invention relates to

the transfer of data and in particular to interface devices for communication between a *computer or*

host device and a data transmit/receive device . . .") (emphasis added); '449 Patent, col. 1:13-15

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(same). Thus, the "host device" is a computer, and the Court uses the terms interchangeably hereafter.

The specification identifies "common host devices which can be, for example, IBM PCs, IBM-compatible PCs, Commodore PCs, Apple computers or even workstations." '399 Patent, col. 4:31-33; '449 Patent, col. 3:34-36. The specification further requires the host device to have "a driver for an input/output device customary in a host device," such as, "drivers for hard disks, for graphics devices or for printer devices," of which the hard disk driver is the preferred embodiment. '399 Patent, col. 4:25-30, 34-36; '449 Patent, col. 3:29-34, 38-40. The Patents tout the advantage of attaching "host devices or computer systems" by means of the invention to a "device whose data is to be acquired." '399 Patent, col. 1:20-22; '449 Patent col. 1:21-23. Thus, the inventor intended his "host device" to include most computers — PCs, Apples, workstations — as long as they had a driver for a customary input/output device and a multi-purpose interface.

As the Camera Manufacturers suggest, there is little substantive difference between their construction of "host device" and that offered by Papst, although they argue that their definition is more clear and concise. It may be that the development of computers since the application for the '399 Patent makes it somewhat more complicated: the inventor specified customary drivers and a "multi-purpose interface" that had to be present in his "host device," intimating that not all computers of that time necessarily had such devices inside their chassis. *See* '399 Patent, col. 4:27-30 ("Drivers for input/output devices customary in a host device which are found in practically all host devices are, for example, drivers for hard disks, for graphics devices or for printer devices."); '449 Patent, col. 3:31-34 (same); *see also* '399 Patent, col. 5:9-12 ("As support for hard disks is implemented as standard in all commercially available host systems, the simulation of a hard disk,

for example, can provide host device-independent use."); '449 Patent, col. 4:14-17 (same).[9] Now

all computers come so equipped. Nonetheless, construing the Claims as of the relevant time period,

the Court concludes that the Camera Manufacturers' proposal omits two critical aspects of the host

device, without which the invention cannot operate: customary drivers and a multi-purpose

interface.

As to the Camera Manufacturers' proposal that "host device" be defined as a

computer that "controls the operation of peripherals," the Court finds that this aspect of a host device

is critical to the ability of a host device to communicate through the invented interface device. That

is, the host device must have internal drivers, *i.e.*, software, to instruct hardware how to operate. As

Papst acknowledged, drivers "are the software programs that are used by the computer[] to

communicate with the hardware that's attached to the computer. So for each and every hardware

device that you connect to a computer there has to be a driver that allows the computer to

communicate with that hardware device." Tr. 1:5 (Papst). The specification explains that such

drivers can instruct a hard drive (the preferred embodiment) that is internal to the computer, or such

drivers can instruct a printer that is external to the computer. In all instances, the driver instructs the

how and when of hardware operation and thus directs it. Further discussion of the element of

"control" is found below in the construction of the term "driver."

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[9] *See* '399 Patent, col. 4:44-56 ("Multi-purpose interfaces comprise both an interface card and specific driver software for the interface card. The driver software can be designed so that it can replace the [Basic Input/Output System or "BIOS"] driver routines. Communication between the host device and the devices attached to the multi-purpose interface then essentially takes place by means of the specific driver software for the BIOS routines of the host device. Recently however drivers for multi-purpose interfaces can also be integrated in the BIOS system of the host device as, alongside classical input/output interfaces, multi-purpose interfaces are becoming increasingly common in host devices."); '449 Patent, col. 3:48-60 (same).

The Court construes "host device" in the Claims of the Patents to mean "a general purpose computer that connects to and directs the operation of peripherals, including drivers for input/output devices customary in a host device and a multi-purpose interface."

C. "data transmit/receive device" and "the data transmit/receive device being arranged for providing analog data"[10]

Mr. Tasler did not invent a data transmit/receive device, and Papst objects to any construction of the term. Tr. 1:136 (Papst) ("So our first position, of course, is that we shouldn't be defining this as part of the claimed invention."). While Papst asserts that the term "data transmit/receive device" is not a claim limitation, Papst concedes that the term may be construed "for context" as "a device that receives input and provides data to the interface device." Papst's App. at 2. The Court agrees that it should not define the nature of a data transmit/receive device. What is at issue, however, is the communication capability between the invented interface device and a data transmit/receive device, which is very much part of construing the Claims, and the Court construes "data transmit/receive device" in this context.

The parties disagree as to whether the "data transmit/receive device" mentioned in the Patents must be capable of performing two-way communication. Papst cites to the specification, to wit, "The present invention relates to the transfer of data and in particular to interfaces for communication between a computer or host device and a data transmit/receive device from which data is to be acquired *or* with which two-way communication is to take place." '399 Patent, col. 1:9-13 (emphasis added); '449 Patent, col. 1:13-17 (same). The Camera Manufacturers propose to

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[10] "In the 399 Patent the claims do require that the . . . interface device be able to receive analog data. In the 449 Patent the claims do not recite that the interface device has to receive analog data." Tr. 1:21 (Papst).

construe the term as "a device that *transmits data to and receives data from* the host device when connected to the host device by the interface device." CMs' *Markman* Br. at 10 (emphasis added). These positions are again hotly contested on reconsideration.

The Court turns to the claim language in the first instance and then to the specification for elucidation. *Phillips*, 415 F.3d at 1315 (the specification is the "single best guide to the meaning of a disputed term" and "[u]sually it is dispositive"). The preamble to Claim One of the Patents states, "[a]n interface device for *communication between* a host device . . . and a data transmit/receive device . . . ." '399 Patent, col. 12:42-45 (emphasis added); '449 Patent, col. 11:47-49 (same). "Communication between" suggests bi-lateral interchanges.[11]

Figures 1 and 2 that accompany both Patents show bidirectional arrows connecting the invention to the data transmit/receive device. Figure 1 "shows a general block diagram of *the* interface device *according to the present invention*" and Figure 2 shows a "detailed block diagram of *an* interface device *according to a preferred embodiment* of the present invention." '399 Patent, col. 5:38-42; '449 Patent, col. 4:41-44 (emphases added); *see* '399 col. 9:29-30 ("In the preferred embodiment of the interface device 10 shown in FIG. 2 . . . ."); '449, col. 8:29-30 (same); *but see* '399 col. 9:15-16 ("Figure 2 shows a detailed block diagram of an interface device, according to *the* present invention") (emphasis added); '449, col. 8:15-16 (same). Again, the description of features of "the present invention" limits the scope of the invention. *Verizon*, 503 F.3d at 1308. In explaining the invention, Mr. Tasler specified that his Figures contained "bidirectional

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[11] Claim One of the '399 Patent uses the words "to" or "from" when discussing one-way communication. *See, e.g.*, '399 Patent, col. 13:8-13 ("wherein the second command interpreter is configured to interpret a data request command *from* the host device *to* the type of input/output device signaled by the first command interpreter as a data transfer command for initiating a transfer of the digital data *to* the host device.") (emphases added).

communication lines (shown for all lines by means of two directional arrows)." '399 Patent, col.

5:49-56; '449 Patent, col. 4:51-55 (same except "bidirectional" is spelled "bi-directional"). In other

words, he describes an invention in which communication appears to go in both directions.

Additionally, in providing background to the invention, the specification states that

"[t]he devices from which data is to be acquired cover the entire electrical engineering spectrum"

and constitute "very different electrical or electronic systems." '399 Patent, col. 1:34-35, 56-59;

'449 Patent, col. 1:36-37, 57-60; *see also* '399 Patent, col. 12:37-40 (the specification concludes,

"[t]he interface device thus provides a universal solution which can cover the entire spectrum of

possible data transmit/receive devices."); '449 Patent, col. 11:41-44 (same).

Even more pointed language in the specification describes Figure 1 as showing:

> The second connecting device can be attached by means of an output
> line 16 to a data transmit/receive device which is to receive data from
> the host device or from which data is to be read, i.e. acquired, and
> transferred to the host device. The data transmit/receive device itself
> can also communicate actively with the host device via the first and
> second connecting device . . . .

'399 Patent, col. 5:56-62; '449 Patent, col. 4:55-61. This language supports the conclusion that, as

its name implies, the data transmit/receive device is to "receive data from the host device," or it is

the site "from which data is to be read" and it "can also communicate actively with the host device."

Id. The specification also notes an "important advantage of the interface device of the present

invention" is the "extremely high data transfer rates by using, *for data interchange*, the host device-

own [sic] BIOS routines." '399 Patent, col: 8:43-46; '449 Patent, col. 7:43-47 (emphasis added).

In every instance, the Claims, Figures, and specification refer to data transmit/receive

devices and not to "data transmit devices" or "data transmit or receive devices." In fact, the name

of the interface device itself emphasizes that both data transfer and receipt are important attributes

of the data transfer/receive device: the invention is a "flexible interface for communication between

a host and an analog I/O device," *i.e.*, the data transmit/receive device is an input and output device.

'399 Patent, Title; '449 Patent, Title.

From this analysis, the Court initially concluded, "While the data transmit/receive

device does not engage in two-way communication at all times, the Claims and specification require

it to have the capability of two-way communication." Mem. Op. [Dkt. # 312] at 29. On

reconsideration, the Court finds that it erred, despite the language of the specification on which it

relied.

In both Figures 1 and 2, the line identified as 16 has two-way arrows, which the

inventor informs us means "bidirectional communication lines (shown for all lines by means of two

directional arrows)." '399 Patent, col. 5:55-56; '449 Patent, col. 4:54-55 (same except

"bidirectional" is spelled "bi-directional"). However, while Figure 2 shows bidirectional arrows

between the interface device and the transmit/receive device, the internal structure of the interface

device in Figure 2 reveals unidirectional interaction, with Bayonet Neill-Conselman (BNC)

connectors that can only receive data and single direction arrows flowing from the sample and hold

circuit (which receives its data from the transmit/receive device) toward the other components of the

interface device, including the analog to digital converter and the data signal processor. *See* '399

Patent, Sheet 2; '449 Patent, Sheet 2. There is no circuitry revealed in Figure 2 which would transfer

data *from* the interface device *to* the transmit/receive device even though the specification describes

it as having "bidirectional communication lines."

