

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANON INC., CANON U.S.A., INC.,
CANON FINANCIAL SERVICES, INC., FUJIFILM CORPORATION,
FUJIFILM HOLDINGS AMERICA CORPORATION,
FUJIFILM NORTH AMERICA CORPORATION, JVC KENWOOD
CORPORATION, JVCKENWOOD USA CORPORATION,
NIKON CORPORATION, NIKON INC., OLYMPUS CORPORATION,
OLYMPUS AMERICA INC., PANASONIC CORPORATION,
PANASONIC CORPORATION OF NORTH AMERICA,
SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

PAPST LICENSING GMBH & CO. KG,
Patent Owner.

Case IPR2016-01214
Patent 8,966,144B2

Before JONI Y. CHANG, JENNIFER S. BISK, and
MIRIAM L. QUINN, *Administrative Patent Judges*.

BISK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

INTRODUCTION

A. Background

Petitioner, listed above, filed a Petition requesting *inter partes* review of claims 1–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 66, and 78–87 (the “challenged claims”) of U.S. Patent No. 8,966,144 B2 (Ex. 1400, “the ’144 patent”). Paper 5 (“Pet.”). Patent Owner, Papst Licensing GmbH & Co., KG, filed a Preliminary Response. Paper 11 (“Prelim. Resp.”). On December 15, 2016, we granted the Petition, instituting trial on whether under § 103(a)¹ (1) claims 1–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, and 78–87 would have been obvious over Yamamoto,² Yamamoto 2,³ the SCSI Specification,⁴ and Admitted Prior Art,⁵ and (2) claim 66 would have been obvious over and Yamamoto, Yamamoto 2, Muramatsu,⁶ the

¹ Because the claims at issue have a filing date prior to March 16, 2013, the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), we apply the pre-AIA version of 35 U.S.C. §§ 102 and 103 in this Decision.

² U.S. Patent No. 6,088,532, issued July 1, 2000 (Ex. 1401) (“Yamamoto”).

³ U.S. Patent No. 6,256,452 B1, issued July 3, 2001 (Ex. 1407) (“Yamamoto 2”).

⁴ AMERICAN NATIONAL STANDARDS INSTITUTE, INC., AMERICAN NATIONAL STANDARD FOR INFORMATION SYSTEMS – SMALL COMPUTER SYSTEM INTERFACE-2, ANSI X3.131-1994 (1994) (Ex. 1405) (“SCSI Specification”).

⁵ See *e.g.* Ex. 1400, 3:37–46, 4:20–22, 5:11–14, 5:21–23, 5:37–47, 8:45–50, 10:26–29. Although discussed in the Petitioner’s analysis, the SCSI Specification and the Admitted Prior Art were omitted inadvertently from the statement of the asserted ground. Therefore, we treated the statement as mere harmless error and presumed that Petitioner intended to assert that the challenged claims are unpatentable based, in part on the SCSI Specification and the Admitted Prior Art. Inst. Dec. 7, n.3.

⁶ U.S. Patent No. 5,592,256, issued Jan. 7, 1997 (Ex. 1408) (“Muramatsu”).

SCSI Specification, and the Admitted Prior Art. Paper 12 (“Institution Decision” or “Inst. Dec.”).

Following institution, Patent Owner filed a Response (Paper 16, “PO Resp.”)⁷, and Petitioner filed a Reply (Paper 22, “Reply”). Upon authorization, Patent Owner filed objections to arguments and evidence filed with Petitioner’s Reply (Paper 26) and Petitioner file a response to those objections (Paper 28). We held an oral hearing on September 14, 2017. Paper 29 (“Tr.”).⁸

This is a Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons set forth the below, we conclude that Petitioner has shown by a preponderance of evidence that the challenged claims are *unpatentable*.

B. Related Matters

The parties indicate that the ’144 patent is involved in *Papst Licensing GmbH & Co. KG v. Canon Inc.*, Case No. 1:15-cv-01692 (D.D.C.) and other district court proceedings. Pet. 12–14; Paper 6, 1–3. This patent has also been challenged in several other petitions for *inter partes* review. Pet. 14; Paper 6, 4–5. A final written decision in each of the following proceedings

⁷ Patent Owner proffers testimony, supporting its position, by Thomas A. Gafford. Ex. 2007.

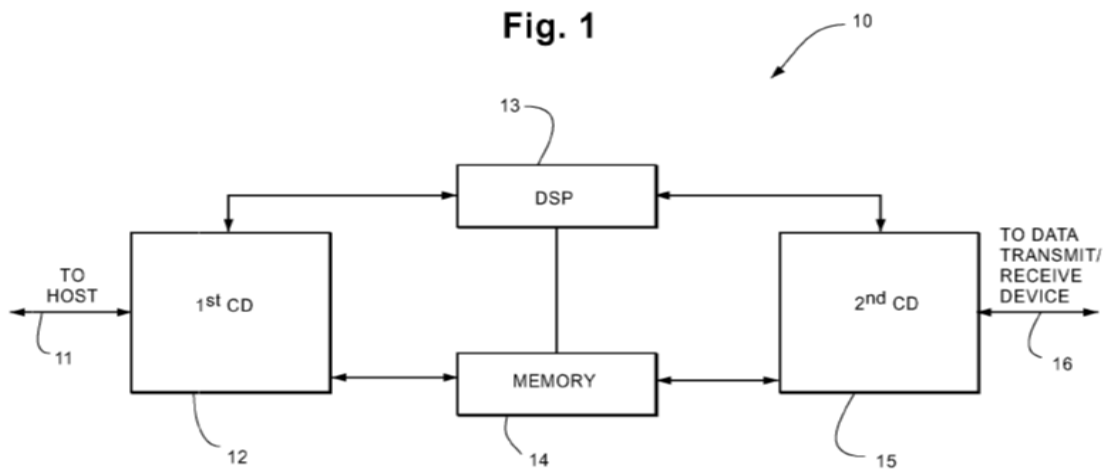
⁸ This was a consolidated hearing with related cases IPR2016-01199, IPR2016-01200, and IPR2016-01213. See Tr. In addition, on September 13, 2017, we held oral hearings for several other related cases IPR2016-01211, -01212, -01216, and -01225. Because of the overlap in issues in all the related cases, the transcripts for the September 13, 2017 hearings are also entered into the record in this case. Papers 30, 31.

is entered concurrently with this decision: IPR2016-01199, IPR2016-01212, IPR2016-01216, and IPR2016-01225.

C. The '144 Patent

The '144 patent describes an interface device for communication between a computer host device and a data transmit/receive device (e.g., a multi-meter, transmitting measured data to a computer). Ex. 1400, 1:18–22, 1:54–57. According to the '144 patent, using a specific driver for the data transmit/receive device that is customized to match very closely to an individual host system would achieve high data transfer rates across the interface, but such a specific driver cannot be used with other host systems. *Id.* at 2:4–19. Several solutions to this problem were known in the art. *Id.* at 2:20–3:25. For example, IOtech introduced an interface device for laptops, using a plug-in card for converting the personal computer memory card association (PCMCIA) interface into a known standard interface (IEEE 1284). *Id.* at 2:23–29. The plug-in card provided a printer interface for enhancing data transfer rates. *Id.* at 2:29–33. In another example, a floppy disk drive interface was used for connecting a host device to a peripheral device. *Id.* at 3:10–14. The interface appeared as floppy disk drive to the host, allowing a floppy disk drive and another peripheral device to be connected to the host device. *Id.* at 3:17–19.

The '144 patent indicates that the “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” is used. *Id.* at 3:33–36. Figure 1 of the '144 patent, reproduced below, illustrates a block diagram of an interface device.



As shown in Figure 1 above, interface device 10 connects to a host device via host line 11, and to a data transmit/receive device via output line 16. *Id.* at 4:62–5:10. Interface device 10 includes first connecting device 12, second connecting device 15, digital signal processor 13, and memory means 14. *Id.* In a preferred embodiment, the interface device is attached to a host device via a multi-purpose interface—e.g., a small computer systems interface (SCSI) interface—which includes both an interface card and specific driver software for the interface card. *Id.* at 3:51–57, 8:42–46. According to the '144 patent, SCSI interfaces were known to be present on most host devices or laptops. *Id.* at 8:42–46. By using a standard interface of a host device and by simulating an input/output device to the host device, the interface device “is automatically supported by all known host systems without any additional sophisticated driver software.” *Id.* at 11:38–44.

D. Challenged Claim

Of the challenged claims, claims 1, 84, and 86 are independent. Claims 2–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 66, and 78–83 depend directly or indirectly from claim 1, claim 85 depends directly from

independent claim 84, and claim 87 depends directly from independent claim 86. Claim 1 is illustrative:

1. An analog data generating and processing device (ADGPD), comprising:

an input/output (i/o) port;

a program memory;

a data storage memory;

a sensor designed to transmit data;

a processor operatively interfaced with the i/o port, the program memory, the data storage memory and the sensor;

wherein the processor is adapted to be involved in a data generation process by which the sensor generates analog data, the analog data is processed, and the processed analog data is stored in the data storage memory as at least one file of digitized analog data;

wherein the processor also is adapted to be involved in an automatic recognition process in which, when the i/o port is operatively interfaced with a multi-purpose interface of a computer, the processor executes at least one instruction set stored in the program memory and thereby causes at least one parameter which provides identification information regarding the ADGPD to be automatically sent through the i/o port and to the multipurpose interface of the computer

(a) without requiring any end user to load any software onto the computer at any time,

(b) without requiring any end user to interact with the computer to set up a file system in the ADGPD at any time,

(c) before a time when the computer is able to receive the at least one file of digitized analog data from the data storage memory, and

(d) regardless of the identity of a manufacturer of the computer, wherein the at least one parameter is consistent with the ADGPD being responsive to commands issued from a customary driver;

wherein the processor is further adapted to be involved in an automatic file transfer process in which, when the i/o port is operatively interfaced with the multi-purpose interface of the computer, and after the at least one parameter has been received by the multi-purpose interface of the computer, the processor executes at least one other instruction set stored in the program memory and thereby causes the at least one file of digitized analog data to be transferred to the computer regardless of the identity of the manufacturer of the computer and without requiring any user-loaded file transfer enabling software to be loaded on or installed in the computer at any time.

