

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC., and LG ELECTRONICS,
INC.

Petitioner,

v.

PAPST LICENSING GMBH & CO. KG,
Patent Owner.

Case IPR2016-01733¹
Patent 9,189,437 B2

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

¹ LG Electronics, Inc. (“LG”) filed a petition and motion to join this case in IPR2017-01038. We granted that motion and joined the two cases on April 11, 2017. Paper 10. Subsequently, LG and Patent Owner filed a joint motion to terminate the proceeding as to LG. Paper 22.

I. INTRODUCTION

Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (collectively “Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–45 (“the challenged claims”) of U.S. Patent No. 9,189,437 B2 (Ex. 1003, “the ’437 patent”). Paper 1 (“Pet.”). Patent Owner, Papst Licensing GmbH & Co., KG (“Patent Owner”), filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). We instituted this review as to all challenged claims. Paper 7 (“Inst. Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response. Paper 13 (“PO Resp.”). Petitioner filed a Reply. Paper 15 (“Reply”). A transcript of the oral hearing held on November 1, 2017, has been entered into the record as Paper 23 (“Tr.”).

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons that follow, Petitioner has demonstrated by a preponderance of the evidence that claims 1–38 and 43–45 of the ’437 patent are unpatentable, but not as to claims 39–42.

A. *Related Matters*

The parties indicate that the ’437 patent is involved in *Papst Licensing GmbH & Co. KG v. Canon Inc.*, Case No. 1:15-cv-01692 (D.D.C.) and other proceedings. Pet. 80–81; Paper 5, 2–3.

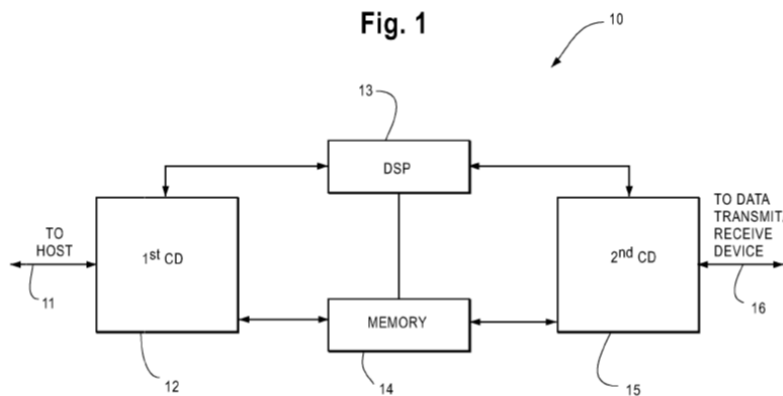
The ’437 patent has also been challenged in several other petitions for *inter partes* review. All but one of these petitions—IPR2016-01842—was denied. *See* IPR2016-01840; IPR2016-01841; IPR2016-01844; IPR2017-

00156; IPR2017-00712. IPR2016-01842 was instituted April 27, 2017 and is proceeding concurrently with this case.

B. The '437 Patent

The '437 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. 1003, 1:18–22, 1:54–57. According to the '437 patent, using a specific driver to match very closely to an individual host system would achieve high data transfer rates across the interface, but the 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 '437 patent indicates that the purported “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 utilized. *Id.* at 3:33–37. Figure 1 of the '437 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 the driver for the interface card. *Id.* at 3:51–57, 8:42–46. According to the '437 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.

C. Illustrative Claim

Of the challenged claims, claims 1, 39, 41, and 43 are independent. Claims 2–38 depend ultimately from claim 1; claim 40 depends from claim 39; claim 42 depends from claim 41; and claims 44 and 45 depend from claim 43. 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 processor operatively interfaced with the i/o port, the program memory and the data storage memory;

wherein the processor is adapted to implement a data generation process by which analog data is acquired from each respective analog acquisition channel of a plurality of independent analog acquisition channels, the analog data from each respective channel is digitized, coupled into the processor, and is processed by the processor, and the processed and digitized 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 of a host computer in which, when the i/o port is operatively interfaced with a multi-purpose interface of the host computer, the processor executes at least one instruction set stored in the program memory and thereby causes at least one parameter identifying the analog data generating and processing device, independent of analog data source, as a digital storage device instead of an analog data generating and processing device to be automatically sent through the i/o port and to the multi-purpose interface of the computer (a) without requiring any end user to load any software onto the computer at any time and (b) without requiring any end user to interact with the computer to set up a file system in the ADGPD at any time, wherein the at least one parameter is consistent with the ADGPD being responsive to commands issued from a customary device driver;

wherein the at least one parameter provides information to the computer about file transfer characteristics of the ADGPD;

and

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 sent from the i/o port to the multi-purpose interface of the computer, the processor executes at least one other instruction set stored in the program memory to thereby cause the at least one file of digitized analog data acquired from at least one of the plurality of analog acquisition channels to be transferred to the computer using the customary device driver for the digital storage device while causing the analog data generating and processing device to appear to the computer as if it were the digital storage device without requiring any user-loaded file transfer enabling software to be loaded on or installed in the computer at any time.