This point is argued strenuously by the parties in their briefs on reconsideration.[12]

Papst has the better side of the argument. "[I]t is unlikely that an inventor would define the invention in a way that excluded the preferred embodiment." *Hoechst Celanese Corp. v. BP Chemicals, Ltd.*, 78 F.3d 1575, 1581 (Fed. Cir. 1996). Figure 2, the preferred embodiment, shows a device that can acquire data from the data transmit/receive device but cannot send data back to the data transmit/receive device via line 16. With this understanding, the first sentence of the specification — referring to "a data transmit/receive device from which data is to be acquired *or* with which two-way communication is to take place"[13] — takes on new meaning.

The Court thus construes the term "data transmit/receive device" to mean "a device that is capable of either (a) transmitting data to or (b) transmitting data to and receiving data from the host device when connected to the host device by the interface device."

D. **"for communication between [the host device and the data transmit/receive device]"**

Papst proposes that "for communication between" the computer and the data transmit/receive device should be construed to include one-way or two-way communication, or both. Papst's App. at 2; *see also* Papst's Mot. for Reconsideration [Dkt. # 321] at 7. The Camera Manufacturers propose that the phrase "for communication between" means "for transmitting of information bidirectionally and actively between the two devices." CMs' PowerPoint Slides [Dkt. # 267] ("CMs' Slides") at 55.

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[12] It was the Court's neutral expert, Dr. Ronald Williams, who noted the anomaly between the language of the specification and the bidirectionality of the line at 16 compared to the BNC receptors in Figure 2, which are incapable of sending data to the data transmit/receive device. *See* Mem. Op. [Dkt. # 312] at 28 n.12.

[13] *See* '399 Patent at 1:12-14; '449 Patent col. 1:15-17.

As more fully explained above, the preamble to Claim One states, "[a]n interface device for *communication between* a host device . . . and a data transmit/receive device . . . ." '399 Patent, col. 12:42-45 (emphasis added); '449 Patent, col. 11:47-49 (same). The specification describes active communication and data interchange between the host device and the data transmit/receive device via the interface device. *See* '399 Patent, col. 5:56-62 ("The data transmit/receive device itself can also communicate actively with the host device via the first and second connecting device . . . ."); '449 Patent, col. 4:55-61 (same); '399 Patent, col. 8:43-46 (an "important advantage of the interface device of the present invention" is the "extremely high data transfer rates by using, for data interchange, the host device-own [sic] BIOS routines."); '449 Patent, col. 7:43-47 (same). And the specification also refers to the data transmit/receive device as one "from which data is to be acquired *or* with which two-way communication is to take place." *See* '399 Patent at 1:12-14; '449 Patent col. 1:15-17.

With a change in the construction of the communications ability of the transmit/receive device, it is necessary to change this construction as well. Figure 2, the preferred embodiment, does not reveal any possibility of the interface device transmitting data to the data transmit/receive device or of "active" communications between the transmit/receive device and the host device. Accordingly, the Court accepts Papst's proffered construction. The phrase "for communication between" the host and the data transmit/receive device means "for transmitting data either (a) from the data transmit device to the host or (b) bidrectionally between the host and the transmit/receive device."

E. "multi-purpose interface"

The Camera Manufacturers propose that "multi-purpose interface" be construed to

mean "a communication interface designed for use with multiple devices having different functions from each other." CMs' Slides at 62. Papst proposes that it means "a computer interface which supports more than one type of device." Papst's App. at 2. Papst conceded at the *Markman* hearing that the definition proposed by the Camera Manufacturers is satisfactory, as long as it provides that multiple devices are connected one at a time. Tr. 1:156-57 (Papst) ("COURT: Your problem is temporal, not otherwise. You don't have any problem with multiple devices having different functions from each other as long as they're plugged in one at a time? PAPST: Right, Your Honor."). The Patents do not answer this point,[14] and the Court declines to add an unspoken limitation. With the parties' essential agreement, the Court thus construes "multi-purpose interface" to mean "a communication interface designed for use with multiple devices that can have different functions from each other."

F. "interfacing"

The Patents state, "a first connecting device for *interfacing* the host device with the interface device via the multi-purpose interface of the host device; and a second connecting device for *interfacing* the interface device with the data transmit/receive device . . . ." '399 Patent, col. 12:51-55; '449 Patent, col. 11:54-58. Papst suggests that "interfacing" refers to "establishing communication with the computer," *i.e.*, electronic data communication and not physical connection. Papst's App. at 3; *see also* Tr. 1:158-59 (Papst). The Camera Manufacturers insist that "interfacing" means "physically connecting." CMs' Slides at 69.

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[14] *See* '399 Patent, col. 4:48 (ambiguously stating, "[c]ommunication between the host device and the devices attached to the multi-purpose interface then essentially takes place by means of the specific driver software for the multi-purpose interface . . ." without indicating whether such devices are connected to the multi-purpose interface one at a time).

Papst proposes the better construction. "Interfacing" means establishing communication or enabling communication between two devices. Figure 2, the preferred embodiment of the invention, shows a 10MB/s SCSI interface chip. *See* '399 Patent, Sheet 2; '449 Patent, Sheet 2. The chip does the work of interfacing with the host computer, while the 50-pin connector to which it is attached does the job of connecting.[15]

The Camera Manufacturers object to Papst's proposed construction by pointing out that "interfacing" is what the first and second connecting devices do, while communicating is what the command interpreters do. The Court does not disagree. But the Court does not interpret "interfacing" as communicating. "Interfacing" means making communication possible. "[I]nterfacing isn't really about the physical connections, it's about establishing the communication and in getting information across the boundary." Tr. 1:166 (Papst). Interfacing "is getting the right electrical signals in the right order with the right voltages with the right timing." Tr. 2:13 (Papst). Accordingly, the Court construes "interfacing" as used in the Patent Claims as meaning "establishing communication with."

G. "a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device"

The parties part ways dramatically on the construction of the term "the first connecting device" in the phrase "a first connecting device for interfacing the host device with the interface device via the multi-purpose interface of the host device." *See* '399 Patent, col. 12:51-53; '449 Patent, col. 11:53-55. The Camera Manufacturers propose that the "first connecting device" is "a physical plug or socket for permitting a user to readily attach and detach the interface device

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[15] *See* discussion of the term "connecting device" below.

with the host device." CMs' Slides at 77. Papst does not construe the term "connecting device" as an object, but jumps instead to the interfacing function of the first connecting device and proposes that the first connecting device be construed to mean "the circuit device used to *couple* the interface device to the multi-purpose interface of a computer." Papst's App. at 3 (emphasis added). Papst asserts that "the first connecting device needs to be interpreted along with the entire paragraph . . . and it's the connecting device for interfacing with the multi-purpose interface." Tr. 2:12 (Papst). Papst then goes on to describe its interpretation of "interfacing:"

> [Interfacing] means adhering to the protocols for the electrical signals and the formatting of the data as it goes out [and] when it's being transmitted from one device to another. And that's how you achieve interfacing in the context of this claim.
>
> . . .
>
> So while the software is generating the information that gets sent, the connecting device is what actually, . . . that's where the information gets turned into a signal and in the case of a SCSI [small computer system interface] interface gets put on a wire . . . . [T]hat's what is meant by interfacing and this is getting the right electrical signals in the right order with the right voltages with the right timing.

Id. at 12-13 (Papst).

The Claims, Figure 2, and the specification do not support Papst's definition as it would apply to "first connecting device." The Claims explain that the first connecting device is used "for interfacing," for establishing communication as defined above. That function does not describe the physical nature of the first connecting device itself. Taken into a different context, Papst's proposed construction would confuse a wall socket that accepts the plug from a lamp with the function that, once a plug is entered into a wall socket, the wall socket allows alternating current to reach the lamp and light its bulb. Despite this function, no one could confuse the wall socket itself

with the current that flows after a plug is inserted.

The specification illustrates the physical nature of the first connecting device. The specification describes the first connecting device as containing various devices which require a physical, wired connection:

> In the preferred embodiment of the interface device 10 shown in FIG. 2, the first connecting device 12 of FIG. 1 contains the following components: an SCSI interface 1220 and a 50-pin SCSI connector 1240 for attachment to an SCSI interface present on most host devices or laptops. The SCSI (small computer system interface) 1220 translates the data received via the SCSI connector 1240 into data understood by the DSP 1300, as known by those skilled in the art. Further, the first connecting device 12 comprises an EPP (enhanced parallel port) with a data transfer rate of approx. 1 MBps which delivers a more moderate data transfer rate of 1 MBps by comparison to the data transfer rate of 10 MBps of the SCSI interface. The EPP 1260 is connected to a 25-pin D-shell connector 1280 to permit attachment to a printer interface of a host device for example. Optionally, the first connecting device 12 also comprises a 25-pin connector 1282 which permits the attachment of 8 digital outputs and 8 digital inputs 1284 at the host device.

'399 Patent, col. 9:29-47; '449 Patent, col. 8:30-48. Figure 2 shows a "25-pin connector," a "25-pin D-shell connector," and a "50-pin SCSI connector" for connecting a cable between the interface device and the host device/computer. *See* '399 Patent, Sheet 2; '449 Patent, Sheet 2; *see also* Tr. 1:164-65 (Papst) (the SCSI device shown in Figure 2 would require a wired connection).

Further, the specification refers to "attachment" of various types of transmit/receive devices, via the interface device, to a host computer. *See* '399 Patent, col. 1:56-59 ("It is therefore desirable that an interface be sufficiently flexible to permit *attachment* of very different electrical or electronic systems to a host device by means of the interface.") (emphasis added); '449 Patent, col. 1:57-60 (same). And, the specification refers to a "line" connecting the host computer and the interface device: "whereby the [second command interpreter] begins to transfer data from the data

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transmit/receive device via the second connecting device *and via the line 11 to the host device*."

'399 Patent, col. 6:53-67 (emphasis added). The terms "attachment"and "line" connote a physical connection.