Ex. 1400, 11:56–12:36

ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Under the broadest reasonable interpretation standard, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

In the Institution Decision, we applied the broadest reasonable interpretation standard, as is proper for unexpired patents, to construe several terms. Inst. Dec. 8–16. We note, however, that the ’144 patent may expire shortly after the date of this Decision. In fact, the ’144 patent claims, under 35 U.S.C. § 120, the benefit of the filing date of U.S. Patent No. 6,470,399 (“the ’399 patent”), through a chain of continuing applications. Ex. 1400, [60]. After institution of trial in the present case, Patent Owner, in related cases involving the ’399 patent, indicated that the ’399 patent will expire on March 3, 2018 (20 years from the ’399 patent’s March 3, 1998

filing date). *See, e.g.*, Case IPR2016-01839, Ex. 1001, [22], Paper 14; Case IPR2017-00443, Paper 6, 7 n.1. In the Institution Decisions in the cases involving the '399 patent, we did not apply the broadest reasonable interpretation standard, instead adopting the claim constructions set forth by the district court and affirmed by the Federal Circuit in *In re Papst Licensing GmbH & Co. KG Litig. v. Fujifilm Corp.*, 778 F.3d 1255 (Fed. Cir. 2015) (Ex. 1011).⁹ *See, e.g.*, Case IPR2017-00443, Papers 7–8. In this proceeding, neither party provides, nor can we discern, any term for which the broadest reasonable interpretation standard would lead to a different result than the district court claim construction standard.

With few exceptions, addressed below, both Petitioner and Patent Owner agree with our claim constructions set forth in the Institution Decision. PO Resp. 11–15; Reply 25. While Petitioner urges us not to adopt any new construction in the Final Decision, Patent Owner advances several modifications. PO Resp. 11–15. We address below each of Patent Owner's proposed claim construction modifications in turn to the extent necessary to resolve the controversy regarding the patentability of the challenged claims. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

⁹ The '144 patent and the '399 patent share the same Specification and some of the same claim terms are used in both patents (e.g., interface device). Our interpretations herein are consistent with the Federal Circuit's decision.

1. “*analog data generating and processing device*”

The claim term “analog data generating and processing device” or “ADGPD” appears in each independent claim of the ’144 patent. Ex. 1400, 11:57–58, 16:11–12, 17:25–26. In the Institution Decision (Inst. Dec. 8–9), we noted that, apart from the title and claims, the Specification does not use the term “analog data generating and processing device.” *See generally* Ex. 1400. Rather, the Specification focuses on an interface device for communication between a host device and a data transmit/receive device. *See, e.g., id.* at Abstract., 1:18–22, 3:29–32, Figs. 1, 2. We further noted that claims 1 and 2 define an “analog data generating and processing device” as an interface device having, at least, a sensor. In that light, we construed the claim term “analog data generating and processing device” or “ADGPD” to encompass “an interface device having a sensor.” Inst. Dec. 8–9. After Institution, Patent Owner objects to this construction “[i]f intended to be a full construction.” PO Resp. 11. This construction is not intended to be complete, but simply to provide an example of what the phrase encompasses as necessary for the analysis below. We discern no reason to modify the construction. Therefore, for purposes of this Final Written Decision, we maintain our construction as to the term “analog data generating and processing device.”

2. “*sensor*”

Each independent claim recites “a sensor designed to transmit data.” *See, e.g.,* Ex. 1400, 11:62. Claim 17, which depends directly from claim 1, requires the “sensor” to comprise a “data transmit/receive device.” *Id.* at 13:7–8. In the Institution Decision (Inst. Dec. 9–10), we noted that, apart from the claims, the term “sensor” does not appear in the Specification of

the '144 patent. Rather, as noted above, the Specification focuses on an interface device for communication between a host device and *a data transmit/receive device*. Ex. 1400, 1:18–22, 3:29–32, 6:11–13, Figs. 1, 2. In that light, we construed a “sensor” to encompass a “data transmit/receive device”—a device that is capable of transmitting and/or receiving data. Inst. Dec. 9–10. After Institution, both parties indicate that they agree with this claim construction. PO Resp. 12–13; Reply 25. We discern no reason to modify the construction and, therefore, we maintain our construction as to the term “sensor.”

3. “*multi-purpose interface*”

Each independent claim recites “the i/o port is operatively interfaced with a multi-purpose interface of a computer.” *See, e.g.*, Ex. 1400, 12:5–7. The Specification of the '144 patent describes “the interface device according to the present invention is to be attached to a host device by means of a *multi-purpose interface* of the host device which can be implemented, for example, as a *small computer systems interface (SCSI) interface* or as an enhanced printer interface.” *Id.* at 3:51–56 (emphases added). The Specification also indicates that SCSI interfaces are present on most host devices or laptops. *Id.* at 8:45–46. Petitioner’s Declarant, Paul F. Reynolds, Ph.D., testifies that SCSI is “a standard for attaching a range of peripheral device types to computers,” and “SCSI is designed to be multi-purpose: to both support a variety of devices and to operate with a variety of operating systems.” Ex. 1403 ¶ 54.

In light of the Specification and the evidence before us regarding the general knowledge of an ordinarily skilled artisan, we construed a “multi-purpose interface” to encompass a “SCSI interface” in the Institution

Decision. Inst. Dec. 10. Patent Owner objects to this construction in the event that a multi-purpose interface is limited to a SCSI interface. PO Resp. 13. This construction does not limit a multi-purpose interface to a SCSI interface. Therefore, we discern no reason to modify the construction and, hence, we maintain our construction for the term “multi-purpose interface.”

4. “*customary driver*”

The claim term “customary driver” appears in each independent claim. Ex. 1400, 12:22–23, 17:10, 18:24. For instance, claim 1 recites “the at least one parameter is consistent with the ADGPD being responsive to commands issued from *a customary driver*.” *Id.* at 12:20–23 (emphasis added). Claim 29, which depends directly from claim 1, further recites “wherein the at least one parameter is consistent with the ADGPD being responsive to *a SCSI inquiry command*.” *Id.* at 13:38–40 (emphasis added).

The Specification of the ’144 patent indicates 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.” Ex. 1400, 3:33–37 (emphases added). The Specification further explains that “[d]rivers 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*.” *Id.* at 3:37–40 (emphases added). The Specification also indicates that SCSI interfaces are present on most host devices or laptops, and SCSI drivers are “normally included by the manufacturer of the multi-purpose interface.” *Id.* at 8:45–46, 10:23–33.

In light of the Specification, we construed, in the Institution Decision, a “customary driver” to encompass “a driver normally present in a

commercially available computer system (e.g., a hard disk driver or a SCSI driver).” Inst. Dec. 11–12. After Institution, Patent Owner maintains that “customary driver” means “a set of software routines normally part of commercially available computer systems,” but does not point to any additional evidence to support this position. PO Resp. 13–14. We discern no reason to modify the construction and, therefore, we maintain our claim construction of the term “customary driver.”

5. “*automatic recognition process*”

Each independent claim requires the processor to be adapted to be involved in an “automatic recognition process,” sending “identification information regarding the ADGPD” to the multi-purpose interface of the computer. *See, e.g.*, Ex. 1400, 12:4–36. In the Institution Decision (Inst. Dec. 12–13), we noted that the word “automatic” normally does not exclude all possible human intervention. *See WhitServe, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 19 (Fed. Cir. 2012); *CollegeNet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 1235 (Fed. Cir. 2005). According to the Specification of the ’144 patent, the communication between the host system and the interface device “is based on known standard access commands as supported by all known operating systems (e.g., DOS®, Windows®, Unix®).” Ex. 1400, 5:11–14. When the host system is connected to the interface device and is booted, “usual BIOS routines or multi-purpose interface programs issue an instruction, known by those skilled in the art as the INQUIRY instruction.” *Id.* at 5:17–23. In response to the INQUIRY instruction, the interface device sends a signal to the host system, *identifying a connected hard disk drive*. *Id.* at 5:24–30. In light of the Specification, we adopted the parties’ proposed construction, construing an “automatic

recognition process” as “a process by which the computer recognizes the ADGPD upon connection with the computer without requiring any user intervention other than to start the process.” Neither party disputes this claim construction. PO Resp. 14; Reply 25. For this Final Decision, we maintain our claim construction as to “automatic recognition process.”

6. “*automatic file transfer process*”

Each independent claim requires the processor to be adapted to be involved in an “automatic file transfer process,” sending a digitized analog data file to the computer. *See, e.g.*, Ex. 1400, 12:24–36. The Specification describes that a user interacts with the host computer to request transfer of the digitized analog data, and the transfer occurs automatically after the request is made. Ex. 1400, 6:2–5 (“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.”). In the Institution Decision (Inst. Dec. 13–14), we construed an “automatic file transfer process” to encompass a file transfer process that allows user intervention to initiate the process or make a transfer request. *See WhitServe*, 694 F.3d at 19; *CollegeNet*, 418 F.3d at 1235. Neither party challenges this claim construction. PO Resp. 14; Reply 25. For this Final Decision, we maintain our claim construction for “automatic file transfer process.”