Ex. 1003, 11:57–12:42.

D. Prior Art Relied Upon

Petitioner relies upon the references listed below (Pet. 4–7).

Reference		Exhibit
Aytac	US 5,758,081, issued May 26, 1998	1004
Aytac's source code	Aytac's source code in U.S. Patent Application No. 08/569,846	Ex. 1006, 77–527
SCSI Specification	AMERICAN NATIONAL STANDARDS INSTITUTE, INC., AMERICAN NATIONAL STANDARD FOR INFORMATION SYSTEMS – SMALL COMPUTER SYSTEM INTERFACE-2, ANSI X3.131-1994 (1994)	1005
Adaptec	US 5,659,690, issued Aug. 19, 1997	1009

	Reference	Exhibit
Muramatsu	US 5,592,256, issued Jan. 7, 1997	1008
TI Data Sheet	“8-Bit Analog-to-Digital Converters With Serial Control and 19 Inputs (Rev. B),” SLAS066B, revised Oct. 1996 by Texas Instruments Inc., (available at http://www.ti.com/lit/ds/slas066b/slas066b.pdf)	1007
TI Patent	US 5,325,071, issued June 28, 1994	1013
Admitted Prior Art	<i>See, e.g.</i> , 1:25–3:25, 8:45–50, 10:26–33	1003

E. Asserted Ground of Unpatentability

We instituted *inter partes* review on the following grounds of unpatentability (Inst. Dec. 39–40):²

Challenged Claims	Basis	Reference(s)
1, 4–16, 18–31, 33–37, 41, 43, and 45	§ 103(a)	Aytac, the SCSI Specification and Admitted Prior Art ³

² 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.

³ Although the Admitted Prior Art is relied upon in the Petitioner’s analysis, of all challenged claims (1–45), the Admitted Prior Art is only mentioned in the ground relating to claim 41. Pet. 8. In the Institution Decision, we notified the parties that we treat the petition’s omission in the statement of the asserted grounds as harmless error and presume that Petitioner intended to assert that all the challenged claims are unpatentable based, in part, on the Admitted Prior Art. Inst. Dec. 7, n.2.

Challenged Claims	Basis	Reference(s)
2, 3, 17, 39, 40, 42, and 44	§ 103(a)	Aytac, the SCSI Specification, Admitted Prior Art, and Adaptec
32	§ 103(a)	Aytac, the SCSI Specification, Admitted Prior Art, and Muramatsu
13 and 45	§ 103(a)	Aytac, the SCSI Specification, Admitted Prior Art, and TI Data Sheet
38	§ 103(a)	Aytac, the SCSI Specification, Admitted Prior Art, TI Data Sheet, and TI Patent
40	§ 103(a)	Aytac, the SCSI Specification, Admitted Prior Art, Adaptec, and TI Data Sheet

II. 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). Claims of an *expired* patent are given their ordinary and customary meaning similar to the construction standard applied by the U.S. district courts. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); *In re Rambus Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012); *see also Black & Decker, Inc. v. Positec USA, Inc.*, 646 F. App'x. 1019, 1024 (Fed. Cir. 2012) (non-precedential) (applying the U.S. district court standard to construe the claims of an expired patent in an *inter partes* review). “In many cases, the claim construction will be the same under [both] standards.” *In re CSB-System Int’l, Inc.*, 832 F.3d 1335, 1341 (Fed. Cir. 2016).

Here, in the Institution Decision, we applied the broadest reasonable interpretation standard to construe several claim terms. Dec. 8–14. Patent Owner, however, represents that the '437 patent will expire on March 3, 2018, shortly after the deadline for a final written decision in this case—February 8, 2018. PO Resp. 21. Both parties assert that, because the '437 patent does not expire prior to our decision deadline, the broadest reasonable interpretation standard is applicable. *Id.*; Reply 3, n.3. Patent Owner notes that its proposed constructions are the same under either standard. *Id.* at 22. Petitioner proposes slightly different constructions for “automatic recognition process” and “without requiring any end user to load software.” Reply 3.

We agree with Petitioner that any potential difference between the two standards would not affect the outcome of this Decision. Reply 3, n.3. Indeed, in the Institution Decision, we adopted with modifications, as the broadest reasonable interpretation of several claim terms, the claim construction proposed by Patent Owner in the related district court litigation. Pet. 9–11; Ex. 1014; Inst. Dec. 8–14.