The "first connecting device" is, therefore, a socket with a varying physical arrangement of pins (connectors) that allows different cables — whatever cable would allow connection to the relevant host device/computer — to be plugged into the interface device. The socket's pin arrangement could change as the nature of cables changed. The applicable cables that were known to those trained in the art as of 1998, when Mr. Tasler applied for the '399 Patent, were exhibited to the Court during the tutorial and were physical objects that required physical pin receptors to connect to a device.[16]

A socket is the opposite of a plug; that is, a socket is the "female" end of a connection and a plug is the "male" end. While Figure 2 illustrates sockets with pins that allow cables to connect the host device/computer with the invented interface device, such an arrangement is only a preferred embodiment and its opposite might also be anticipated to comply fully with the invention. Thus, a first connecting device may be either a physical socket or a plug. *See, e.g.*, CMs' *Markman* Br., Ex. D, Am. Heritage Dictionary of Computer and Internet Words 59 (2001) (connector defined as "A coupler used to join two cables or to plug a cable into a port or interface."); *id*., Ex. E, Am. Heritage Dictionary of Computer Words 54 (1995) (same).[17]

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[16] A similar assortment of connectors, although considerably smaller, can be seen on the back and sides of today's laptop computers.

[17] Dictionaries may be consulted at any time to better understand the technology involved in the case. *Vitronics*, 90 F.3d at 1584 n.6. Courts may look to dictionary definitions when construing claim terms, "so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents." *Id*.; *see Phillips*, 415 F.3d at 1321 (cautioning

Papst contends that a first connecting device does not need to be a physical plug or socket because the patented device could use a wireless multi-purpose interface. Tr. 1:159-61 (Papst). Papst confuses "interfacing" and "connecting device." The former concerns "the protocols for the electrical signals and the formatting of the data," Tr. 2:12 (Papst), while the latter is a physical device in these Patents. Accordingly, the Court construes "first connecting device" to mean "a physical socket or plug for permitting a user to attach and detach the interface device to and from a host device/computer."

H.   "second connecting device for interfacing the interface device with the data transmit/receive device"

The parties construe the "second connecting device" in ways that mirror their proposed constructions of the "first connecting device." The Camera Manufacturers propose a "physical plug or socket for permitting a user to readily attach and detach the interface device with a plurality of dissimilar data transmit/receive devices." CMs' Slides at 87. Papst distinguishes between the '399 and '449 Patents in its definition: Papst would define the "second connecting device" in the '449 Patent as "the circuit device used to couple the data transmit/receive device to the interface device." It would construe the same language in the '399 Patent as the structure recited in the Claim, that is, "a sampling circuit for sampling the analog data provided by the data transmit/receive device and an analog-to-digital converter for converting data sampled by the sampling circuit into digital data." Papst App. 3 & 9-10; *see* '399 Patent, col. 12:55-60. Papst contends that the second connecting device in the '399 Patent is a device for sampling and

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that "too often [courts] have condoned the adoption of a dictionary definition entirely divorced from the context of the written description" of the patent.).

converting analog to digital, not a connector.

The second connecting device has multiple purposes: 1) it allows line 16 to be physically attached to the interface device and thus, it is a physical connector, as is the first connecting device. In the preferred embodiment shown in Figure 2, it includes, internal to the interface device, BNC [Bayonet Neill-Conselman] receptors and a sample and hold circuit.

The prosecution history is helpful. As initially presented to the PTO, Claim One of the '399 Patent referred to a second connecting device for interfacing. Tr. 1:185 (CMs). To avoid prior art, Mr. Tasler later amended his patent by inserting the language specifying that the second connecting device included a sampling circuit and an analog to digital converter. '399 File History at 7 (version with markings to show changes). This history indicates that the processing capabilities of the second connecting device, although present and critical in the interface device, do not detract from its fundamental status as a physical connector.

The "second connecting device" itself is a plug or socket that accepts the "output line" 16 and allows the connection to be made between the invented interface device and the data transmit/receive device. The specification states that the second connecting device "can be *attached* by means of an *output line* 16 to a data transmit/receive device which is to receive data from the host device or from which data is to be read, i.e. acquired, and transferred to the host device." '399 Patent, col. 5:56-60 (emphases added); '449 Patent, col. 4:55-59 (same). The specification again refers to physical "attachment" via a "line" when it describes the flexibility of the interface device: "[U]sers of the interface device 10 are able to perform essentially identical operator actions for almost any data transmit/receive devices which can be *attached* to the second connecting device via the *line* 16, thus eliminating a source of error arising from users having to know many different

command codes for different applications." '399 Patent, col. 7:39-43 (emphasis added); '449 Patent, col. 6:39-42 (same). The preferred embodiment of the second connecting device is a BNC input. *See* '399 Patent, col. 9:49-53 ("Preferably, the second connecting device comprises 8 BNC inputs . . . ."); '449 Patent, col. 8:49-53 (same). The specification underscores the physical nature of the second connecting device by referring to the "actual hardware required to attach the interface device 10 to the data transmit/receive device," '399 Patent, col. 8:26-27; '449 Patent, col. 7:26-27, and the "specific hardware symbolized by the second connecting device." '399 Patent, col. 8:34; '449 Patent, col. 7:34.

The Court construes the "second connecting device" in the '399 Patent to mean "a physical plug or socket for permitting a user readily to attach and detach the interface device with a plurality of dissimilar data transmit/receive devices, including a sampling circuit for sampling the analog data provided by the data transmit/receive device and an analog-to-digital converter for converting data sampled by the sampling circuit into digital data." In the '449 Patent, the "second connecting device" means "a physical plug or socket for permitting a user readily to attach and detach the interface device with a plurality of dissimilar data transmit/receive devices."

I. "first command interpreter" and "sends a signal regardless of the type of data transmit/receive device"

These terms are used in the context of the '399 Patent as follows: "the *first command interpreter . . .* , when receiving an inquiry from the host device as to a type of a device attached to the multi-purpose interface of the host device, *sends a signal, regardless of the type of the data transmit/receive device attached* to the second connecting device of the interface device, to the host device which signals to the host device that *it* is an input/output device customary in a host device, whereupon the host device communicates with the interface device by means of the driver for the

input/output device customary in a host device." '399 Patent, col. 12:64-67 & col. 13:1-8 (emphases added).

The Camera Manufacturers would define "first command interpreter" as a "software program for interpreting an inquiry from a host device and sending a signal to the host device in response to the inquiry that 'lies to the host computer as to the real nature of the data transmit/receive device.'" CMs' Slides at 96. They argue:

> Because the first command interpreter is expressed as being "include[d]" in the interface device as a result of "configur[ing]" by the processor and memory, and that it is "configured in such a way" to respond to any inquiry, the first command interpreter must be a software program or module. Then, when receiving an inquiry from the host device, the first command interpreter sends a signal in response, which necessarily requires that it must have interpreted the inquiry to determine what signal to send. This part of the construction appears to be undisputed by Papst. *See* Papst [*Markman*] Br. at 18.

CMs' *Markman* Br. at 18-19. Papst says that "[t]he first command interpreter should be construed to be capable of receiving an 'inquiry' from the computer ('host device'). An 'inquiry' should be construed to mean an instruction seeking information concerning the type of the device attached to a computer." Papst's *Markman* Br. at 18. Papst contends that the phrase "sends a signal . . . to the host device" means that "the signal sent by the first command interpreter in response to the inquiry [is] consistent with a signal that an input/output device customary in a host device would provide in response to that inquiry, and that such [a] response is not based on what data transmit/receive devices may be associated with the interface device." Papst's App. at 3-4.

In its briefs, Papst initially explained, "The patent attorney for the '399 patent argued that the claims were allowable over the cited prior art because, among other things, 'when asked by the host device as to the type of device connected to the interface, [the first command interpreter]

lies to the host computer as to the real nature of the *data transmit/receive device*.'" *Id.* at 19

(emphasis added). In its Reply brief, Papst shifted its position. It now insists that "the CMs

mistakenly argue that the first command interpreter 'lies' to the host computer as to the true nature

of the data transmit/receive device. However, that is not what the claim says . . . . The signal sent

in response to the inquiry identifies the *interface device* as an input/output device customary in a host

device, regardless of what data transmit/receive device may be attached." Papst's Reply at 18

(emphasis added). Disavowing its initial interpretation, Papst argues that it is not necessary for the

invention to lie, *id.*, and then states that, "by identifying itself as an input/output device customary

in a host device, the interface device could be said to 'lie' about the data transmit/receive device

because customary devices (disk drivers, CD-ROMs, etc.) do not have data transmit/receive

devices." *Id.* Papst urges the Court to "give effect to the claims of the patent as finally worded, not

to the remarks of an attorney." *Id.* at 20.

To bring the critical language back to the discussion, Claim One of the '399 Patent

states:

> wherein the first command interpreter is configured in such a way that the
> command interpreter, when receiving an inquiry from the host device as to
> a type of a device *attached to the multi-purpose interface* of the host device,
> sends a signal, *regardless of the type of the data transmit/receive device*
> attached to the second connecting device of the interface device, to the host
> device which signals to the host device that *it* is an input/output device
> customary in a host device, whereupon the host device communicates with
> the interface device by means of the driver for the input/output device
> customary in a host device . . . .

'399 Patent, col. 12:64-67 & col.13:1-8 (emphases added). Since the parties do not dispute that the

first command interpreter is a software program or module that, when receiving an inquiry from the

host device, interprets the inquiry and sends a signal in response, the Court need only construe the

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antecedent of "it" in the sixth line of the quote above.

Papst's Reply argument is correct — the interface device sends a signal that it, the interface device, is an input/output device that can communicate with the computer by way of a driver that is customary in the computer. Notably, it is the interface device itself that is "attached to the multi-purpose interface of the host device." '399 Patent, col. 12:67 & col. 13:1. However, this fact does not fully resolve the issue because both the interface device and the data transmit/receive device can be said to be attached to the computer — by way of the first and second connecting devices. The data transmit/receive device is merely the point of data origin and the computer is merely the point of data destination (or the reverse) along a single continuum effected by the invention. *See id.*, col. 4:60-62 ("The data transmit/receive device itself can also communicative actively with the host device via the first and second connecting device . . . .").