7. “*without requiring*”

Each independent claim recites an apparatus with several negative limitations. For instance, claim 1 requires the automatic recognition process to occur “*without requiring* any end user to load any software onto the computer at any time,” and requires the automatic file transfer process to

occur “*without requiring* any user-loaded file transfer enabling software to be loaded on or installed in the computer at any time.” Ex. 1400, 12:4–36.

In this regard, the parties initially agreed to adopt the construction proposed by Patent Owner in the related district court proceeding—“without requiring the *end user* to install or load specific drivers or software for the ADGPD *beyond that included in the operating system or BIOS.*” Prelim. Resp. 20; Pet. 8–10 (citing Ex. 1404) (emphasis added). Patent Owner’s proposed claim construction was intended to clarify the aforementioned “without requiring” limitations so that they would not be read out of context with the rest of the claim language. Ex. 1404, 42.

However, in light of the Specification, we noted that the Patent Owner’s construction improperly excludes *SCSI drivers and drivers for multi-purpose interfaces*, which do not necessarily reside in the operating system or BIOS. Inst. Dec. 14–16. In our Institution Decision, we construed the “without requiring” limitations as “without requiring the *end user* to install or load specific drivers or software for the ADGPD beyond that included in the operating system, BIOS, *or drivers for a multi-purpose interface or SCSI interface,*” adding “drivers for a multi-purpose interface or SCSI interface” to the Patent Owner’s proposed construction. *Id.* (emphases added).

After institution, Petitioner agrees with our claim construction and urges us not to adopt a new construction. Reply 25. Patent Owner, however, disagrees with our claim construction, arguing that “a driver for a multi-purpose interface or SCSI interface that must be installed by a user would be inconsistent with these limitations.” PO Resp. 15 (citing Ex. 2007 ¶ 463). Patent Owner’s argument and Mr. Gafford’s testimony (Ex. 2007

¶ 63) are not consistent with the Specification. As our reviewing court has explained, the correct inquiry “is an interpretation that corresponds with what and how the inventor describes his invention in the specification.” *In re Smith Int’l, Inc.*, 871 F.3d 1375, 1382–83 (Fed. Cir. 2017).

Notably, the Specification indicates that, at the time of the invention, multi-purpose interfaces can be, *but are not necessarily*, integrated into the BIOS system. Ex. 1400, 3:59–4:1. The Specification also makes clear that

communication between the host device and the multi-purpose interface can take place *not only* via drivers for input/output device 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*.

Id. at 10:23–29 (emphases added). Interpreting the “without requiring” limitations to exclude the drivers for a multi-purpose interface would be unreasonable when the very same claim, claim 1, also requires a multi-purpose interface. *Id.* at 12:6–7. Claim 29, which depends from claim 1, also requires a SCSI driver to issue a SCSI INQUIRY command. *Id.* at 13:38–40. *Id.* at 13:38–40. As described in the Specification, the SCSI driver or the driver for the multi-purpose interface enables the automatic recognition process and automatic file transfer process, regardless of whether the SCSI driver is installed by the manufacturer or user. *Id.* at 3:51–56, 5:17–33, 11:14–23. Therefore, Patent Owner’s proposed construction would be inconsistent with the Specification and those claims.

More importantly, the issue in dispute centers on whether the “without requiring” limitations *prohibit* an end user from installing or loading other drivers. In that regard, we are guided by the Federal Circuit’s analysis in

Celsis In Vitro v. CellzDirect, Inc., 664 F.3d 922, 926–27 (Fed. Cir. 2012), concerning a claim reciting “without requiring,” which is similar to the language we have here. In that decision, our reviewing court stated: “‘without requiring’ means simply that the claim does not require the [recited] step,” and “performance of that step does not preclude a finding of infringement.” *Id.* Here too, the claim language is not as restrictive as Patent Owner argues. The claim language, under a plain reading, means that the end user is “not required” to load or install the recited software for transferring a file or recognizing a device. The claim language, however, *does not prohibit* the end user from ever installing or loading the recited software. The key word in the claim language is “requiring”—if the software is not required, then it does not matter whether the end user loaded or installed the software.

In view of the foregoing reasons, we maintain our claim construction, interpreting the “without requiring” limitations as “without requiring *the end user* to install or load specific drivers or software for the ADGPD beyond that included in the operating system, BIOS, *or drivers for a multi-purpose interface or SCSI interface.*”

8. “*a first computer*” and “*a second computer that is manufactured by a company other than the company that manufactured the first computer*”

Claim 86 requires an automatic recognition process and an automatic transfer process to occur for a “first computer” and a “second computer that is manufactured by a company other than the company that manufactured the first computer.” Ex. 1400, 17:41–18:18. In the Institution Decision, we adopted the parties’ proposed claim construction, interpreting these limitations of claim 86 to refer to, respectively, a first computer and a second

computer “regardless of the identity of a manufacturer of the computer.” Inst. Dec. 16; Pet. 56; Prelim. Resp. 29–37. After institution, both parties agree with our claim construction. PO Resp. 15; Reply 25. Therefore, for this Final Written Decision, we maintain our claim construction for these limitations of claim 86.

B. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness.¹⁰ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active

¹⁰ Neither party introduced objective evidence of non-obviousness or argued that the existence of secondary considerations impacts this Decision’s obviousness analysis. Accordingly, our analysis is based upon the first three of the four *Graham* factors.

workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). As noted in our Institution Decision (Inst. Dec. 17–18), Dr. Reynolds testifies that a person having ordinary skill in the art at the time of the invention “would have had at least a four-year degree from a reputable university in electrical engineering, computer science, or related field of study, or equivalent experience, and at least two [years of] experience in studying or developing computer interfaces or peripherals.” Ex. 1403 ¶ 39. Dr. Reynolds further testifies that such an artisan also would “be familiar with operating systems (e.g., MS-DOS, Windows, Unix) and their associated file systems (e.g., a FAT file system), device drivers for computer components and peripherals (e.g., mass storage device drivers), and communication interfaces (e.g., SCSI and PCMCIA interfaces).” *Id.*

Patent Owner confirms that Petitioner’s statements regarding the level of ordinary skill in the art are mostly consistent with Patent Owner’s view, but nonetheless contends that an ordinarily skilled artisan would have one more year of experience, or, alternatively, five or more years of experience without a bachelor’s degree. Prelim. Resp. 18; PO Resp. 10–11; Ex. 2007 ¶ 18. Patent Owner presents no argument as to why Petitioner’s proposal is erroneous or why Patent Owner’s proposal is more appropriate for this proceeding. More importantly, no issue to be decided in this Decision hinges on whether either party’s proposed level of ordinary skill in the art is adopted.

We find Dr. Reynolds’ testimony persuasive as it presents more than just the educational level of a person of ordinary skill in the art. Similarly, Petitioner’s more detailed proposal is helpful as it identifies the familiar objects of the technology used by a person of ordinary skill at the

time of the invention: operating systems (e.g., MS-DOS, Windows, Unix) and their associated file systems (e.g., a FAT file system), device drivers for computer components and peripherals (e.g., mass storage device drivers), and communication interfaces (e.g., SCSI and PCMCIA interfaces). Ex. 1403 ¶ 40. We, therefore, adopt Petitioner’s proposed level of ordinary skill in the art. We further note that the prior art at issue in this proceeding reflects the level of ordinary skill in the art at the time of the invention. See *Okajima v. Bourdeau*, 261 F.3d 1350, 1354–55 (Fed. Cir. 2001).

D. Obviousness over Yamamoto, in Combination with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art

Petitioner asserts that claims 1–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, and 78–87 (all the challenged claims except claim 66) are unpatentable under 35 U.S.C. § 103(a) as obvious over Yamamoto, combined with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art. Pet. 22–71. Petitioner explains how the combination of the prior art references teaches the claimed subject matter and proffers articulated reasoning as to why a person of ordinary skill in the art would have combined the prior art teachings in the manner asserted, citing to Dr. Reynolds’s Declaration for support. *Id.* (citing Ex. 1403).

Patent Owner argues that Petitioner fails to show unpatentability because “Yamamoto’s configuration and removable hard disks available at the time would not motivate a POSITA to use Yamamoto’s system control circuit to transfer a file of digitized data to the computer.” PO Resp. 21–37.

Upon consideration of the parties’ contentions and supporting evidence, we determine that Petitioner has demonstrated by a preponderance of the evidence that Yamamoto, in combination with Yamamoto 2, the SCSI

Specification, and the Admitted Prior Art, renders obvious the challenged claims. In our discussion below, we begin with a brief overview of the prior art, and then we address the obviousness of the challenged claims, focusing on those assertions by Petitioner that are disputed by Patent Owner.

1. Overview of Yamamoto

Yamamoto discloses an electronic camera having an image sensor for recording analog image data, and a hard disk that can be used as a storage device to an external computer via a SCSI interface. Ex. 1401, 1:7–10, 4:21–30, 7:43–48, 23:8–13. Figure 29 of Yamamoto is reproduced below.