Both Petitioner and Patent Owner mostly agree with our claim constructions set forth in the Institution Decision. PO Resp. 24–32; Reply 3–9. We address, below, the construction of certain terms 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); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

1. “*multi-purpose interface*”

Each independent claim recites “a multi-purpose interface of the computer.” Ex. 1003, 12:9, 15:28–29, 16:10–11, 16:52–53. The Specification of the ’437 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 system.” Ex. 1001 ¶ 50.

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. 8–9. Patent Owner objects to this construction in the event that a multi-purpose interface is limited to a SCSI interface. PO Resp. 24. 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.”

2. “*automatic recognition process*”

Independent claim 1 requires the processor to be adapted to be involved in an “automatic recognition process,” sending “at least one parameter identifying the [ADGPD], independent of analog data source, as a digital storage device instead of as an [ADGPD]” to the multi-purpose interface of the computer. *See, e.g.*, Ex. 1003, 12:6–23 In the Institution Decision (Inst. Dec. 9–10), 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 ’437 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. 1003, 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. Dec. 9. The parties do not disagree with this construction. PO Resp. 25; Reply 4–7 (asserting that

Patent Owner implicitly, and improperly, attempts to add limitations to this term in the analysis portion of its decision)⁴. For this Final Decision, we maintain our claim construction as to “automatic recognition process.”

3. “*automatic file transfer process*”

Independent claim 1 requires the processor to be adapted to be involved in an “automatic file transfer process,” sending a digitized analog data file to the computer. Ex. 1003, 12:27–42. 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. 1003, 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.”).

Patent Owner does not explicitly address the construction of this term in its Response. Petitioner, however, argues that Patent Owner implicitly construes this term by requiring the ADGPD to “reliably transfer data.” Reply 4–7.

Similar to the term “automatic recognition process,” we construe “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. We discuss Petitioner’s argument regarding Patent Owner’s implicit construction of this term in our analysis below.

⁴ We address Petitioner’s arguments on this issue in the analysis section of this Decision.

4. “without requiring”

Each independent claim recites at least one negative limitation. 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. 1003, 12:27–42. Claim 43 similarly requires transferring digitized data “without requiring the user to load the device driver.” *Id.* at 17:3–10.

For these claim limitations, 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. 16; Pet. 9 (citing Ex. 1014) (emphasis added). However, in light of the Specification, in our Institution Decision 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. 10–12. Thus, 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.* at 12.

After institution, Petitioner agrees with our claim construction and urges us not to adopt a new construction. Reply 7. 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. 25–26. Patent Owner’s argument and Mr. Gafford’s testimony (Ex. 2006 ¶ 49) 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. 1003, 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 21, which depends from claim 1, also requires a SCSI driver to issue a SCSI INQUIRY command. *Id.* at 13:64–67. 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.*"

5. “*end user*”

Independent claim 1 recites “without requiring any *end user* to load any software onto the computer at any time,” and “without requiring any *end user* to interact with the computer to set up a file system in the ADGPD at any time.” Ex. 1003, 12:17–20 (emphasis added).

In the Institution Decision (Dec. 12–14), we gave the claim term “end user” its ordinary and customary meaning—“[t]he ultimate user of a computer or computer application in its finished, marketable form”—citing two dictionary definitions. Dec. 14; *see also* MICROSOFT COMPUTER DICTIONARY at 176 (3rd ed. 1997) (Ex. 3001, 3) (defining “end user” as “[t]he ultimate user of a computer or computer application in its finished, marketable form”); BARRON’S DICTIONARY OF COMPUTER AND INTERNET TERMS at 158 (6th ed. 1998) (defining “end user” as “the person ultimately intended to use a product, as opposed to people involved in developing or marketing it”), 453 (defining “system administrator” as “a person who manages a multiuser computer”) (Ex. 3002, 3). We rejected Patent Owner’s argument that the claim term “end user” should not be limited to “actual end user,” but instead should include a “system administrator” who sets up a computer for another or “a technically competent individual who understood how to install device drivers.” Prelim. Resp. 21–26.

After Institution, Patent Owner “maintains the ‘end user’ requires no construction and that the Board’s cited definition is consistent with the ordinary meaning of ‘end user’ as it is used in the ’437 patent.” PO Resp. 26–27. Nonetheless, Patent Owner argues that the term “end user” “encompasses a ‘system administrator’ or a ‘technically competent person’”

because both “are ultimate users of a computer in its finished and marketable form.” *Id.* at 30.

We agree, however, with Petitioner, that it is unnecessary to resolve this dispute about the exact scope of the term “end user.” *See* Reply 4, n.4. The analysis below turns on the question of whether software need be installed at all, not on whether the installation is done by an end user or not.

Thus, we maintain our construction, giving the claim term “end user” its ordinary and customary meaning—“[t]he ultimate user of a computer or computer application in its finished, marketable form.” Ex. 3001, 3.