The '399 Patent specification informs how the invention would work. When the interface device is connected between a computer and a data transmit/receive device and the computer is booted up, the normal BIOS routines of the computer issue an INQUIRY instruction. *See id.*, col. 5:2-15. "The digital signal processor 13 in the interface device receives this inquiry instruction via the first connecting device and generates a signal" to the computer. *Id.*, col. 6:10-12. This signal indicates to the computer that, for example, a hard disk drive is attached. *Id.* Upon receiving this response, the computer asks to read the boot sequence of a customary hard disk drive and the interface device's digital signal processor sends a virtual boot sequence. *Id.*, col. 5:19-32. "Once the host device has received this data, *it assumes that the interface device . . . is a hard disk drive.*" *Id.*, col. 5:32-35 (emphasis added); *see also id.*, col. 5:58-59 ("As described above, the interface device appears to the host device as a hard disk" in the preferred embodiment.). While this

description relates most precisely to the preferred embodiment of a hard disk drive, its description

of how the interface device operates provides clarity to define the "it" from the quote above. "It"

must be the interface device and not the data transmit/receive device. Any question about which

device is "it" is further answered by the fact that data does not begin to be sent from the data

transmit/receive device to the interface device until the computer and the interface device have

established communication; only then does the second command interpreter begin "to transfer data

from the data transmit/receive device via the second connecting device" where analog data is

sampled and converted to digital data, then on to "the first connecting device and via the line 11 to

the host device." *Id.*, col. 5:64-67.

In arguing that "it" refers to the data transmit/receive device and not the invented

interface device, the Camera Manufacturers rely on the prosecution history. Mr. Tasler specifically

distinguished the '399 Patent over prior art (the McNeill Patent, U.S. Patent No. 5,499,378), by

stating, "[McNeill] does not include a first command interpreter that . . . lies to the host computer

as to the real nature of the *data transmit/receive device*." '399 File History at 6 (emphasis added).

Mr. Tasler also told the PTO, "[In McNeill,] the initiator asks for a hard disk and the target states

that there is a hard disk" and, unlike the invention, the McNeill device "does not lie as to the *true

type of the data transmit/receive device*." *Id*. (emphasis added). The Claims and specification for

the '399 Patent control, however, with prosecution history a third, but less important, leg to the stool.

"An applicant's inaccurate statement cannot override the claim language itself, which controls the

bounds of the claim." *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 832 (Fed. Cir. 2003).

The Court thus construes "first command interpreter" in the '399 Patent to be "a

software program for interpreting an inquiry from a host device and sending a signal to the host

device in response to the inquiry, which signal tells the host computer that the interface device is an input/output device customary in a host device regardless of the type of transmit/receive device attached to the interface device."

J. "**second command interpreter**"

On reconsideration, Papst asks the Court to change its construction of "second command interpreter." Initially, Papst suggested that the "second command interpreter is capable of receiving a data request command from the host device, and to initiate [sic] the transfer of digital data to the computer." Papst's App. at 4. The Camera Manufacturers proposed to construe "second command interpreter" in the '399 Patent as "a software program for translating data request commands from the host into data transfer commands understandable by a plurality of dissimilar data transmit/receive devices." CMs' *Markman* Br. at 20. Papst objected to defining the second command interpreter as a software program for "translating" data request commands for use by another device. Tr. 2:127 (Papst).

The '399 Patent specification explains that the second command interpreter interprets and decodes commands from the host computer:

> [T]he second command interpreter carries out the read/write assignment to specific functions. If the user now wishes to read data from the data transmit/receive device via the line 16, the host device sends a command, for example "read file xy", to the interface device. As described above, the interface device appears to the host device as a hard disk [in the preferred embodiment]. The second command interpreter of the digital signal processor now *interprets* the read command of the host processor as a data transfer command, *by decoding* whether "xy" denotes, for example, a "real-time input" file, a "configuration" file or an executable file, whereby the same begins to transfer data from the data transmit/receive device via the second connecting device and via the line 11 to the host device.

'399 Patent, col. 6:53-67 (emphases added). Even so, such decoding does not necessarily include

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translating for communication with a data transmit receive device.

Papst now proposes that the Court construe "second command interpreter" in the '399 Patent to mean "a software program for interpreting data request commands from the host device as data transfer commands." Papst's Mot. for Reconsideration [Dkt. # 321] at 6. "Because nothing is being conveyed back up line 16 to the data transmit receive device [as shown on Figure 2], there also is no need for the data request command to be translated into a second command for the data transmit receive device." *Id*. The Court agrees with Papst's construction. "Second command interpreter" in the '399 Patent means "a software program for interpreting data request commands from the host device as data transfer commands."

K. "wherein the interface device is configured by the processor and memory to include a first command interpreter and a second command interpreter"

The Camera Manufacturers propose that the phrase "wherein the interface device is configured by the processor and memory to include a first command interpreter and a second command interpreter" in the '399 Patent means that "the processor of the interface device runs a program from its memory to determine the data transfer parameters of the interface device for the first and second command interpreters." CMs' Slides at 115. The Court will adopt this construction.

After initially proposing no construction for this phrase, at the *Markman* hearing Papst proposed that it be interpreted to mean that "the interface device has first and second command interpreters and that they are implemented by the processor and the memory." Papst's PowerPoint Slides [Dkt. # 244, Ex. A] ("Papst's Slides") at 79; *see* Tr. 2:59 (Papst). Papst contends that the use of the passive voice, in the phrase "the interface device is configured by" does not suggest the active running of a software program. However, even Papst's proposed construction recognizes that the command interpreters are "implemented" by the processor and the memory, implying that the

processor runs a program from its memory.

Papst argues that the Camera Manufacturers' construction would render dependent Claim Eight meaningless, and thus it should be disfavored. *See Cytologix*, 424 F.3d at 1173 (if possible, a court should avoid an interpretation of one claim that renders another meaningless). "[A] claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." 35 U.S.C. § 112. In other words, a dependent claim incorporates all of the limitations of the claim from which it "depends" and adds something new; thus, a dependent claim has a narrower scope than the claim from which it depends. Further, "the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Phillips*, 415 F.3d at 1315. Claim Eight provides:

> An interface device according to claim 7, wherein the virtual files comprise a configuration file in text format which are stored in the memory means and using which the user can configure the interface device for a specific data transmit/receive device.

'399 Patent, col. 13:37-41. Papst contends that because Claim Eight addresses the idea of configuring the interface device, Claim One must not deal with configuring the device. Tr. 2:60 (Papst).

Papst's argument fails. Claim Eight is unrelated to the construction of the "wherein" clause regarding configuration of the interface device to include command interpreters. Claim Eight merely refers to a separate mechanism, "configuration files," that can be used to configure the interface device "on the fly." Tr. 2:65 (CMs). The phrase "[w]herein the interface device is configured by the processor and memory to include a first command interpreter and a second

command interpreter" as used in the '399 Patent means that "the processor of the interface device runs a program from its memory to determine the data transfer parameters of the interface device for the first and second command interpreters."

L. "inquiry" and "inquiring"

Independent Claims One, Eleven, and Fourteen of the '399 Patent and independent Claims One, Seventeen, and Eighteen of the '449 Patent recite that the host device sends an "inquiry" to the interface device to determine the type of device attached to the host device. '399 Patent, col. 12:66 (Claim One), col. 14:6 (Claim Eleven) & col. 14:47 (Claim 14, using the word "inquiring" instead of "inquiry"); '449 Patent, col. 11:61 (Claim One), col. 13:28 (Claim Seventeen) & col. 14:19 (Claim Eighteen, using the word "inquiring" instead of "inquiry"). Papst asserts that "inquiry" should be defined generally to mean "an instruction seeking information concerning the type of the device attached to a computer." Papst's App. at 3. Relying on the specification, the Camera Manufacturers contend that "inquiry" should be defined specifically as "the SCSI inquiry command" and that "inquiring" should be defined as "sending the SCSI inquiry command." CMs' *Markman* Br. at 33.

The specification uses the word "inquiry" as follows:

Preferably, the interface device according to the present invention simulates a hard disk with a root directory whose entries are "virtual" files which can be created for the most varied functions. When the host device system with which the interface device according to the present invention is connected is booted and a data transmit/receive device is also attached to the interface device 10, usual BIOS routines or multi-purpose interface programs issue an instruction, known by those skilled in the art as *the INQUIRY instruction*, to the input/output interfaces in the host device. The digital signal processor 13 receives *this inquiry instruction* via the first connecting device and generates a signal which is sent to the host device (not shown) again via the first connecting device 12 and the host line 11.

> This signal indicates to the host device that, for example, a hard disk drive is attached at the interface to which *the INQUIRY instruction* was sent.

'399 Patent, col. 5:67 & col. 6:1-15 (emphases added); '449 Patent, col. 4:66-67 & 5:1-15 (same). The parties agree that an INQUIRY command, in all capital letters, represents a very specific SCSI command. *See* Tr. 2:78 (Papst) ("[W]hen you're using all capital letters that would be a signal that you're talking about a defined command."); *accord* CMs' Surreply at 21.

The parties disagree regarding the meaning of "inquiry" when lowercase letters are used. The Camera Manufacturers assert that the word "inquiry" in the Claims must mean the SCSI inquiry because when the specification uses the lower case word "inquiry" it says "this inquiry instruction" referring back to the phrase "the INQUIRY instruction." CMs' Slides at 120. Papst would interpret "inquiry" to be broader than a SCSI INQUIRY because the Claims do not state "inquiry" in all capital letters. "[W]hen you are using lower case letters that means you are talking in normal English. In the claims here they're using the lower case version meaning it's generic." Tr. 2:78 (Papst). Papst further explains its position: "I think it's wise to follow the convention of how to use those examples that's [sic] given in the SCSI specification which does draw the distinction between using all caps and the lower case." Tr. 2:101 (Papst).

The distinction between independent and dependent claims supports Papst's construction. As explained above, a dependent claim incorporates all of the limitations of the claim from which it "depends" and adds something new. *See* 35 U.S.C. § 112. Thus, a dependent claim necessarily has a narrower scope than the claim from which it depends. Dependent Claim Four, not in contention here, recites that the multi-purpose interface of the computer is a SCSI interface and that the first connecting device also comprises a SCSI interface. "So that's why the . . . first

command interpreter is not limited to the SCSI command set because that limitation is added by a dependent claim and you get a presumption that there must be some difference" between Claim One and Claim Four. Tr. 2:79 (Papst).

The Camera Manufacturers argue that the specification actually defines the word "inquiry," so that Mr. Tasler acted as his own lexicographer. *See Vitronics*, 90 F.3d at 1582. They go on to argue that this express definition trumps Papst's claim differentiation argument. *See O.I. Corp.*, 115 F.3d at 1583; *see also Hormone Research Found., Inc. v. Genentech, Inc.*, 904 F.2d 1558, 1567 n.15 (Fed. Cir. 1990) (the doctrine of claim differentiation "cannot overshadow the express and contrary intentions of the patent draftsman"). The Camera Manufacturers note that Mr. Tasler knew to state "for example" when merely providing an example. *See* '399 Patent, col. 6:14-16 ("[t]his signal indicates to the host device that, *for example*, a hard disk drive is attached at the interface . . . . ") (emphasis added).