Fig. 29

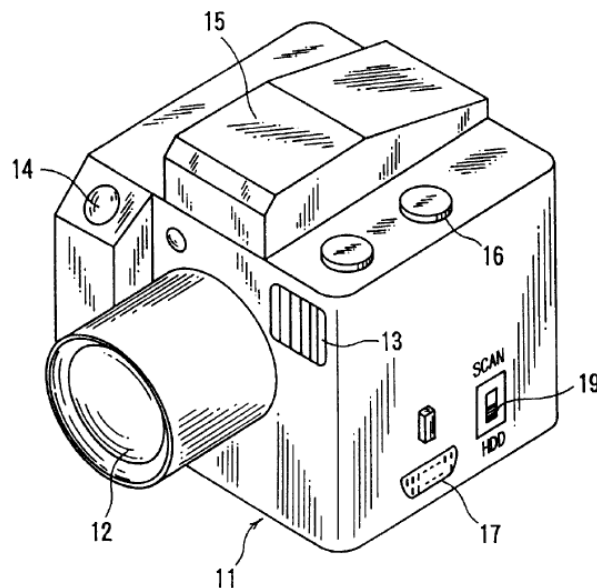
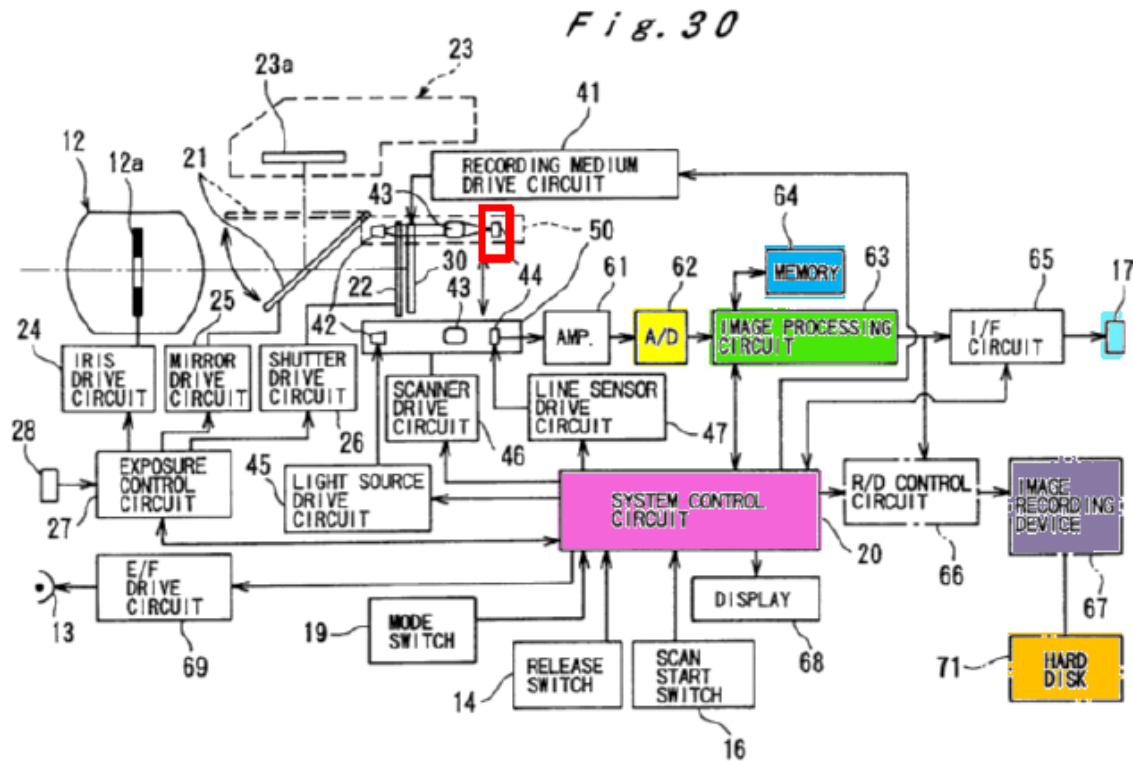


Figure 29 is an external view of a still video camera. Ex. 1401, 5:45–47, 22:6–7. “Beside the output terminal 17, a mode switch 19 is provided to set an operation mode of the still video camera.” *Id.* at 22:8–10. In the first mode, “HDD mode,” the hard disk of the camera (shown in Figure 30 as Hard Disk 71) “is used as the external memory for a computer connected to the still video camera though the output terminal 17.” *Id.* at 22:25–27.

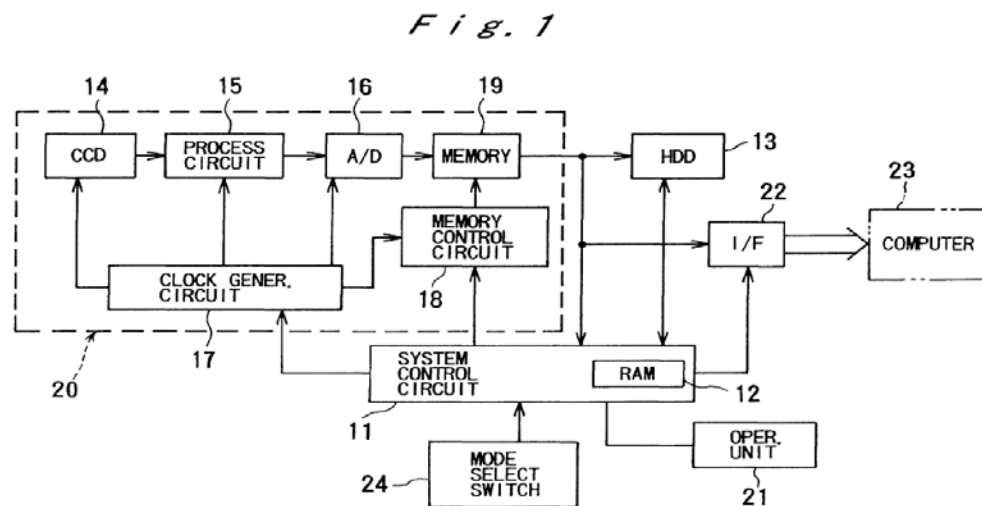
Figure 30 of Yamamoto, a block diagram of the internals of the camera shown in Figure 29, is reproduced below with highlights added by Petitioner (Pet. 33).



As illustrated in Figure 30 of Yamamoto, the camera comprises: system control circuit 20 (highlighted in pink), image sensor 44, e.g., a charge-coupled device (CCD) sensor (highlighted with a red box), analog-to-digital (A/D) converter 62 (highlighted in yellow), image processing circuit 63 (highlighted in green), memory 64 (highlighted in blue), image recording device 67 (highlighted in purple), detachable hard disk 71 (highlighted in orange), and output terminal 17 (highlighted in light blue). *Id.* at 6:7–8:5, 22:16–67. Mode switch 19 (not highlighted) is connected to system control circuit 20.

2. Overview of Yamamoto 2

Yamamoto 2, likewise, describes an electronic camera having a sensor for recording image data, and a hard disk device that can be used as a storage device to an external computer. Ex. 1407, Abs. The hard disk device has a file system and file allocation table so that the user can search the hard disk for stored image data. *Id.* at 3:58–62. Figure 1 of Yamamoto 2 is reproduced below.



As illustrated in Figure 1 of Yamamoto 2, the electronic camera comprises an optical system (not shown), system control circuit 11, hard disk device 13, solid state imaging device (CCD) 14, analog-to-digital (A/D) converter 16, memory 19, interface 22, and external computer 23. *Id.* at 2:47–3:37. System control circuit 11 comprises a microcomputer which controls the entire electronic camera, and RAM 12. *Id.* at 2:51–53. An image signal corresponding to an object image is generated in CCD 14, and is converted into a digital signal in A/D converter 16. *Id.* at 2:66–3:9. The digital image data are stored in memory 19, and then transferred and recorded on a predetermined area of the hard disk mounted in hard disk device 13. *Id.* at 2:53–55, 3:26–28, 4:1–4. In one of the operational modes,

hard disk device 13 is connected to external computer 23 through interface 22, so that the hard disk of the electronic camera can be operated as an external storage device of external computer 23. *Id.* at 2:55–57, 3:34–36.

3. Overview of the SCSI Specification

The SCSI Specification is a technical Specification published by the American National Standard for Information Systems to set forth the SCSI standards. According to the SCSI Specification, the SCSI protocol “is designed to provide an efficient peer-to-peer I/O bus with up to 16 devices, including one or more hosts.” Ex. 1405, Abs. The primary objective of the SCSI interface is “to provide host computers with device independence within a class of devices.” *Id.* at 6. The SCSI-2 “standard defines an input/output bus for interconnecting computers and peripheral devices.” *Id.* at 1. “It includes the necessary specification of the mechanical, electrical, and functional characteristics of the interface to allow interoperability of conforming devices.” *Id.* “SCSI-2 includes command sets for magnetic and optical disks, tapes, printers, processors, CD-ROMs, scanners, medium changers, and communications devices.” *Id.* at Abs. “The command set definitions allow a sophisticated operating system to obtain all required initialization information from the attached SCSI-2 devices.” *Id.* at 6.

4. Overview of the Admitted Prior Art

According to the ’144 patent, drivers for hard disks were known to be customary drivers “in practically all host devices.” Ex. 1400, 3:37–46, 4:20–22. The ’144 patent also indicates that SCSI interfaces and SCSI drivers were known in the art at the time of the invention. *Id.* at 8:45–50, 10:26–29. According to the ’144 patent, SCSI interfaces were present on most host devices or laptops, and SCSI drivers were “normally included by

the manufacturer of the multi-purpose interface.” *Id.* at 10:27–33. Moreover, certain standard access commands, including the SCSI INQUIRY command, were “supported by all known operating systems (e.g., MS-DOS, Windows, Unix^[®]).” *Id.* at 5:11–14, 5:21–23, 10:27–33. The ’144 patent further discloses that it was known to those skilled in the art that a virtual boot sequence includes “the drive type, the starting position and the length of the file allocation table (FAT), [and] the number of sectors.” *Id.* at 5:43–47.

Patent Owner argues in its Response that some of the statements Petitioner relies on are not admissions of prior art. PO Resp. 10. Patent Owner particularly refers to the portion of the Specification at column 4, lines 20–52 (Ex. 1400). *Id.* The relevant portion of the Specification states “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.” Ex. 1400, 4:20–23. This statement conveys that the applicant deemed it known that support for hard disks is available on virtually all commercially available host systems. Such statement is therefore an admission by applicant that the knowledge was in the prior art.