6. “*an analog to digital converter operatively coupled to the digital processor and configured to simultaneously acquire analog data from each respective analog source*”

Independent claim 41 recites, as part of the ADGPD, “*an analog to digital converter operatively coupled to the digital processor and configured to simultaneously acquire analog data from each respective analog source.*” Ex. 1003, 16:13–21 (emphases added).

In the preliminary portion of this trial, neither party proposed an explicit construction for this limitation and we did not address the term in the Institution Decision. *See* Pet.; Prelim. Resp.; Inst. Dec. Patent Owner’s Response also does not explicitly propose a construction for this term. However, in its analysis, Patent Owner asserts that claim 41 “requires a single A/D converter to ‘simultaneously acquire analog data from each respective analog source.’” PO Resp. 59. Petitioner characterizes this assertion as “import[ing] a *single* A/D converter into [the] limitation.” Reply 7–8.

Because we agree that Patent Owner's argument is, at least partially, an argument regarding the construction of the term "an analog to digital converter . . . simultaneously acquir[ing] analog data from each respective analog source," we address the issue here.

At oral argument, Patent Owner clarified its proposed construction of this limitation, explaining that there has to be a single analog to digital converter that is "configured to [simultaneously] acquire analog data from each respective analog acquisition channel of a plurality of analog acquisition channels." Tr. 11:26–12:4 (emphasis added). Further, Patent Owner does not disagree that "*an* analog to digital converter" means "one or more" analog to digital converters, however, according to Patent Owner *each* of the potential multiple converters "would need to be configured to [simultaneously] acquire analog data from each of the plurality of analog sources." *Id.* at 12:9–13.

Petitioner disagrees, pointing out that the claim uses the phrase "an analog to digital converter," which normally means "at least one" or "one or more." Reply 7–9. Petitioner adds that the claim language does not require each analog to digital converter to acquire data from multiple analog sources, but instead each converter can acquire data from one analog source, and working in parallel, meet the requirement for simultaneously acquiring from multiple analog sources. Tr. 17:4–7.

The answer to this dispute clearly lies in the language of the claim itself. The question being, whether the phrase "configured to simultaneously acquire analog data from each respective analog source" is so tightly coupled to the phrase "analog to digital converter" that the article "an,"

while allowing for more than one converter per ADGPD, requires each such converter to be configured in the recited manner. We are persuaded that, while this is a close issue, Patent Owner's reading is the more natural.

We see at least two reasons for this conclusion. First, as conceded by Petitioner, "an analog to digital converter" means "at least one" converter. *See Reply 7–9*. By definition, then, the claim encompasses the circumstance when there is only one converter. In that case, it is indisputable that the one converter would be required to "acquire analog data from each respective analog source of a plurality of analog sources." Thus, both of the proposed readings encompass a circumstance when one analog to digital converter is required to simultaneously acquire analog data from multiple sources. Second, to get to Petitioner's proposed interpretation, we must read at least one word into the claim that is not there. Specifically, Petitioner's interpretation would require the claim language to include more than one converter "coupled to the digital processor and [*together*] configured to simultaneously acquire analog data from multiple analog sources."

Second, Petitioner appears to agree that the clause preceding the "and" in the language at issue means that if the ADGPD includes more than one analog to digital converter, *each* of the multiple converters is "operatively coupled to the digital processor." *See Pet. 68* ("A POSITA would know this and that the ADC converters must be 'coupled' to the processor."). However, according to Petitioner, the clause following the "and" does not require *each* of the multiple converters to be "configured to simultaneously acquire analog data from each respective analog source." *Reply 7–9; Tr. 17:4–7*. Instead, according to Petitioner, the multiple

converters can be read *as a group* to be “configured to simultaneously acquire analog data from each respective analog source.” Petitioner does not point to any portion of the Specification that would support such a reading. *See Reply 7–9*. We decline to read words into the claim without any indication from the Specification that we should do so. *See Source Vagabond Sys. Ltd. V. Hydrapak, Inc.*, 753 F.3d 1291, 1299–1300 (Fed. Cir. 2014) (“[A]n ‘analysis’ that adds words to the claim language . . . does not follow standard canons of claim construction.”) (internal quotation marks omitted).

Thus, we agree with Patent Owner and interpret “an analog to digital converter operatively coupled to the digital processor and configured to simultaneously acquire analog data from each respective analog source” to require at least one analog to digital converter that is configured to simultaneously acquire analog data from multiple analog sources. Our interpretation also is the one that more naturally comports with the Specification’s only embodiment of the ADGPD, where an ADC (coupled to the digital signal processor) is fed eight different inputs, each input corresponding to an analog source. Ex. 1003, 8:60–9:8, Fig. 2. “The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998).

Independent claim 39 also recites “an analog to digital converter operatively coupled to the digital processor and configured to acquire analog data from each respective analog acquisition channel.” Ex. 1003, 15:31–39.