Despite the fact that the specification does not use the words "for example," the context of the paragraph makes it clear that the SCSI INQUIRY is discussed as an example of a preferred embodiment of the invention. The Camera Manufacturers' interpretation takes the phrase "this inquiry instruction" out of context and makes too much of it. The paragraph begins with the word "preferably," indicating that the specification is discussing a preferred embodiment. In the phrase "this inquiry device," the word "this" refers back to the example being discussed, the SCSI INQUIRY. The paragraph does not assert more — it does not say *the* inquiry instruction is the SCSI INQUIRY. The language of the Claims ultimately controls, and the Claims use the lower case term "inquiry." The Court thus construes the term "inquiry" as "an instruction seeking information concerning the type of the device attached to a computer" and the term "inquiring" as "sending an

instruction seeking information concerning the type of the device attached to a computer."

M. "the driver"

The term "driver" is recited in Claims One, Two, Eleven, Fourteen, and Fifteen of the '399 Patent: in Claim One, the host device "comprises drivers for input/output devices customary in a host device," col. 12:43-44; in Claim Two, "the drivers for input/output drivers customary in a host device comprise a hard disk driver," col. 13:14-15; in Claim Eleven, the host device "comprises a multi-purpose interface and a specific driver for this interface," col. 13:52-53, and "the host device communicates with the interface device by means of the specific driver for the multi-purpose interface," col. 14:13-15; in Claim Fourteen, the host device "comprises drivers for input/output devices customary in a host device," col. 14:32-33, and "the host device communicates with the interface device by means of the usual driver for the input/output device" customary in a host device, col. 14:55-57; and in Claim Fifteen, "the drivers for input/output devices customary in a host device comprise a driver for a storage device and in particular for a hard disk drive," col. 14: 63-65. The '449 Patent references "driver(s)" multiple times as well: in Claim One, the host device "comprises drivers for input/output devices customary in a host device," col. 11:47-48; in Claim Seventeen, the host device "comprises a multi-purpose interface and a specific driver for this interface," col. 13:15-16, and "the host device communicates with the interface device by means of the specific driver for the multi-purpose interface," col. 14:1-3; and, in Claim Eighteen, the host device "comprises drivers for input/output devices customary in a host device," col. 14:9-10.

The Camera Manufacturers propose that the word "driver" be construed to mean "the set of software routines used to control an input/output device." CMs' *Markman* Br. at 24. They note the IEEE Dictionary definition for driver "as a computer program, *i.e.*, a set of software routines

that controls a peripheral device and reformats data for transfer to and from the device." *Id.*, *see* The

New IEEE Standard Dictionary of Electrical & Electronics Terms 387 (5th ed. 1993) ("New IEEE

Dictionary") (attached to CMs' *Markman* Br. as Ex. G). According to the Camera Manufacturers,

"the driver must be what actually enables the host device to communicate with and control an

input/output device." CMs' *Markman* Br. at 25.

Papst disagrees, noting that not all IEEE definitions for the word "driver" contain the

word "control" because "control is possible but not necessary." Papst's Reply at 26. Papst urges

the Court to consider the definition offered by its expert, Dr. Locke: "A driver translates generic

commands (such as to 'read' or 'write' a file) from high level computer programs into a sequence

of very specific commands that a particular hardware device can understand (such as 'seek' or 'load

register).'" *Id.* at 27.

As the Court explained above in the discussion of "host device," drivers are software

programs used to communicate with hardware:

> [T]he host device must have internal drivers, *i.e.*, software, to instruct
> hardware how to operate. As Papst acknowledged, drivers "are the
> software programs that are used by the computer[] to communicate
> with the hardware that's attached to the computer. So for each and
> every hardware device that you connect to a computer there has to be
> a driver that allows the computer to communicate with that hardware
> device." Tr. 1:5 (Papst). The specification explains that such drivers
> can instruct a hard drive (the preferred embodiment) that is internal
> to the computer, or such drivers can instruct a printer that is external
> to the computer. In all instances, the driver instructs the how and
> when of hardware operation and thus directs it.

See supra section III.B. of this Opinion.

In addition, the specification makes it clear that a driver is a set of routines required

to drive a device. *See* '399 Patent, col. 12:14-16 ("*using a driver software for the multi-purpose

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interface which comprises the BIOS routines customary in host device"); '449 Patent, col. 11:16-18

(same); *see also* '399 Patent, col. 11:32-42 (the hardware-oriented side of the "ASPI manager" is

matched to an interface and the other side is the user software side); '449 Patent, col. 10:32-42

(same). Accordingly, the Court construes "driver" to mean "the set of software routines used to

direct a device, for example, an input/output device or a multi-purpose interface."

N. "an input/output [storage] device customary in a host device" and
O. "the driver for the input/output [storage] device customary in a host device"

> Claim One of the '399 Patent recites:
>
> wherein the first command interpreter is configured in such a way that
> the command interpreter, when receiving an inquiry from the host
> device as to a type of a device attached to the multi-purpose interface
> of the host device, sends a signal, regardless of the type of the data
> transmit/receive device attached to the second connecting device of
> the interface device, to the host device which signals to the host
> device that it is *an input/output device customary in a host device*,
> whereupon the host device communicates with the interface device
> by means of *the driver for the input/output device customary in a host
> device . . . .*

'399 Patent, col. 12:64-67 & col. 13:1-8 (emphases added).[18]

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[18] For purposes of construing the contested meaning here, the differences between the '399
Patent and the '449 Patent are not relevant. The '449 Patent states:

> *wherein the interface device is configured by the processor and the memory*
> *in such a way that the interface device*, when receiving an inquiry from the
> host device as to the type of a device attached to the multi-purpose interface
> of the host device, sends a signal, regardless of the type of the data
> transmit/receive device attached to the second connecting device of the
> interface device, to the host device which signals to the host device that it
> is a *storage* device customary in a host device, whereupon the host device
> communicates with the interface device by means of the driver for the
> *storage* device customary in a host device . . . .

'449 Patent, col. 11:59-67 & col. 12:1-3 (emphases added to identify words not present in the '399
Patent). For clarity, the Court omits reference to the "storage device" in the '449 Patent in the

Claim One first states that the interface device sends a signal to the computer that it is "an input/output device customary in a host device" and then that the computer communicates by means of the "driver for the input/output device customary in a host device." *Id.* The parties agree that the "input/output device" must be "customary in a host device." But they disagree about what "customary in a host device" means and about whether the adjectival phrase "customary in a host device" modifies "driver." The Camera Manufacturers contend that the phrase modifies both — "an input/output device customary in a host device" means a "data input/output [ ] that was normally present within the chassis of most commercially available computers at the time of the invention," Tr. 2:85 (CMs), and "the driver for the input/output device customary in a host device" means "the driver normally present in most commercially available computers at the time of the invention." CMs' *Markman* Br. at 26.

According to Papst, the phrase "customary in a host device" modifies "input/output device" and not "driver." Papst's Reply at 24-25; Papst's Slides at 105. Papst asserts that the phrase "an input/output device customary in a host device" means "a hardware device that inputs or outputs data with respect to a host computer, and is a device that is sufficiently common such that software drivers for communicating with the input/output device are typically provided with the host computer as it is purchased. Input/output devices customary in a host device include, for example, hard disk drives, floppy disk drives, CD-ROM drives, tape drives or printers." Papst's App. at 4. Papst proposes that "the driver for the input/output device customary in a host device" should be construed in context to mean "upon receiving the 'signal,' the host device automatically uses one or more software driver for use with the customary input/output devices to communicate with the

remainder of this discussion.

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interface device." *Id*.

The phrase "customary in a host device" raises three questions: (1) what does "customary" mean?; (2) "customary" as of when?; and (3) what does "in" a host device mean? Tr. 2:85 (CMs). First, the specification expressly defines "customary" as "normally present in most commercially available host devices" as follows:

> The present invention is based on the finding that both a high data transfer rate and host device-independent use can be achieved if a driver for an input/output device customary in a host device, normally present in most commercially available host devices, is utilized. Drivers for input/output devices customary in a host device which are found in practically all host devices are, for example, drivers for hard disks, for graphics devices or for printer devices.

'399 Patent, col. 4:23-27; '449 Patent, col. 3:27-31. When a specification expressly defines a term, as it does here, it acts as a dictionary. *See Vitronics*, 90 F.3d at 1582. Accordingly, "customary" means "normally present in most commercially available host devices."

The next question — customary as of when? — must be answered: as of 1998 when Mr. Tasler applied for the '399 Patent. A court must interpret the words of a contested claim from the perspective of one skilled in the art at the time of invention. *See Phillips*, 415 F.3d at 1313. The word "customary" is time-dependent, like the word "conventional" construed by the court in *Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1326 (Fed. Cir. 2008). There, the court determined that "conventional" when modifying the term "internet browser" meant web browsers in existence at the time of the invention. *See id*.; *accord PC Connector Solutions LLC v. SmartDisk Corp.*, 406 F.3d 1359, 1363-64 (Fed. Cir. 2005) (input/output port "normally" connectible to a computer port meant technology existing at the time of the invention). A claim cannot be interpreted to have different meanings at different times. *See PC Connector*, 406 F.3d at 1363. The word

"customary" means customary in a host computer at the time of the invention.[19]

With regard to the third question — what does "in" a host device mean? — the answer is straightforward in the context of the phrase "the driver for the input/output device customary in a host device." The Camera Manufacturers assert that "in" means "in," that is, within the chassis of the host computer. Tr. 2:86 (CMs). The specification makes it clear that certain "drivers" are "normally present in most commercially available host devices," *i.e.*, are normally *inside* most computers:

> The present invention is based on the finding that both a high data transfer rate and host device-independent use can be achieved if *a driver for an input/output device customary in a host device, normally present in most commercially available host devices*, is utilized. *Drivers* for input/output devices customary in a host device *which are found in practically all host devices are, for example, drivers for hard disks, for graphics devices or for printer devices.* . . . [T]he hard disk driver is utilized in the preferred embodiment of the interface device of the present invention. Drivers for other storage devices such as floppy disk drives, CD-ROM drives or tape drives could also be utilized in order to implement the interface device according to the present invention.