Accordingly, we are persuaded that the statement regarding support for hard disks on host systems is an admission of prior art. In any event, we do not rely on this admission in our obviousness analysis below.

5. Independent Claims 1, 84, and 86

Petitioner contends that claims 1, 84, and 86—all the challenged independent claims—would have been obvious over a combination of Yamamoto, Yamamoto 2, the SCSI Specification, and the Admitted Prior

Art. Pet. 26–57. Patent Owner disagrees. PO Resp. 21–37. For the reasons discussed below, we determine that Petitioner has demonstrated by a preponderance of the evidence that Yamamoto in combination with Yamamoto 2, the SCSI Specification, and Admitted Prior Art renders obvious claims 1, 84, and 86.

An Analog Data Generating and Processing Device (ADGPD)

Claim 1 recites an “analog data generating and processing device” having an *interface device*—which includes an input/output (i/o) port, a program memory, a data storage memory, and a processor—and a *sensor*. Ex. 1003, 11:57–65. Claims 84 and 86 also require a similar limitation. *Id.* at 16:11–19, 17:25–33.

Petitioner asserts that Yamamoto teaches or suggests the claimed ADGPD. Pet. 27–31. In particular, Petitioner takes the position that Yamamoto’s still video camera 11 along with its system control circuit 20 (processor), memory, line sensor (a sensor that transmits analog image data), and output terminal 17 (input/output port), which allows a computer (host computer) and the camera to exchange SCSI commands and data via a cable and a SCSI interface (multipurpose interface), jointly form the claimed ADGPD. *Id.* at 27. Petitioner explains that output terminal 17 “permits connection [from the camera] to an external computer through a cable” and “allows the computer and . . . camera to exchange SCSI commands and data.” *Id.* at 28.

Based on the evidence before us, we are persuaded by Petitioner’s showing that Yamamoto’s camera discloses an ADGPD. Patent Owner does not dispute Petitioner’s contentions regarding this limitation. *See* PO Resp. 21–37. Accordingly, we determine that Petitioner has established by a

preponderance of the evidence that Yamamoto teaches or suggests an ADGPD as required by claims 1, 84, and 86.

A Processor Operatively Interfaced with a Multipurpose Interface, a Memory, and an Analog Source

Each of claims 1, 84, and 86 requires the claimed processor to be “operatively interfaced” with the i/o port, the program memory, the data storage memory, and the sensor. *See, e.g.*, Ex. 1400, 11:63–65, 16:17–19, 17:31–33.

As mentioned above, Petitioner maps the micro-processor of system control circuit 20 to the claimed processor of claims 1, 84, and 86. According to Petitioner, output terminal 17 “allows the computer and still video camera to exchange SCSI commands and data.” Pet. 28 (citing Ex. 1401, 7:43–48). In addition, Petitioner asserts that the micro-processor controls several types of memory, including the program memory of control circuit 20, the data storage memory of memory 64 (through the image processing circuit), and the data storage memory of the image recording device and hard disk (through the recording device control circuit 66). *Id.* at 29–30 (citing Ex. 1401, 7:33–36 (“The digital pixel signals are subjected to a shading correction, a gamma correction and so on by an image processing circuit 63 under control of the system control circuit 20, and then, are temporarily stored in a memory 64.”), 7:60–63 (“[T]he recording device control circuit 66 [is] operated in accordance with a command signal outputted from the system control circuit 20.”)). Petitioner, therefore, concludes that the micro-processor of system control circuit 20 is operatively interfaced with output terminal 17 (through interface circuit 65), its own program memory, the data storage memory of memory 64 and the

image recording device (through the recording device control circuit 66), and line sensor 44 (through the line sensor drive circuit 47). *Id.* at 31 (citing Ex. 1401, 6:7–10, 7:27–30, 7:35–36, 7:60–63; Ex. 1403 ¶ 86).

Based on the evidence before us, we are persuaded by Petitioner’s showing that Yamamoto teaches this limitation. Patent Owner does not dispute Petitioner’s contentions regarding this limitation. *See, e.g.*, PO Resp. 24 (“[A]s explained below and in Mr. Gafford’s declaration, system control circuit 20 is a micro-processor that outputs command signals to other circuits within Yamamoto’s camera that are involved in image data acquisition and processing.”) (citing Ex. 2007 ¶¶ 68–74). Accordingly, we determine that Petitioner has established by a preponderance of the evidence that Yamamoto teaches or suggests a processor operatively interfaced with an i/o port, program memory, data storage memory, and sensor as recited by claims 1, 84, and 86.

The Data Generation Process

Claim 1 recites “wherein the processor is adapted to be involved in a data generation process by which the sensor generates analog data, the analog data is processed, and the processed analog data is stored in the data storage memory as at least one file of digitized analog data.” Ex. 1400, 11:66–12:3. Claims 84 and 86 recite substantially similar limitations. *Id.* at 16:20–24, 17:34–38.

Petitioner asserts that Yamamoto teaches or suggests the claimed data generation process. Pet. 31–32. In particular, Petitioner takes the position that the micro-processor of Yamamoto’s system control circuit 20 controls the data generation process through line sensor drive circuit 47, image processing circuit 63, and recording device control circuit 66, among others.

Id. at 31 (citing Ex. 1403 ¶ 87). Petitioner explains that “line sensor 44 generates pixel signals, which are digitized and processed, [which] then can be stored as an image data file on the hard disk 71.” *Id.* at 31–32 (citing Ex. 1401, 22:47–56).

Based on the evidence before us, we are persuaded by Petitioner’s showing that Yamamoto teaches this limitation. Ex. 1401, 22:47–56, 7:31–37; Ex. 1403 ¶ 87. Patent Owner does not dispute Petitioner’s contentions regarding this limitation. *See* PO Resp. 21–37. Accordingly, we determine that Petitioner has established by a preponderance of the evidence that Yamamoto teaches or suggests the data generation process recited by claims 1, 84, and 86.

The File System and File Allocation Table

Claims 1, 84, and 86 additionally recite that the digitized analog data “is stored as at least one file of digitized analog data.” *Id.* at 1400, 12:2–3, 16:23–24, 17:38–39. Claims 42 and 84 additionally require “ADGPD *file system information* to be automatically sent to the i/o port.” *See, e.g., id.* at 14:3–17 (emphasis added). Claims 46 and 84 further require “*file allocation table* information to be sent to the i/o port.” *See, e.g., id.* at 14:28–39 (emphasis added).

Petitioner asserts that the prior art combination suggests having a file system and a file allocation table for storing digitized analog data on the camera’s hard disk.¹¹ Pet. 31–32, 53–54. Petitioner notes that Yamamoto’s

¹¹ As noted in the Institution Decision (Inst. Dec. 25, n.5), we consider Petitioner’s arguments and supporting evidence for claims 1, 42, 46, 84, and 86 in connection with a file system, a file allocation table, and storing data as a file, collectively, as a whole.

system control circuit 20 controls all operation of the camera. Pet. 31–32; Ex. 1403 ¶ 87. Petitioner also alleges that Yamamoto’s sensor is a sensor that generates analog data, which are digitized and stored on the hard disk as a file. Pet. 31–32; Ex. 1403 ¶ 87 (citing Ex. 1401, 7:31–37, 22:47–56).

Petitioner suggests that Yamamoto alone does not disclose expressly a file system or a file allocation table, but nevertheless, points out that Yamamoto describes that the camera’s hard disk is used as an external storage device for a computer by using a SCSI interface. Pet. 32, 53 (citing Ex. 1401, 22:18–22, 22:44–56, 23:8–14). Petitioner contends that it would have been obvious to one with ordinary skill in the art that the digitized image data on the hard disk, usable by a computer, would be stored in files and managed by a file system. Pet. 32; Ex. 1403 ¶ 88.

As support, Dr. Reynolds testifies that “any general purpose operating system (e.g., MS-DOS, MS Windows, UNIX) would expect the hard drive to have a file system installed on it in order for it to be used in a meaningful way.” Ex. 1403 ¶ 89. According to Dr. Reynolds, an ordinarily skilled artisan would have had reasons to implement a file system and a file allocation table for formatting Yamamoto’s hard disk, in light of Yamamoto 2, “in order to search a hard disk for stored image data, one would refer to a ‘FAT-table of the hard disk.’” *Id.* ¶¶ 140–41 (citing Ex. 1407, 3:58–62). Dr. Reynolds further explains that such an artisan would have understood that information regarding the file system and file allocation table would have to communicate to the external computer first before the computer can access the hard disk. *Id.*

Because Yamamoto 2 is a patent describing similar subject matter, with the same assignee and overlapping inventorship, as Yamamoto, we

conclude it would have been obvious to a person of ordinary skill in the art to look to both the teachings of both Yamamoto and Yamamoto 2.

Moreover, based on the evidence and explanation proffered by Petitioner, we determine that Petitioner has established that Yamamoto in combination with Yamamoto 2, the SCSI Specification, and Admitted Prior Art renders obvious having a file system and file allocation table for storing the digitized image data on a hard disk as required by the challenged claims.

The Automatic Recognition Process

Claims 1 and 84 recite

the processor also is adapted to be involved in an automatic recognition process in which. . . causes at least one parameter which provides identification information regarding the ADGPD to be automatically sent through the i/o port and to the multi-purpose interface of the computer

Ex. 1400, 12:4–12, 16:25–33. Claim 86 recites similar language. *Id.* at 17:39–46, 18:20–21.