Because claim 39's limitation does not include the word "simultaneously," Petitioner does not include claim 39's variant of this limitation in its claim construction discussion. Reply 7–9. However, Petitioner relies on the same analysis for both claim 39 and claim 41. Reply 25. Moreover, Patent Owner also argues that claim 39's limitation requires "a single A/D converter that acquires analog data from each of a plurality of independent analog acquisition channels." PO Resp. 62.

We agree with Patent Owner that the claim construction of the analog to digital converter limitation of claim 39 is the same as for that limitation in claim 41. The word "simultaneously" does not change the analysis of the words of the limitation. Thus, for the reasons discussed above, we interpret "an analog to digital converter operatively coupled to the digital processor and configured to acquire analog data from each respective analog source" to require at least one analog to digital converter that is configured to acquire analog data from multiple analog sources.

B. 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 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. 14–15), 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. 1001 ¶ 40. 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, alternative, five or more years of experience without a bachelor’s degree. Prelim. Resp. 15–16; PO Resp. 23; Ex. 2006 ¶ 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. *See* PO Resp. 23. More importantly, no argument presented hinges on whether either party’s proposed level of ordinary skill in the art is adopted. *Id.*

We find Dr. Reynolds’ testimony persuasive as it presents more than just the educational level of a person of ordinary skill in the art. Petitioner’s proposal is more 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. 1001

¶ 40. We therefore determine that Petitioner's level of ordinary skill in the art is appropriate. We further note that the prior art in the instant 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).

C. Obviousness over Aytac, the SCSI Specification, and Admitted Prior Art

Petitioner asserts that claims 1, 4–16, 18–31, 33–37, 41, 43, and 45 are unpatentable under § 103(a) as obvious over Aytac, in combination with the SCSI Specification and Admitted Prior Art, which supply additional details about the SCSI standard not made explicit in Aytac. Pet. 21–68.

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. 1001). Notably, Petitioner notes that Aytac describes its preferred embodiment as emulating a SCSI disk and expressly references the SCSI Specification. *Id.* at 21–22 (citing Ex. 1004, 4:49–53).

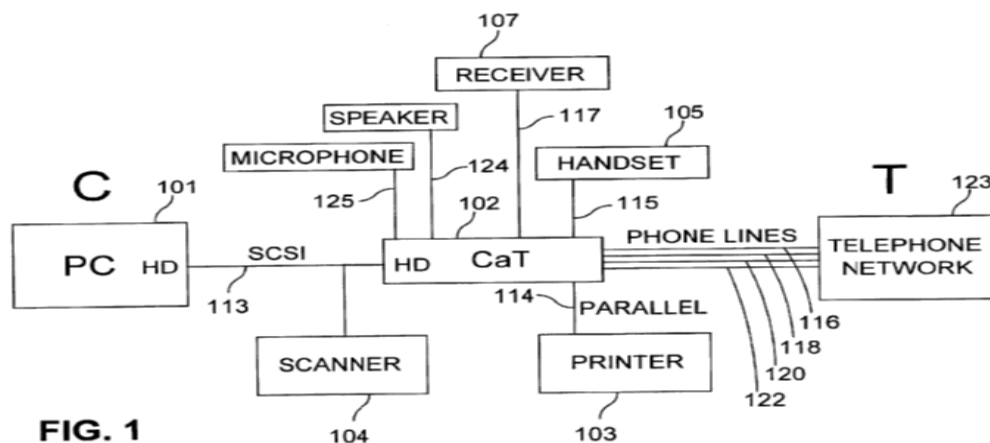
Patent Owner does not challenge Petitioner's reasons to combine the prior art teachings, but nevertheless argues that Petitioner fails to show the prior art combination discloses certain claim limitations. PO Resp. 21–68.

Upon consideration of the parties' contentions and supporting evidence, we determine that Petitioner has demonstrated by a preponderance of the evidence that Aytac, in combination with the SCSI Specification and Admitted Prior Art, renders obvious claims 1, 4–16, 18–31, 33–37, 43, and 45, but not claims 41 and 42. In our discussion below, we begin with a brief

overview of the prior art, and then we address the parties' contentions in turn, focusing on the disputed claim limitations.

1. Overview of Aytac

Aytac discloses an interface device (CaTbox) that is connected to a host PC and a plurality of peripheral devices. Ex. 1004, Abs. Figure 1 of Aytac is reproduced below.



As illustrated in Figure 1 of Aytac, CaTbox 102 connects to host PC 101 via SCSI bus 113 and telephone network 123 via phone lines 116, 118, 120, 122. *Id.* at 8:63–9:4. CaTBox 102 is an interface device between host PC 101 and peripheral devices, including printer 103, scanner 104, telephone handset 105, receiver 107, speaker 124, and microphone 125. *Id.* According to Aytac, CaTbox runs an operating system, CaTOS, and contains a hard disk accessible to the PC, as a SCSI disk called CaTdisc. *Id.* at Abs. CaTbox receives faxes, voice mails, emails, and stored them on CaTdisc. *Id.*

2. 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. 1005, 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.