'399 Patent, col. 4:23-39 (emphases added); '449 Patent, col. 3:26-43 (same).   As the specification further explains, the interface device sends a signal to the computer that the computer is communicating with an input/output device, and the interface device then communicates with the computer using either a driver present in the computer's BIOS system or a specific driver for the multi-purpose interface. *See* '399 Patent, col. 5:5-20; '449 Patent, col. 4:9-24.

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[19] The Camera Manufacturers argue that Papst conceded that customary is a time-dependent term. Tr. 2:86 (CMs) ("Mr. Kuwala said this very morning that customary is a time dependent term and therefore, it has to be customary at the time of the invention."). Papst did not concede this issue, however. It merely noted that you "might argue" that the word "customary" imposes a time limitation. Tr. 2:41 (Papst).

The interface device according to the present invention therefore simulates, both in terms of hardware and software, the way in which a conventional input/output device functions, preferably that of a hard disk drive. As support for hard disks is implemented as standard in all commercially available host systems, the simulation of a hard disk, for example, can provide host device-independent use. The interface device according to the present invention therefore no longer communicates with the host device or computer by means of a specially designed driver but by means of a program which is present in the BIOS system (Basic Input/Output System) and is normally precisely matched to the specific computer system on which it is installed, or by means of a specific program for the multi-purpose interface.

'399 Patent, col. 5:5-20; '449 Patent, col. 4:9-24 (same). Thus, what is "in" the computer are the drivers for internal computer components (such as the multi-purpose interface or an internal hard disk drive) and for various peripherals, some of which are always outside the computer such as printers.

The Patent requires "drivers" to be "customary." Again, the parties agree that the "input/output device" must be "customary in a host device." Since every input/output device has its own driver, for every input/output device that is "customary" there must also be a driver that is "customary." This explains the statement in the specification that "[d]rivers for I/O devices customary in a host device which are found in practically all host devices are, for example, drivers for hard disks, for graphics devices or for printer devices." '399 Patent, col. 4:27-30; '449 Patent, col. 3:31-34. Because all input/output devices must have individual drivers to function, and because Mr. Tasler referenced "customary input/output devices," the Court concludes that when he also referenced "drivers for the input/output device customary in a host device," he meant that such drivers themselves must be customary in a host device.

The question — what does "in" a host device mean? — is more difficult in the

context of the phrase "an input/output device customary in a host device." The Camera Manufacturers again assert that "in" means "within the chassis of the host computer." CMs' *Markman* Br. 29. Papst suggests that an input/output device "in" a computer should be construed more broadly to mean "with respect to," as in "a hardware device that inputs or outputs data with respect to a host computer." Papst's App. at 4. "We don't read in as requiring it to be inside. It means part of the system." Tr. 2:80 (Papst).

The parties' conflicting interpretations arise from the garbled language of the Claims. The specification clarifies that drivers must be internal to the host device: "[d]rivers for I/O devices customary in a host device which are found in practically all host devices." '399 Patent, col. 4:27-30; '449 Patent, col. 3:31-34. But in describing such drivers, the specification refers to drivers for printers. The parties agree that printers are not inside a computer. Tr. 2:80 (Papst); Tr. 2:87 (CMs).

The specification expressly defines "drivers customary in a host device" in relation to the devices that such drivers direct. Those devices described are both inside and outside a computer. However, the interface device "signals to the host device that it is an input/output device customary in a host device." The phrase "customary in a host device" refers to the immediately antecedent noun "device;" there is no other antecedent word that the phrase reasonably could modify. Thus, the input/output must be "customary in a computer." And the word "in" should be construed in accordance with its ordinary meaning to mean "within," not "with respect to" as Papst proposes. Papst's construction ignores the word "in," rendering it superfluous, and such a construction is disfavored. *See Merck*, 395 F.3d at 1372 (a construction that gives meaning to all the terms of the claim is preferred over one that does not). Papst's assertion — that the Patent must mean input/output devices customary in a *computer system* because the specification refers to drivers for

devices both inside and outside the chassis of the computer — might be what the inventor meant to say when he wrote his Patent. But the Patent does not say that the interface device "signals to the host device that it is an input/output device *for which the host device has drivers that are* customary in a host device." The Court must construe the claims of the Patent as they are written.

Accordingly, the Court finds that "an input/output device customary in a host device" must be construed similarly to the phrase "the driver for the input/output device customary in a host device." "An input/output device customary in a host device" in the '399 Patent means a "data input/output device that was normally present within the chassis of most commercially available computers at the time of the invention," and "the driver for the input/output device customary in a host device" means "the customary driver(s) in a host device used to communicate with customary internal and external input/output device(s), which driver(s) were normally present within the chassis of most commercially available computers at the time of the invention." Thus, "a storage device customary in a host device" in the '449 Patent means a "storage device that was normally present within the chassis of most commercially available computers at the time of the invention," and "the driver for the storage device customary in a host device" means "the customary driver(s) in a host device used to communicate with customary internal and external storage device(s), which driver(s) were normally present within the chassis of most commercially available computers at the time of the invention."

P. "the usual driver for the input/output [storage] device"

Claim Fourteen of the '399 Patent and Claim Eighteen of the '449 Patent both use the phrase "the usual driver for the input/output [storage] device" as follows:

> regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, responding to

the inquiry from the host device by the interface device in such a way that it is an input/output device customary in a host device, *whereupon the host device communicates with the interface device by means of the usual driver for the input/output device . . . .*

'399 Patent, col. 14:51-57 (emphasis added); '449 Patent, col. 14:22-28 (same, but referring to a storage device and not an input/output device). The Camera Manufacturers assert that the phrase is indefinite because it has no antecedent basis, but to the extent that the phrase can be construed, it should be construed to mean the driver normally present in most commercially available computers at the time of the invention. Papst contends that "usual" modifies "input/output device" or "storage device" and not the term "driver." Thus, Papst seeks to construe the phrase as "a software driver that is normally used by the computer to communicate with the customary hardware device." Papst's proposal fails to follow the English language. The analysis is the same as the analysis of the phrase "the driver for the input/output [storage] device customary in a host device" discussed above.   In Claim Fourteen of the '399 Patent, the phrase "the usual driver for the input/output device" means "the customary driver(s) in a host device used to communicate with customary internal and external input/output device(s), which driver(s) were normally present within the chassis of most commercially available computers at the time of the invention." In Claim Eighteen of the '449 Patent, the phrase "the usual driver for the storage device" means "the customary driver(s) in a host device used to communicate with customary internal and external storage device(s), which driver(s) were normally present within the chassis of most commercially available computers at the time of the invention."

Q. "whereupon the host device communicates with the interface device by means of the driver for the input/output [storage] device customary in a host device"

The Camera Manufacturers correctly point out that this phrase "whereupon the host

device communicates with the interface device by means of the driver for the input/output [storage] device customary in a host device" does not need to be construed separately from its constituent claim terms, which have already been construed.

Papst suggests that the phrase be interpreted to mean that "upon receiving the signal, the host device automatically uses one or more software drivers developed for use with the customary input/output [storage] devices to communicate with the interface device." Papst's App. at 4. This construction uses the word "automatically," thereby inserting a limitation not present in the Patents. Because there is no intrinsic evidence that supports this limitation, the Court will not adopt Papst's proposal. The phrase does not need to be construed separately from its component words and phrases, which the Court already has construed.

R. "the digital data"

The phrase "the digital data" comes from the very last phrase of Claim One of the '399 Patent, which states: "wherein the second command interpreter is configured to interpret a data request command from the host device to the type of input/output device signaled by the first command interpreter as a data transfer command for initiating a transfer of the digital data to the host device." '399 Patent, col. 13:8-12. The Camera Manufacturers note the antecedent reference to "the digital data" — "the second connecting device including a sampling circuit for sampling the analog data provided by the data transmit/receive device and an analog-to-digital converter for converting data sampled by the sampling circuit into *digital data*." *Id.*, col. 12:55-59 (emphasis added). From these two references, they suggest that "the digital data" should be construed to mean "the same digital data output from the analog to digital converter, unmodified by additional processing." CMs' Surreply at 21. Papst offers a more expansive definition, to wit, "the 'digital data,' while referring

to the data digitized in the second connecting device, includes data that has undergone further processing, such as digital signal processing." Papst's Slides at 112; *see* Papst's App. at 4; '399 Patent, col. 13:26-27 (Claim Five, reciting that the processor is a digital signal processor). When the specification describes the preferred embodiment of the invention, it describes the processing by the interface device of the data acquired from the transmit/receive device — "the digital signal processor implements a fast Fourier transformation (FFT) in real time and also optional data compression of the data to be transferred from the data transmit/receive device to the host device." *Id.*, col. 9:24-26. Papst has the better approach.

The specification for the '399 Patent states that in the preferred embodiment "[t]he digital signal processor 1300 provides on-board digital data processing." '399 Patent, col. 10:56-57 (the number 1300 refers to the location of the processor on Figure 2). Such digital signal processing is only limited by the size of the memory, as the specification explains:

> As a result of the option of storing any files in agreed formats in the memory means 14 of the interface device 10, taking into account the maximum capacity of the memory means, any enhancements or even completely new functions of the interface device 10 can be quickly implemented. Even files executable by the host device, such as batch files or executable files (BAT or EXE files), and also help files can be implemented in the interface device . . . .

'399 Patent, col. 7:49-54; s*ee also id*., col. 8:37-42 ("Further, an experienced user can intervene at any time on any level of the existing second connecting device by making use of the above mentioned option of creating a configuration file or adding or storing new program sections for the second connecting device."). Thus, "the digital data" means "the data as it is output by the analog to digital converter, and/or the data as it is output by the analog to digital converter after it has undergone additional processing, such as digital signal processing."

S. buffer terms — "memory means comprising a buffer to buffer data to be transferred between the data transmit/receive device and the host device" and "a data buffer for permitting independence in terms of time of the data transmit/receive device attachable to the second connecting device from the host device attachable to the first connecting device"

Dependent Claim Three of the '399 Patent provides, "[a]n interface device according to claim 1, wherein *the memory means comprises a buffer* to buffer data[20] to be transferred between the data transmit/receive device and the host device." '399 Patent, col. 13:18-21 (emphasis added). Dependent Claim Sixteen of the '449 Patent provides, "[a]n interface device in accordance with claim 1 wherein *the memory has a data buffer* for permitting independence in terms of time of the data transmit/receive device attachable to the second connecting device from the host device attachable to the first connecting device." '449 Patent, col. 13:9-13 (emphasis added).