Petitioner asserts that a combination of the teachings of Yamamoto, the SCSI Specification, and the Admitted Prior Art demonstrate that the claimed automatic recognition process was performed through well-known I/O interface level protocols. Pet. 37. Specifically, Petitioner argues that the SCSI Specification discloses an INQUIRY command to discover information about the attached device. *Id.* (citing Ex. 1403 ¶¶ 92, 93, 57, 58). Petitioner also asserts that the Admitted Prior Art describes that the host sends an INQUIRY command in order to determine information about the attached device. *Id.* (citing Ex. 1403, ¶¶ 37, 94 (citing Ex. 1400, 5:27–54)). And, according to Petitioner, Yamamoto discloses that in response to a SCSI INQUIRY command, the camera sends a parameter indicating which

of the two modes it is in. *Id.* at 37. If the camera is in mode 2—acting as an external hard drive—the camera will also indicate in its response that it will respond to typical SCSI hard drive commands. *Id.* Petitioner concludes that the combination of teachings renders this limitation obvious because Yamamoto’s system control circuit 20 executes program instructions causing a parameter identifying the camera as a hard disk to be automatically sent through output terminal 17 to the SCSI interface of the computer. *Id.* at 37–38 (citing Ex. 1403 ¶ 95).

Based on the evidence before us, we are persuaded by Petitioner’s showing that Yamamoto teaches the claimed automatic recognition process. Ex. 1401, 22:47–56, 7:31–37; Ex. 1403 ¶ 95. Patent Owner does not dispute Petitioner’s contentions regarding this limitation. *See* PO Resp. 21–37. Accordingly, we determine that Petitioner has established by a preponderance of the evidence that Yamamoto teaches or suggests the automatic recognition process recited by claims 1, 84, and 86.

Automatic Data Transfer

Claims 1 and 84 recite

the processor is further adapted to be involved in an automatic file transfer process in which . . . after the at least one parameter has been received by the multi-purpose interface of the computer, the processor . . . causes the at least one file of digitized analog data to be transferred to the computer

Ex. 1400, 12:24–33, 16:59–67. Claim 86 recites similar language. *Id.* at 18:25–34.

Petitioner asserts that Yamamoto, in combination with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art renders these data transfer limitations obvious. Pet. 40–45. In particular, Petitioner asserts

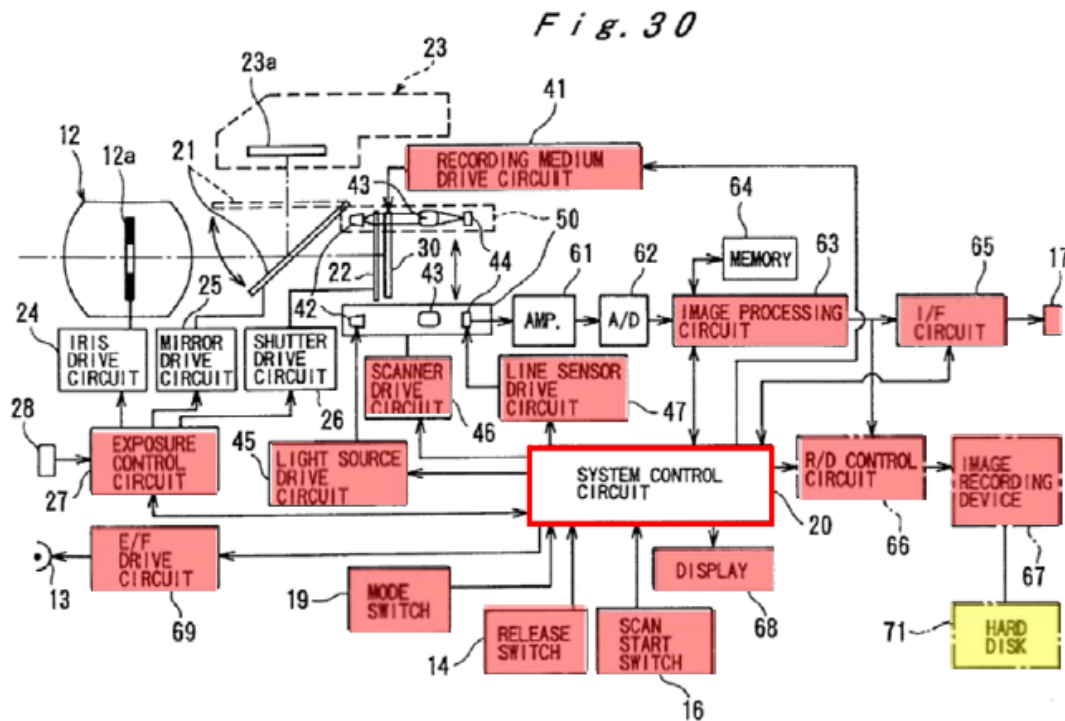
that Yamamoto discloses the data transfer limitation using the SCSI interface between Yamamoto's host computer and camera. Pet. 43 (citing Ex. 1403 ¶ 105). According to Petitioner, at the time the host computer and camera are connected in HDD mode Yamamoto discloses the following steps: (1) the computer and camera execute the INQUIRY step, as discussed above with respect to the automatic recognition process; (2) the camera responds to the INQUIRY that it is SCSI hard drive and exchanges file system information with the computer; and (3) the computer issues SCSI READ commands to read the data files from the camera's hard drive. *Id.* (citing Ex. 1403 ¶¶ 106–107). Petitioner concludes that “[t]his required sequence of events discloses ‘when the i/o port is operatively interfaced with the multi-purpose interface of the computer, the processor executes at least one other instruction set.’” *Id.* Petitioner also explains that these steps are “automatic” in that the device drivers or other code, and not the end user, is involved in carrying out these steps. *Id.* at 44.

Petitioner adds that Yamamoto discloses that the micro-processor of system control circuit 20 is involved in this process. *Id.* Specifically, according to Petitioner, system control circuit 20 “executes at least one other instruction set or computer code stored in the program memory (e.g., responds to SCSI hard disk drive commands from the external computer,” causing at least one file of digitized analog data to be transferred to the computer. *Id.* (citing Ex. 1401, 22–23 generally; Ex. 1403 ¶¶ 110, 126–128).

Patent Owner counters, asserting that when in HDD mode, instead of being executed by the camera's system control circuit 20 (or any other processor of the camera), the data transfer process is instead controlled by

the host computer. PO Resp. 8, 21–31. According to Patent Owner, both Yamamoto and Yamamoto 2 make this clear by disclosing that in HDD mode, the camera’s hard disk 71 is a *separate* external hard drive that can be attached directly to a computer. *Id.* at 8, 21, 23–24 (citing Ex. 1401, 23:38–48; Ex. 1407, 1:32–35, 1:43–47, 1:61–67). Patent Owner concludes that, because in claim 1, the processor that causes the data transfer must be the same processor used for the other claimed processes, and therefore must reside in the camera, Petitioner has not sufficiently shown that the asserted references teach the data transfer limitation. *Id.* at 23–31. In fact, according to Patent Owner, the asserted prior art actually *teaches away* from using the camera’s processor to execute the claimed data transfer process. *Id.* at 21.

Patent Owner makes the following arguments in support of its position. First, according to Patent Owner, although Yamamoto discusses in detail that system control circuit 20 executes the image data acquisition and processing functions of the camera, it does not explicitly describe executing the data transfer process. *Id.* at 24–25 (citing Ex. 1401 6:20–27, 6:55–57, 7:23–29, 7:35–36, 7:60–8:5; Ex. 2007 ¶¶ 68–74). To illustrate this argument, Patent Owner provides an annotated version of Yamamoto’s Figure 30, reproduced below.



Id. at 26.

According to Patent Owner, Yamamoto discloses the components and circuits shaded red in annotated Figure 30 are “connected to system control circuit 20 to control the operation of the camera when the camera is acquiring and even recording data on the hard disk.” *Id.* But, importantly, according to Patent Owner, “Yamamoto does *not* disclose that system control circuit 20 is involved in causing data to be transferred from hard disk 71 (shaded in yellow) to a computer connected to the camera.” *Id.* (emphasis added).

Patent Owner argues that Petitioner incorrectly relies on columns 22 and 23 of Yamamoto for their assertion that Yamamoto discloses the data transfer process. *Id.* at 28. According to Patent Owner, this portion of Yamamoto “is silent as to whether system control circuit 20 responds to a command from the computer that causes at least one file of digitized data to

be transferred from the hard disk to the computer.” *Id.* (citing Ex. 2007 ¶ 67). Patent Owner argues that the SCSI commands discussed in this portion of Yamamoto—READ CAPACITY, FORMAT UNIT, and INQUIRY—do not result in the transfer of digitized analog data to the host computer, instead only allowing the host computer to format the disk and read the total capacity of the disk. *Id.* at 28–29 (citing Ex. 1401, 23:30–44; Ex. 2007 ¶ 68). Further, Patent Owner explains that Yamamoto’s disclosure that system control circuit 20 controls the camera as a whole, does not include disclosure of transfer of data from the removable hard disk, because that “is not a function of a still video camera” as is acquiring and saving images. *Id.* at 25.

According to Patent Owner, Yamamoto’s silence as to control of the data transfer process leads to a conclusion that

[u]pon entering the hard disk mode . . . to be consistent with the operation of the other circuits, the system control circuit 20 *most likely* would send a command signal to the recording device control circuit 66, which sits directly between the hard disk 71 and the output terminal 17, to take over processing commands from the computer in this mode.

Id. at 30 (emphasis added).