3. *Overview of the Admitted Prior Art*

According to the '437 patent, drivers for hard disks were known to be customary drivers “in practically all host devices.” Ex. 1003, 3:37–46, 4:20–22. The '437 patent 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. 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 8:45–46, 10:27–33. Moreover, certain standard access commands, including the SCSI INQUIRY command, were “supported by all known operating systems (e.g., DOS®, Windows®, Unix®).” *Id.* at 5:11–14, 5:21–23, 5:37–47. The '437 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), 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. 20. Patent Owner particularly refers to the portion of the Specification that describes (1) the possibility of integrating drivers into BIOS, at column 3, lines 64–67 (Ex. 1003), and (2) sending a virtual boot sequence, at column 5, lines 37–47 (*Id.*). PO Resp. 20. Patent Owner’s argument is conclusory.

First, the portion of the Specification at column 3, lines 64–67 states “[r]ecently however drivers for multi-purpose interfaces can also already be integrated in the BIOS system of the host device.” Ex. 1003, 3:64–67. Second, the portion of the Specification at column 5, lines 37–47 describes “sending to the host device a virtual boot sequence which, in the case of actual hard drives, includes the drive type, the starting position and the length of the file allocation table (FAT), the number of sectors, etc., *known to those skilled in the art.*” *Id.* at 5:37–47 (emphasis added). Both of these statements convey that applicant deemed known that (1) drivers for multi-purpose devices can be integrated into a BIOS system, and (2) the virtual boot sequence of a hard drive, when sent, includes various pieces of information such as the drive type, the starting position and the length of the FAT, and the number of sectors. At a minimum, we infer that the applicant admits a person of skill in the art would have known this information at the time of the invention. Such statements are therefore admissions by applicant that the knowledge was in the prior art.

Moreover, the Specification also indicates that “[c]ommunication between the host system or host device and the interface device is based on *known standard access commands as supported by all known operating system (e.g., DOS®, Windows®, [and] Unix®).*” Ex. 1003, 5:11–14. Dr. Reynolds testifies that “[f]or most computers, when a disk drive is found to be attached (e.g. via the SCSI INQUIRY exchange), and its geometry (number of blocks, blocksize) has been learned, the computer’s operating system will attempt to identify a bootable partition and/or file system information on the first section of the disk,” and “[t]his file system information will inform the computer about how to access files on the disk – in particular, where that information can be found.” Ex. 1001 ¶ 60 (citing Ex. 1010, 91). The Specification further indicates that “[t]hose skilled in the art know that communication between a processor and a hard disk consists of the processor transferring to the hard disk the numbers of the blocks or clusters or sectors whose contents it wishes to read,” and “[b]y reference to the FAT, the processor knows which information is contained in which block.” Ex. 1003, 6:20–25. The Specification explains *the plug-and-play standard*, in which the interface device simulates a hard disk to the host device, and the interface device is automatically detected and readied for operation when the host system is powered up or booted, was *increasingly in widespread use* at the time of the invention. *Id.* at 7:17–22. In view of the Specification and Dr. Reynolds’ testimony, we are not persuaded by Patent Owner’s argument that the statements described above are not admissions of prior art.

4. *Aytac's Source Code*

Petitioner asserts that Aytac's source code (Ex. 1006, 77–527) was filed on paper, as part of the original disclosure of the application that issued as Aytac's patent. Pet. 1. Petitioner alleges that Aytac's source code qualifies as prior art. *Id.*

In response, Patent Owner contends that Aytac's source code is not prior art under § 102(e) as to the challenged claims because it was not published with Aytac's patent and Aytac's patent does not contain a reference to the source code. Prelim. Resp. 36–41.

As noted in the Institution Decision (Inst. Dec. 17–20), we agreed with Patent Owner that Aytac's source code is not prior art under § 102(e) as to the challenged claims because it was not published with Aytac's patent and Aytac's patent does not contain a reference to the source code. We also found that Aytac's source code is not prior art under § 102(a) or § 102(b) as to the claims at issue.

After institution, Petitioner disagrees with our determination that Aytac's source code is not prior art, but indicates that “the source code merely supplements [the] Aytac [patent's] disclosure and is not necessary to any argument.” Reply 12 n.8. Because Petitioner agrees that the source code is not necessary to any argument, we decline to further address this issue and maintain our conclusion from the Institution Decision.