The Camera Manufacturers define "a buffer to buffer data" and "a data buffer" as volatile memory used to temporarily store data to compensate for differences between the rate in the flow of data between the data transmit/receive device and the host device. Papst proposes that "memory means comprising a buffer" is memory adapted to store the data gathered by the transmit/receive device until it is transferred to the computer, thus allowing time independence in terms of when the data is acquired and when the data is later transferred to a host computer.

Under Papst's construction, the data could be stored indefinitely. In essence, Papst asserts that a buffer can be temporary or semi-permanent memory; it could be non-volatile EEPROM[21] memory. Tr. 3:70. This definition would make the term "buffer" indistinguishable from the term "memory" in Claim One of the Patents, giving Claim Three of the '399 Patent and Claim

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[20] The parties agree that "a buffer to buffer data" means a buffer to accomplish the task of buffering. Tr. 3:64 (Papst & CMs) .

[21] EEPROM is electrically erasable programable read only memory.

Sixteen of the '449 Patent the same scope as Claim One — a violation of the doctrine of claim differentiation. As explained previously, a dependent claim references a prior claim and specifies a further limitation. *See* 35 U.S.C. § 112. The presence of a dependent claim creates a presumption that the limitation set forth in the dependent claim is not present in the independent claim. *See Phillips*, 415 F.3d at 1315.[22]

The ordinary meaning of the term "buffer" is a "temporary memory for data, normally used to accommodate the difference in the rate at which two devices can handle data during a transfer." Oxford Dictionary of Computing 55 (4th ed. 1996) (attached to CMs' *Markman* Br. as Ex. O). Thus, a buffer is temporary. *See id.* (a buffer is "temporary memory" used "during transfer.") A buffer is used to synchronize the transfer of data between two devices to accommodate the difference in the rate at which one device can transfer data and the other can receive the data.

> [Buffering is a] programming technique used to compensate for the slow and possibly erratic rate at which a peripheral device produces or consumes data. If the device communicates directly with the program, the program is constrained to run in synchronism with the device; buffering allows program and device to operate independently. Consider a program sending output to a slow device. A memory area (the buffer) is set aside for communication: the program places data in the buffer at its own rate, while the device takes data from the buffer at its own rate. Although the device may be slow, the program does not have to stop unless the buffer fills up; at the same time the device runs at full speed unless the buffer empties.

Id.; *see also* The IEEE Standard Dictionary of Electrical and Electronic Terms 113 (6th ed. 1996) (attached to Papst's Reply as Ex. F, corrected copy filed at Dkt. # 270) (a buffer is "[a] device in

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[22] Papst asserts vaguely that the claim differentiation doctrine is not violated because Claim Three "further defines memory." Papst's Reply at 33. Because Papst does not explain *how* it further defines memory, the Court does not credit this vague assertion.

which data are stored temporarily, in the course of transmission from one point to another; used to compensate for a difference in the flow of data, or time of occurrence of events, when transmitting data from one device to another").

The buffer is described in the specification: "the memory means can have an additional buffer for purposes of synchronizing data transfer from the data transmit/receive device to the interface device and data transfer from the interface device to the host device. Preferably, the buffer is implemented as a fast random access memory or RAM buffer." '399 Patent, col. 7:26-31; '449 Patent, col. 6:26-31; *see also* '399 Patent, col. 10:17-20 (under the preferred embodiment a "random access memory . . . serves as a data buffer to achieve independence in terms of time of the output line 16 from the output lines 11a, 11b, and 11c to the data transmit receive device and to the host device respectively"); '449 Patent, col. 9:17-20 (same). The buffer in the interface device is used in the way ordinary buffers are — for "synchronizing data transfer from the data transmit/receive device to the interface device 10 and data transfer form the interface device 10 to the host device." '399 Patent, col. 7:26-29; '449 Patent, col. 6:27-29.

Papst points out that the specification explains that a "buffer can be implemented in the memory means 14 to permit independence in terms of time." '399 Patent, col. 9:8-12; '449 Patent, col. 8:8-12. But this statement must be read in context. It comes from a description of a preferred embodiment of the invention, specifically a buffer implemented by a random access memory. The specification describes an ongoing process of data transfer, not the storage of data separated by days, weeks, or months from the time of its transfer as Papst suggests. The Court construes "a buffer" (for buffering data) and "a data buffer" as "memory used to store data temporarily to compensate for differences between the rate in the flow of data between the data

transmit/receive device and the host device."

T. "virtual files"

Claim Seven of the '399 Patent provides, "An interface device according to claim 2, which further comprises a root directory and virtual files which are present on the signaled hard disk drive and which can be accessed from the host device." '399 Patent, col. 13:33-36. Papst defines "virtual files" based on the type of media on which such files are stored as meaning "files which appear to be present on an emulated disk drive, yet which are not actually on a rotating disk." Papst's App. at 5. The Camera Manufacturers offer instead that a "virtual file" is "a file that does not physically exist as a file in the interface device but appears to the host device to be an actual file, and references data to be transmitted between the data transmit/receive device and the host device." CMs' *Markman* Br. at 38.

Claim Seven depends from Claim Two; under Claim Two, the interface device signals to the host device/computer that the interface device is a hard disk. *See* '399 Patent, col. 13:33 & 13-17. The "signaled hard disk drive" in Claim Seven refers back to the signal first mentioned in Claim Two. That signaled hard disk drive, which does not exist in fact, "further comprises a root directory and virtual files," *id.*, col. 13:34, which also do not exist in fact.

The 1993 New IEEE Dictionary defined the term similarly to the construction proposed by the Camera Manufacturers. In the context of a "virtual record," "virtual" was defined as: "a record that appears to be but is not physically stored; rather, it is constructed or derived from existing data when its contents are requested by an application program." New IEEE Dictionary at 1461 (attached to CMs' *Markman* Br. as Ex. G); *see also* Oxford English Dictionary at 674 (2d ed. 1989) (defining "virtual" in the context of computers to mean "not physically existing as such but

made by software to appear to do so from the point of view of the program or the user") (attached to CMs' *Markman* Br. as Ex. P). The '399 Patent and the specification do not indicate that Mr. Tasler used the term "virtual file" in any unique way, such as that proposed by Papst, and the Court construes the term to have its ordinary meaning.

Papst argues that if one interprets "virtual file" to mean "a file that does not physically exist as such but is made by software to appear to do so from the point of view of the program or the user," Claim Seven would be inconsistent with Claims Eight, Nine, and Ten which, Papst asserts, cover "virtual files that are actually stored in the interface device." Papst's Reply at 35. Papst mis-reads these Claims. Each says, "wherein the virtual files comprise" a configuration file "stored in the memory means," '399 Patent, col. 13:38 (Claim Eight); batch files or executable files for the microprocessor "stored in the interface device," *id.*, col. 13:43-44 (Claim Nine); and batch files or executable files for the host device "stored in the interface device." *Id.,* col:13:48-49 (Claim Ten).

The Court perceives no conflict among the Claims. Virtual files that are "stored in the memory means" or "stored in the interface device" are no less virtual for that reason. Under Claims Eight, Nine, and Ten, what is "stored" are software instructions in the interface device which instruct the interface device to present data as if in real files of the types described, but which files are, in actuality, non-existent. The Court adopts the definition from the New IEEE Dictionary as the most clear and pertinent: "virtual files" in Claim Seven of the '399 Patent means "files that appear to be but are not physically stored; rather, they are constructed or derived from existing data when their contents are requested by an application program so that they appear to exist as files from the point of view of the host device."

U. "simulating a virtual file system"

The phrase "simulating a virtual file system" is found in Claim One of the '449 Patent as follows: "wherein the interface device is arranged for simulating a virtual file system to the host, the virtual file system including a directory structure." '449 Patent, col. 12:4-6; s*ee also id.*, col. 14:4-7 (Claim Seventeen) ("the virtual file system including a file allocation table and a directory structure"); *id.*, col. 14:29-32 (Claim Eighteen) (same). The phrase might be thought a bit circuitous, in that a virtual file is already a simulated file. *See* Tr. 3:119 (Papst) ("[T]his is unusual language. It probably wouldn't have been my first choice . . . ."). With the additional word "system," however, the phrase can be readily construed.

As Claims One, Seventeen, and Eighteen of the '449 Patent make clear, the Patent covers a virtual system of files, with a virtual directory structure. *See* '449 Patent, col. 12:6. Dependent Claim Two identifies additional types of virtual files which could be in the virtual system referenced in Claim One: a virtual configuration file, a virtual executable or batch file, or a virtual data file. *See id.*, col. 12:8-12; *see also id.* col. 12:27-28 (Claim Seven) (referencing a "virtual boot sequence"). A "virtual file system," such as that described in the '449 Patent, is one that is "not physically existing as such but made by software to appear to do so." Oxford English Dictionary at 674 (defining "virtual" in the context of computers) (attached to CMs' *Markman* Br. as Ex. P); *accord* New IEEE Dictionary at 1461 ("virtual record" is a record that "appears to be but is not physically stored") (attached to CMs' *Markman* Br. as Ex. G). The Court construes "simulating a virtual file system" to mean "appearing to be a system of files, including a directory structure, that is not physically stored; rather, it is constructed or derived from existing data when its contents are requested by an application program so that it appears to exist as a system of files from the point of

view of the host device."

V. "specific driver for the multi-purpose interface"

Claim Eleven of the '399 Patent states:

wherein the first command interpreter is configured in such a way that the command interpreter, when receiving an inquiry from the host device as to a type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is an input/output device customary in a host device, whereupon the host device communicates with the interface device by means of *the specific driver for the multi-purpose interface . . . .*

'399 Patent, col. 14:4-15 (emphasis added). Claim Seventeen of the '449 Patent cites the same

phrase as:

wherein the interface device is configured using the processor and the memory in such a way that the interface device, when receiving an inquiry from the host device as to a type of a device attached to the multi-purpose interface of the host device, sends a signal, regardless of the type of the data transmit/receive device attached to the second connecting device of the interface device, to the host device which signals to the host device that it is a storage device customary in a host device, whereupon the host device communicates with the interface device by means of *the specific driver for the multi-purpose interface . . . .*

'449 Patent, col. 13:26-34 & col. 14:1-3 (emphasis added).