Based on these assumptions, Patent Owner explains that a person of ordinary skill in the art would have understood that “Yamamoto’s removable hard drive *must* be a SCSI hard drive” and this “would eliminate the need for any additional circuitry or controls [on the camera] to transfer a file from the SCSI hard drive to a computer connected to the camera” since the SCSI hard drive would already be equipped for such transfer. *Id.* at 32 (emphasis added) (citing Ex. 2006 ¶¶ 83–89). Patent Owner goes on to contend that eliminating the need for this processing power in the camera would save

costs and allow control circuit 20 to be more efficient without the need for extra processing power. *Id.* at 31–33. Patent Owner adds that IDE hard drives, the other option for hard drive 71 during the relevant time period, was “not suitable for use as an external drive to a computer because of cabling limitations,” among other reasons. *Id.* at 33 (citing Ex. 2007 ¶ 86).

Second, Patent Owner asserts that a person of skill in the art would understand that, even if the camera itself *were* involved in the data transfer process, it is *more likely* that interface circuit 65 would be in the path between hard disk 71 and output terminal 17 rather than control circuit 20. *Id.* at 33–37. According to Patent Owner, this is so because interface circuit 65 “is already designed to process and convert data in a way that is more capable of facilitating data transfer” between the two. *Id.* at 34 (citing Ex. 2007 ¶ 92). Patent Owner also asserts that this path would save processing power. *Id.* at 35–36.

We do not agree with Patent Owner’s reading of Yamamoto. Although we agree that Yamamoto does not explicitly describe the data transfer process in terms of the exact internal circuits, a more natural reading of Yamamoto’s disclosure is that, along with all the other functions of the camera, system control circuit 20 initiates the data transfer process.

We find too narrow Patent Owner’s conclusion that lack of a detailed description of the internal camera components involved in data transfer leads to an assumption that the camera is not involved in that process. Yamamoto explicitly states that system control circuit 20 includes a processor that “control[s] the still video camera as a whole.” Ex. 1401, 6:7–10. We credit Dr. Reynolds’ testimony that a person of ordinary skill in the art would have understood this statement to mean that the system

control circuit “manages the different camera operation modes” and, therefore, that the system control circuit controls data transfer, “at least to the extent that it initiates the external hard disk mode, and prevents other circuits from operating in different modes while the external computer is requesting access to the hard disk via the camera’s interface circuit 65.”

Ex. 1413 ¶ 4.¹²

Dr. Reynolds further explains this conclusion, stating that “A POSITA would have understood that as part of the process at step 106 [of Yamamoto’s Fig. 31] . . . [system control circuit 20] would output control signals to control the operation of interface circuit 65 and R/D control circuit 66 to cause those circuits to enable data transfer from the hard disk 71 to an external computer.” Ex. 1413 ¶ 3 (citing Ex. 1401, 7:60–64, 22–23). Moreover, Dr. Reynolds explains that “[a] POSITA would have also understood that when in external hard disk mode, [system control circuit] 20 would prevent other circuits of the camera from accessing hard disk 71, to prevent access conflicts” and also would “prevent other camera circuits from sending image data directly from the optical image processing circuitry to the external computer as they would in scanner mode.” *Id.* ¶ 4. As an example to explain this conclusion, Dr. Reynolds points to Yamamoto’s disclosure that “when in hard disk mode a SET WINDOW

¹² Patent Owner argues that much of the content of Petitioner Reply and Exhibit 1413 are outside the scope of a proper reply. Paper 26. We have gone through Patent Owner’s list of objections and are not persuaded that any of them have merit. Instead, we find that these arguments and corresponding evidence are properly responsive to argument raised in Patent Owner’s Response. See 37 C.F.R. § 42.23(b).

command, which is permitted during scanner mode operation” cannot be received by the camera. *Id.* (citing Ex. 1401, 23:40–43).

Yamamoto, itself, also supports Dr. Reynolds’ explanation. For example, Yamamoto discloses that the external computer has a capability to use the camera’s hard disk, which stores the digitized image data, as an external memory by using a SCSI interface. Ex. 1401, 4:24–27, 22:16–23:44. Yamamoto also discloses that the system control circuit is involved in responding to SCSI commands. *Id.* at 22:23–26; 23:4–43. And Patent Owner’s expert, Mr. Gafford, agrees with this point. *See* Ex. 1412, 20:20–21:4.

In contrast, Yamamoto does not discuss any limits to the processing power of system control circuit 20 or describe it as anything other than a “microcomputer or micro-processor.” Ex. 1401, 6:7–10. This casts doubt on Mr. Gafford’s assumption that one would need to “modify Yamamoto” such that system control circuit 20 “would be involved in hard disk mode data transfer.” Ex. 2007 ¶ 67. Mr. Gafford’s speculation, based on that assumption, does not lead to a finding to the contrary. Instead of describing what a person of ordinary skill *would understand* based on the teachings of Yamamoto, Mr. Gafford hypothesizes that a person of ordinary skill would find “it would be *most advantageous* to,” “*it is reasonable and likely* that,” and “*the most practical implementation* of Yamamoto would be” that system control circuit 20 would not be involved in the data transfer process. Ex. 2007 ¶¶ 76, 78, 80 (emphasis added). These guesses as to what a person of ordinary skill would find to be the *best* way to implement Yamamoto’s data transfer process do not illuminate what a person of ordinary skill would have understood as the ways of implementing the data

transfer process. We find, therefore, that Yamamoto discloses a system control circuit 20 that is capable of performing the functions required for the data transfer process. Ex. 1403 ¶¶ 102–114; Ex. 1413 ¶¶ 5–7, 10.

We also do not agree with Patent Owner’s assumption that because Yamamoto’s hard disk is detachable from the computer it must be able to connect directly to a computer, thus requiring the drive to include its own SCSI data transfer capabilities. We find that Mr. Gafford’s testimony is in conflict with Patent Owner’s assumption because he agrees that the hard disk is not required to be directly connected to the computer. See Ex. 1412, 14:20–15:7. Yamamoto discloses, to the contrary, that hard disk 71 is “mounted in image recording device 67,” which in turn is attached to the camera. Ex. 1401, 23:61–64, 7:54–60. Thus, we find that Yamamoto discloses that hard disk 71 is removable from the camera, but Yamamoto does not require the disk to be independently connectable to an external computer.

Finally, we do not agree with Patent Owner’s assertion that, even if the camera components were involved in the data transfer process, a person of ordinary skill in the art would have understood system control circuit 20 to be uninvolved. Again, Mr. Gafford’s testimony on this issue describes that it is “*reasonable to assume*” that a person of ordinary skill would understand from Yamamoto’s disclosure only the best and most efficient path the camera’s internal components would use. Ex. 2006 ¶ 93 (emphasis added). Using this understanding, Patent Owner asserts that a person of ordinary skill “would not modify Yamamoto to use the system control circuit 20 . . . to transfer files from hard disk 71.” PO Resp. 36. But we find that any such “modification” of Yamamoto would be unnecessary.

Instead, a person of ordinary skill in the art would understand from Yamamoto's disclosure that system control circuit 20 would certainly be available as an integral part of the data transfer process.

Based on the this record, we are persuaded that Petitioner has shown, by a preponderance of the evidence, that the prior art combination teaches that Yamamoto's system control circuit is (1) "configured and programmed to execute at least one other instruction set . . . to thereby allow the at least one file . . . to be transferred to the computer" as recited by claim 1, and (2) "configured to automatically transfer the digitized analog data . . . to the host device" as recited by claim 31.

First and Second Computer (claim 86)

As discussed above, claim 86 recites automatic recognition and data transfer limitations. Additionally, claim 86 requires that those limitations take place on both "a first computer" and "a second computer that is manufactured by a company other than the company that manufactured the first computer." Ex. 1400, 17:39–18:19, 18:2–34. As noted above, after institution, the parties agree to construe "a second computer that is manufactured by a company other than the company that manufactured the first computer" as "regardless of the identity of a manufacturer of the computer." PO Resp. 15; Reply 25. Therefore, it is not necessary for us to address the parties' arguments regarding whether applicant disavowed the first computer and second computer as limitations of the claim. Pet. 56–57. Instead, we are persuaded that, for the same reasons discussed below regarding the "regardless of the identity of a manufacturer of the computer," Petitioner has shown, by a preponderance of the evidence, that one of

ordinary skill in the art would have found this limitation obvious from the teachings of the asserted prior art.

Negative Limitations

Each of independent claims 1, 84, and 86 requires each automatic process—recognition and file transfer—to occur without requiring any end user to load any software or set up a file system, and to occur “regardless of the identity of a manufacturer of the computer.” Ex. 1400, 12:4–20, 12:24–36; 16:25–58; 17:39–18:19, 18:24–46.

Petitioner asserts that the asserted prior art renders these negative limitations obvious. Pet. 38–39, 44–46, 48–49. Specifically, Petitioner asserts that “Yamamoto discloses using standard SCSI drivers to communicate between the still video camera and external computer.” *Id.* at 38. Thus, “no end user is required to load any software onto the computer at any time because the existing SCSI device driver in the computer is used,” “a POSITA would understand that . . . a hard disk (such as hard disk 71) must have a file system on it in order for the user to be able to access files,” and Yamamoto’s camera “communicates with any generic external computer.” *Id.* at 38–39 (citing Ex. 1403 ¶¶ 96–99). Petitioner adds that “pre-formatted hard disks or floppy disks for certain computer platforms (e.g., MS-DOS) were well known during the relevant time.” *Id.* at 38 (quoting Ex. 1403 ¶ 97).

As support, Dr. Reynolds testifies that it was conventional at the time of the invention for a computer to request file system information by sending a SCSI READ command to read the disk drive’s “sector zero” information, as “sector zero” was an agreed upon location for the critical file system information of most file systems. Ex. 1403 ¶ 62. Dr. Reynolds points out

that it was known in the art that, before accessing a file on a hard disk, the computer would request a boot sequence and, in response, the camera would send a virtual boot sequence, which includes the starting position of the file allocation table and the number of sectors, to the computer. *Id.* ¶ 142.