5. *Claims 1, 4–16, 18–31, 33–37, 43, and 45*

As noted above, Petitioner asserts that claims 1, 4–16, 18–31, 33–37, 41, 43, and 45 are unpatentable under § 103(a) as obvious over Aytac, in

combination with the SCSI Specification and Admitted Prior Art. Pet. 21–68. According to Petitioner, a person of ordinary skill would have known to combine the teachings of the SCSI Specification with the teachings of Aytac because “Aytac’s disclosure relies on, and expressly references, the SCSI Specification.” *Id.* at 21 (citing Ex. 1004, 4:49–53). Specifically, “Aytac describes its preferred embodiment as emulating a SCSI disk and specifically directs those skilled in the art to the SCSI Specification.” *Id.* at 21–22 (citing Ex. 1004, 4:49–53; Ex. 1001 ¶ 71). According to Petitioner, this is an explicit motivation to combine the two references, clearly showing a person of ordinary skill in the art would be led to combine the teachings of Aytac and the SCSI Specification. *Id.* at 22 (citing *Optivis Tech., Inc. v. Ion Beam Apps S.A.*, 469 F.3d 978, 990–91 (Fed. Cir. 2006)).

Based on the evidence before us, we are persuaded by Petitioner’s showing that to the extent any of the limitations of the challenged claims are not fully taught by Aytac, a person of ordinary skill in the art would have been led to augment Aytac’s disclosure with the teachings of the SCSI Specification as directed by the ’437 patent itself. Moreover, we are persuaded that a person of ordinary skill in the art would also augment the teachings of Aytac with the knowledge of the prior art as described by the ’437 patent—the Admitted Prior Art. For the limitations that are similarly recited in more than one of the challenged independent claims, the Petition treats the limitations as coextensive and identifies how the prior art is alleged to teach or suggest those limitations. To the extent the parties do not point out the differences in claim scope between the independent claims, we analyze their similarly recited limitations together.

a. An analog data generating and processing device

Claim 1 requires an “analog data generating and processing device,” which includes a processor, an input/output port, a program memory, and a data storage memory. Ex. 1003, 11:57–63. Claim 43 is a method claim that recites “an analog data device including a digital processor, a program memory and a data storage memory.” *Id.* at 16:50–53.

Petitioner asserts that Aytac, in combination with the SCSI Specification and the Admitted Prior Art, teaches or suggests this claim limitation. Pet. 23–24, 32–35, 40, 41, 44, 68–69. In particular, Petitioner takes the position that Aytac’s CaTbox and its peripheral devices jointly form an “analog data generating and processing device.” *Id.* at 11–15. Petitioner explains that the CaTbox receives inputs transmitted from various analog peripheral devices, including microphone, telephone receiver, telephone handset, scanner, and telephones via phone lines, and modems. *Id.* at 12. Petitioner also explains that CaTbox includes modems for converting between analog signals and digital representations of fax images, voice mail, and other types of data. *Id.* at 12–13. According to Petitioner, analog data inputted via telephone lines, scanner, and microphone are digitized and processed by CaTbox. *Id.* at 13; Ex. 1001 ¶¶ 41, 42. Petitioner further indicates that the CaTbox communicates with the host computer over a SCSI interface, via SCSI bus on behalf of the peripheral devices. *Id.* at ¶ 43.

Based on the evidence before us, we are persuaded by Petitioner’s showing that Aytac’s CaTbox along with one of the peripheral devices jointly form an “analog data generating and processing device.” Patent

Owner does not disagree with Petitioner's contentions regarding this limitation.

In view of the foregoing, we determine that Petitioner has established by a preponderance of the evidence that Aytac, in combination with the SCSI Specification and Admitted Prior Art, teaches or suggests an “analog data generating and processing device” having an interface device and sensors, as required by claims 1 and 43.

b. Data generation process

Claim 1 recites “wherein the processor is adapted to implement a *data generation process* by which analog data is acquired from each respective analog acquisition channel of a plurality of independent analog acquisition channels, the analog data from each respective channel is digitized, coupled into the processor, and is processed by the processor, and the processed and digitized analog data is stored in the data storage memory as at least one file of digitized analog data.” Ex. 1003, 11:64–12:5 (emphasis added). Claim 43 contains a similar limitation. *Id.* at 16:54–59 (“acquiring analog data on each respective analog acquisition channel of a plurality of independent analog acquisition channels, converting the acquired analog data to digitized acquired analog data, and coupling the digitized acquired analog data into the digital processor for processing by the digital processor”).

Petitioner asserts that independent analog acquisition channels are attached to the microphone, scanner, fax machines, and telephones connected to the CaTbox, in Aytac. Pet. 29 (citing Ex. 1001 ¶ 85). According to Petitioner, “[a] person skilled in the art would have known that a processor accesses these channels and can acquire data from each of its

peripherals, such as a microphone, on these analog acquisition channels.” Ex. 1001 ¶ 85 (citing Ex. 1004, Fig. 2, 8:64–9:15). Moreover, Petitioner relies on testimony from Dr. Reynolds, at paragraphs 85–87 (Pet. 28–31) that points out that modems receive the faxes, print them, or store them as files. Ex. 1001 ¶ 86. A fax may be viewed using a Windows fax program. *Id.* (citing Ex. 1004, 11:25–27). Dr. Reynolds opines that in the process of copying the fax input arriving through a modem, and storing it in the CaTdisc in a file, the “analog data is digitized, coupled into the CaTbox CPU, and processed.” *Id.* Dr. Reynolds applies the same argument for voicemail, where the analog source is a microphone in a handset, and is also received and stored as a file in the CaTdisc. *Id.* at 87 (citing Ex. 1004, 8:14).