The Camera Manufacturers contend that "the specific driver for the multi-purpose

interface" means the set of software routines that control the multi-purpose interface that are

developed for the particular multi-purpose interface. CMs' Slides at 240. Ignoring the word

"specific," Papst asserts that this means a driver for the multi-purpose interface, *i.e.*, a software

driver that enables a host system to communicate via a multi-purpose interface. Papst's App. at 5.

The specification explains why the word "specific" is used in these Claims:

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[C]ommunication between the host device and the multi-purpose interface can take place not only via drivers for input/output devices customary in a host device which reside in the BIOS system of the host device but also *via specific interface drivers* which, in the case of SCSI interfaces, are known as multi-purpose interface ASPI (advanced SCSI programming interface) drivers. This ASPI driver, which can also be referred to as an ASPI manager, is specific to a special SCSI host adapter, i.e. to a special multi-purpose interface, and is normally included by the manufacturer of the multi-purpose interface.

'399 Patent, col. 11:9-19; '449 Patent, col. 10:9-19.

Papst's construction ignores the term "specific." Because the Court should avoid interpreting the Claims in a way that renders any term superfluous, *see Merck*, 395 F.3d at 1372, the Court will not adopt Papst's proposal. "Specific driver for the multi-purpose interface" is deemed to mean "the set of software routines that control the multi-purpose interface and that are developed for the particular multi-purpose interface."

W. "digital signal processor"

Claim Five of the '399 Patent provides, "An interface device according to claim 1, wherein the processor is a digital signal processor." '399 Patent, col. 13:26-27. Papst asserts that a "digital signal processor" means a "processor with a highly parallel, pipeline architecture optimized to perform repetitive operations." Papst's App. at 5.[23] The Camera Manufacturers contend that a digital signal processor is simply a processor — any kind of microprocessor — including a digital signal processor. *See* CMs' Slides at 248.

Papst is correct that the "digital signal processor" in Claim Five cannot be any kind

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[23] Neither party presented any argument at the hearing on the definition of "digital signal processor." Tr. 3:134 (Papst) ("[W]e don't have any further presentation on digital signal processor in Claim 5.")

of microprocessor. Claim Five is a dependent claim. Thus, it includes the limitations of Claim One, but also adds something new, rendering it more narrow than Claim One. *See* 35 U.S.C. § 112; Tr. 3:38. Claim One is broad. It recites that interface device includes a "processor." '399 Patent, col. 12:48. The specification expressly notes that while a preferred embodiment would include a digital signal processor, it could include any type of processor: "In a preferred embodiment of the present invention, the digital signal processor 13, *which need not necessarily be implemented as a digital signal processor but may be any other kind of microprocessor . . . .*" '399 Patent, col. 6:48-51 (emphasis added); *see also id.*, col. 9:18-19 ("[T]he DSP can be any DSP"). Because "processor" in Claim One means any kind of processor, the term "processor" in Claim Five must be more limited. *See* 35 U.S.C. § 112 ("[A] claim in dependent form shall . . . specify a further limitation of the subject matter claimed."). To interpret Claim Five as coextensive with Claim One would render Claim Five meaningless. Such a construction is disfavored. *See Cytologix*, 424 F.3d at 1173. The Court adopts, with some modification, Papst's proposed construction: a "digital signal processor" as specified in Claim Five of the '399 Patent means a "processor optimized to perform repetitive computations used in digital signal processing such as multiply-accumulates."

X. "memory"

Papst asserts that the term "memory" as used in Claim One of both the '399 and the '449 Patents should be construed by the Court and that the term means "any type of semiconductor memory such as EPROM, EEPROM, and RAM,"[24] Papst's App. at 2, as these are examples given

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[24] RAM is volatile memory; EPROM and EEPROM are non-volatile memory. Tr. 3:138 (Papst). ROM in EPROM and EEPROM is read only memory. Tr. 3:142 (CMs). The specification explains that the non-volatile memory in the interface device is used for storing instructions like the operating system. *See* '399 Patent, col. 7:23-26 ("In addition to the digital signal processor instruction memory, which comprises the operating system of the digital signal processor and can

in the Patents. *See, e.g.*, '399 Patent, col. 7:23-25 ("In addition to the digital signal processor memory, which comprises the operating system of the digital signal processor and can be implemented as an EPROM or EEPROM"); '449 Patent, col. 6:23-26 (same); '399 Patent, col. 10:14-15 ("In FIG. 2, the memory means 14 of FIG. 1 is implemented by an EPROM"); '449 Patent, col. 9:14-15 (same); '399 Patent, col. 9:18-20 ("[T]he DSP can be any DSP but preferably has a 20-MB on-chip random access memory (RAM)"); '449 Patent, col. 8:18-21 (same). The Camera Manufacturers contend that the term need not be construed but if the Court decides to do so, the term should be interpreted broadly to mean "any type of memory," which could include a hard drive. CMs' Slides at 245.

The key difference between the parties' proposed definitions is whether the term "memory" can include a hard drive. The Camera Manufacturers agree with Papst that the inventor did not disclose an actual hard drive as part of the interface device, Tr. 3:141 (CMs), but they insist that the term "memory" is broad and could include a hard drive. Papst's proposed definition necessarily excludes a hard drive because a hard drive is electro-mechanical (and not semiconductor) and Papst's proposed definition is "any type of semiconductor memory." Papst's App. at 2.

Papst further argues that "memory" is not used in the Patents to mean a storage device, which could include a hard disk drive, and thus memory should be construed to exclude hard drives. The Patent refers to storage devices "such as hard disk drives, tape drives, and floppy drives." Tr. 3:136 (Papst); *accord* '399 Patent, col. 4:36-39 ("Drivers for other storage devices such a floppy disk drives, CD-ROM drives or tape drives could also be utilized."); '449 Patent, col. 3:39-42 (same); *see also* '399 Patent, col. 11:66-67 & col. 12:1-3 ("Using the ASPI manager . . . the

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be implemented as an EPROM or EEPROM, the memory means can have an additional buffer . . . ."); '449 Patent, col. 6:23-27 (same).

present invention can now obtain active access to a[] *SCSI hard disk . . .* which . . . cannot be a

virtual but a real *SCSI mass storage device . . . .*") (emphasis added); '449 Patent, col. 11:1-5 (same).

Papst's construction is strained. Just because the specification refers to storage

devices such as hard drives does not mean that the "memory" cannot include a hard drive. And just

because the specification referred to three types of semiconductor memory does not mean that

"memory" can only include semiconductor memory. The IEEE dictionary definition at the time of

the invention defines "memory" as "Memory (electronic computation). See: storage; storage medium."

New IEEE Dictionary at 797. The IEEE dictionary defines "storage" broadly as:

> Storage (1) (electronic computation).
>
> . . . .
>
> (B) Any device in which information can be stored, sometimes called a memory device.
>
> (C) In a computer, a section used primarily of [sic] storing information. Such a section is sometimes called a memory or store (British).
>
> Notes: (1) the physical means of storing information may be electrostatic, ferroelectric, magnetic, acoustic, optical, chemical, electronic, electric, mechanical, etc., in nature. (2) pertaining to a device in which data can be entered, in which it can be held and from which it can be retrieved at a later date. See store.
>
> (2) (data management). In a computer, one or more bytes that are used to store data.

Id. at 1294-95. Papst's distinction between memory and storage is not reflected in the New IEEE

Dictionary, nor is its distinction between semiconductor memory and other physical means of storing

memory. "Memory" means "any type of memory."

Y. "root directory" and "processor"

Papst also asks the Court to construe the terms "root directory" and "processor." The term "root directory" appears in Claim Seven, which provides:

> An interface device according to claim 2, which further comprises a root directory and virtual files which are present on the signaled hard disk drive and which can be accessed from the host device.

'399 Patent, col. 13:33-36. Claim Seven depends from Claim Two, which provides:

> An interface device according to claim 1, wherein the drivers for input/output drivers customary in a host device comprise a hard disk driver, and the signal indicates to the host device that the host device is communicating with a hard disk.

Id., col. 13:13-17.

The Camera Manufacturers assert that it is not necessary to interpret these terms, but if the Court deems it necessary, they agree to Papst's proposed construction. Tr. 3:82 (CMs). Papst asserts that "root directory" means a directory that is not in another directory. Papst's App. at 5. The specification states, "Preferably, the interface device according to the present invention simulates a hard disk with a root directory whose entries are 'virtual' files which can be created for the most varied functions." '399 Patent, col. 5:67 & col. 6:1-3. And Papst asserts that "processor" should be interpreted to mean any kind of microprocessor, including a digital signal processor. Papst's App. at 2. Because the Camera Manufacturers concede to Papst's construction of these terms, the Court adopts Papst's construction: "root directory" means "a directory that is not in another directory" and "processor" means "any kind of microprocessor, including a digital signal processor."

Z. Claim Two of the '399 Patent

Claim Two of the '399 Patent provides:

An interface device according to claim 1, wherein the drivers for

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input/output drivers customary in a host device comprise a hard disk
driver, and the signal indicates to the host device that the host device
is communicating with a hard disk.

'399 Patent, col. 13:13-17. Papst argues in its Reply that the Court should construe Claim Two of

the '399 Patent, Papst's Reply at 31-32, but did not present any further argument on this issue at the

hearing.[25] The Camera Manufacturers assert that there is no need to construe Claim Two because

it consists of terms already construed in the context of Claim One. There is a presumption that the

same term used in multiple claims has the same meaning. *See Fin Control Sys. Pty*, 265 F.3d at

1318. Because the Court already construed the component terms, it is not necessary to construe

Claim Two.

IV. CONCLUSION

Accordingly, Papst's Motion for Reconsideration will be granted. The June 12, 2009,

Memorandum Opinion and Order [Dkt. ## 312 & 313] will be vacated. The Claims of the Patents

are deemed to have the meanings ascribed to them above. A memorializing Order accompanies this

Memorandum Opinion.

Date: November 24, 2009   _____/s/_____
                                                ROSEMARY M. COLLYER
                                                United States District Judge

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[25] Tr. 3:134 (Papst) ([W]e're considering whether or not to present further argument on hard disk drive which is in Claim 2"). None was presented.