Based on the record, a preponderance of the evidence supports a finding that a person of ordinary skill would have understood, from the teachings in the prior art references, that all negative limitations of independent claims 1, 84, and 86 would have been obvious over the asserted prior art. Patent Owner does not dispute Petitioner’s contentions regarding this limitation. *See generally* PO Resp.

Dr. Reynolds explains that according to the ’144 patent itself, when the communication between the host system and a device that is acting as a SCSI hard disk, is “based on *known standard access commands as supported by all known operating systems* (e.g., DOS®, Windows®, Unix®),” the device would provide to the host system, in response to a request for file system information, a virtual boot sequence, which “includes the drive type, the starting position and the length of the file allocation table (FAT), the number of sectors, etc., *known to those skill in the art.*” Ex. 1403 ¶¶ 76–79 (citing Ex. 1400, 5:17–44) (emphases added). Further, an ordinarily skilled artisan would have appreciated the following general knowledge regarding a file allocation table:

A [FAT is a] table or list maintained by some operating systems to manage disk space used for file storage. Files on a disk are stored, as space allows, in fixed-size groups of bytes (characters) rather than from beginning to end as contiguous strings of text or numbers. *A single file can thus be scattered in pieces over many separate storage areas. A file allocation table maps available*

disk storage space so that it can mark flawed segments that should not be used and can find and link the pieces of a file.

MICROSOFT COMPUTER DICTIONARY at 194 (3rd ed. 1997) (Ex. 3001) (emphases added). As Petitioner explains, Yamamoto's computer would acquire the file system information in order to use the file system on the camera's hard disk to read the image data files. Pet. 55.

Moreover, as we noted in the Institution Decision, the '144 patent confirms that SCSI interfaces and SCSI drivers were known in the art at the time of the invention. Ex. 1400, 8:45–50, 10:26–29. More significantly, the '144 patent also acknowledges that, at the time of the invention, SCSI interfaces were present on most host devices or laptops, and SCSI drivers were “normally included by the manufacturer of the multi-purpose interface.” *Id.* at 3:53–62, 8:45–46, 10:27–33. The '144 patent further indicates that communication between a host system and an interface device is based on known standard access commands, including the INQUIRY instructions, “as supported by all known operating systems (e.g., DOS®, Windows®, Unix®).” *Id.* at 5:11–14, 5:21–23.

Patent Owner does not cite to any evidence to the contrary in the record.

Based on the evidence in this record, we are persuaded that Petitioner has established, by a preponderance of the evidence, that it would have been obvious to one of ordinary skill in the art that Yamamoto's camera, acting as a SCSI hard disk, satisfies the required negative limitations.

Rationale to Combine

Petitioner asserts that a person of ordinary skill in the art would have been motivated to combine the teachings of the SCSI Specification and the camera described in Yamamoto because Yamamoto expressly describes its

camera communicating with an external computer through a SCSI interface. Pet. 26–27. According to Petitioner, a person of ordinary skill would have known that the SCSI Specification provides details on the functioning of the SCSI interface and such details would have been important to the functioning of Yamamoto’s camera as a SCSI hard disk, as described in Yamamoto’s Specification. *Id.* (citing Ex. 1403 ¶ 75). Moreover, because Yamamoto 2 is a patent describing similar subject matter, with the same assignee and overlapping inventorship, it would have been obvious to a person of ordinary skill in the art to look to both the teachings of both Yamamoto and Yamamoto 2.

We agree with Petitioner that a preponderance of the evidence supports a finding that person of ordinary skill in the art would have had a reason to combine the prior art teachings. Ex. 1403 ¶¶ 75–80. Patent Owner does not challenge Petitioner’s reasons to combine the prior art teachings. *See generally* PO Resp.

6. *Claims 2–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 78–83, 85, and 87*

Patent Owner does not address the limitations expressly recited in dependent claims 2–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 78–83, 85, and 87 with separate, specific arguments, but rather relies upon its arguments in connection with independent claims 1, 84, and 86. PO Resp. 37. We have addressed those arguments in our analysis above, and determine those arguments are likewise unavailing here.

Based on the evidence before us, we determine that the explanations and supporting evidence presented by Petitioner sufficiently show how Yamamoto, in combination with Yamamoto2, the SCSI Specification, and

the Admitted Prior Art, renders these claims obvious. Pet. 57–73; Ex. 1403 ¶¶ 148–195. For example, claim 7 recites “wherein the interface device includes a parallel logic circuit.” Ex. 1400, 12:49–50. Petitioner asserts that “[i]t was well known” to the relevant person of skill at the relevant time, that processors “could have dual logic circuits, including logic circuits that could operate in parallel.” Pet. 59. Thus, it would have been obvious to a person of ordinary skill that “Yamamoto’s micro-computer or micro-processor in system control circuit 20 may include a parallel logic circuit.” *Id.* (citing Ex. 1403 ¶ 155). We credit Dr. Reynolds’ testimony on this issue. Given Patent Owner does not dispute this testimony or point to any contrary evidence in the record, we determine that Petitioner has established, by a preponderance of the evidence, that one of skill in the art would have found the teachings of Yamamoto, in combination with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art, disclose the limitations recited in claim 7.

Similarly, we agree with Petitioner’s explanations and Dr. Reynolds’ testimony as to claims 2–6, 8, 13–17, 19, 31–40, 42–48, 52–55, 59, 61, 78–83, 85, and 87. Pet. 57–73; Ex. 1403 ¶¶ 148–195. We credit Dr. Reynolds’ testimony (Ex. 1403 ¶¶ 148–195) as it is consistent with the prior art in this record and we adopt his analysis as our own. Based on the evidence before us, we conclude that Petitioner has established by a preponderance of the evidence that claims 2–8, 13–17, 19, 31–40, 42–48, 52–55, 59, 61, 78–84, 85, and 87 are unpatentable under § 103(a) as obvious over Yamamoto in combination with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art.

7. Conclusion

We determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 78–87 are unpatentable as obvious under § 103(a) over Yamamoto in combination with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art.

E. Obviousness over Yamamoto, in Combination with Yamamoto 2, Muramatsu, the SCSI Specification, and the Admitted Prior Art

Petitioner asserts that claim 66 is unpatentable under § 103(a) as obvious over Yamamoto in combination with Yamamoto 2, Muramatsu, the SCSI Specification, and the Admitted Prior Art. Pet. 71–73. Claim 66 depends from claim 1, and further recites “wherein the analog data is . . . processed by being subject to a *fast Fourier transform*.” Ex. 1400, 15:27–29 (emphasis added). Patent Owner, in its Response, does not raise any separate argument with regard to claim 66 other than those already addressed above in connection with claim 1. PO Resp. 2 n.1 (“Papst does not separately address the limitations of dependent claim 66 apart from those of independent claim 1.”).

Based on the evidence in this record, a preponderance of the evidence supports Petitioner’s assertion that Muramatsu discloses the additional limitation recited in claim 66. Notably, Petitioner explains that Muramatsu discloses a camera photometric device that implements a *fast Fourier transform* during the analog data generation process. Pet. 71–72 (citing Ex. 1408, 3:50–63 (“The photometric computation device 8 is configured to include a spectral analysis unit 81 which implements a discrete two-dimensional Fourier transform operation.”), 4:21–25 (“If the number of

segments in the horizontal and vertical directions is a power of 2, the photometric sensor 7 can use a so-called fast Fourier transform (FFT) algorithm, so it can execute the computations in equations [1] and [2] at a high speed using conventional techniques.”)).

Dr. Reynolds testifies that using fast Fourier transform was widespread at the time of the invention. Ex. 1403 ¶ 199. Indeed, Muramatsu indicates that the discrete two-dimensional Fourier transform operation was “a common and well-known technique,” which can be applied “to determining brightness distribution of a photographic subject from a photometric sensor.” Ex. 1408, 3:52–57. Dr. Reynolds also testifies that it would have been obvious for an ordinarily skilled artisan to add fast Fourier transform capability, as taught by Muramatsu, to the image processing circuit, in Yamamoto, because fast Fourier transform can be performed very fast in hardware-based digital signal processors. Ex. 1403 ¶¶ 199–200.

Petitioner also asserts, with supporting testimony by Dr. Reynolds, that a person of ordinary skill in the art would have known to add a Fourier transform to the image processing circuit 63 of Yamamoto in order to efficiently transform the signal from the time domain to the frequency domain. Pet. 72 (citing Ex. 1403 ¶ 199). Accordingly, based on the evidence currently in this record, a preponderance of the evidence supports Petitioner’s articulated rationale to combine the teaching of Muramatsu with Yamamoto, as modified in view of Yamamoto, the SCSI Specification, and the Admitted Prior Art—that. See *KSR*, 550 U.S. at 417 (noting that “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the

same way, using the technique is obvious unless its actual application is beyond his or her skill”).

Accordingly, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 66 is unpatentable as obvious under § 103(a) over Yamamoto in combination with Yamamoto 2, Muramatsu, the SCSI Specification, and the Admitted Prior Art.

CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 78–87 of the ’144 patent are unpatentable under § 103(a) as obvious over Yamamoto, in combination with Yamamoto 2, the SCSI Specification, and the Admitted Prior Art. In addition, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 66 is unpatentable as obvious under § 103(a) over Yamamoto in combination with Yamamoto 2, Muramatsu, the SCSI Specification, and the Admitted Prior Art.

ORDER

Accordingly, it is

ORDERED that claims 1–8, 13–17, 19, 27–29, 31–40, 42–48, 52–55, 59, 61, 66, 78–87 of the ’144 patent are held unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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