Based on the evidence before us, we are persuaded that a preponderance of the evidence shows that Aytac in combination with the SCSI Specification and Admitted Prior Art teaches or suggests the “data generation process” limitation, as required by claims 1 and 43. Patent Owner does not disagree with the Petitioner’s contentions regarding this limitation.

c. Automatic recognition and file transfer processes

Claim 1 requires the processor to be involved in an *automatic recognition process*, sending identification information regarding the ADGPD to the multipurpose interface of the computer, and (2) an *automatic file transfer process*, sending a digitized analog data file to the computer. *See, e.g.*, Ex. 1003, 12:6–42. Claim 1 also requires the automatic recognition process to occur without requiring any end user to load any software or set up a file system and 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.” *Id.* Claim 43, similarly, recites an automatic file “automatically . . . transmitting to the host computer . . . an identification parameter” and “transferring the digitized acquired analog data” “using the customary device driver present for the customary digital storage device in the host computer without requiring the user to load the device driver.” *Id.* at 16:60–17:10.

Petitioner takes the position that Aytac, in combination with the SCSI Specification and Admitted Prior Art, renders these automatic process limitations obvious. Pet. 32–39. In particular, Petitioner asserts that automatic recognition of a peripheral device was known in the art at the time of the invention because, as described in the SCSI specification (Ex. 1005), the SCSI standard provides an effective specification for such a process. *Id.* at 32. Petitioner also notes that, in Aytac, the CaTbox simulates a SCSI disk to the host PC, and communicates with the host PC using a SCSI interface and SCSI cable. *Id.* at 32–33; Ex. 1004, 4:49–53, 7:61–62, 9:5–15. As support, Dr. Reynolds testifies that an ordinary skilled artisan would have recognized that, in light of the SCSI specification (Ex. 1005, 123–27), the CaTbox of Aytac would respond, involving its processor and RAM, to an INQUIRY command by sending identifying information about a simulated SCSI disk drive to the SCSI interface of the host computer. Ex. 1001 ¶ 93. In addition, Petitioner asserts that the prior art combination discloses the claimed “automatic file transfer process,” in that Aytac’s host PC can access and read the digitized data files on the CaTdisc

of the CaTbox, using the SCSI interface and SCSI READ command. Pet. 33.

Petitioner further explains that there is no need for the end user to load any software, including file transfer enabling software or device drivers, onto the computer because the SCSI drivers that enable the host computer to access the simulated SCSI hard disk of the CaTbox would have been installed prior to use of the computer by the end user. Pet. 37–38 (citing Ex. 1001 ¶ 99). Petitioner also indicates that there is no need for any end user to set up a file system because the CaTbox uses the MS-DOS operating system, which has its own file system. *Id.* at 38–39 (citing Ex. 1004, 6:42–46, 12:9–12; Ex. 1001 ¶¶ 103, 104).

Upon consideration of the entirety of the record, we are persuaded by Petitioner’s explanation and supporting evidence. In its Response, Patent Owner opposes, arguing that Aytac does not disclose the claimed automatic file transfer process. PO Resp. 35–56. Specifically, citing to Mr. Gafford’s testimony for support, Patent Owner contends that Aytac does not disclose the claimed automatic file transfer process because Aytac’s CaTbox requires specific user-loaded software (CATSYNC, CATCAS, and CATSER) to read files properly from the CaTdisc for the CaTbox to execute its intended multitasking purpose. *Id.* at 37–45 (Ex. 2006 ¶¶ 36–46). Patent Owner argues that Dr. Reynolds improperly modifies Aytac by suggesting that a user need not install CATSYNC. *Id.* at 45–47. Patent Owner also submits that, without CATSYNC, the CaTbox would be inoperable. *Id.* at 34–40. Patent Owner alleges that one of ordinary skill in the art would have had no reason to modify Aytac to not install its

specialized drivers when that would render it inoperable for its intended multitasking purpose. *Id.* at 48–54.

Patent Owner’s arguments and Mr. Gafford’s supporting testimony, however, are based on the premise that the “without requiring” limitation *prohibits* a user from installing *any data-handling software*. The term “without requiring” does not mean “prohibiting,” but rather, if the software is *not required for transferring a file* from the storage memory of the interface device to the host computer, then it does not matter whether an end user installs the software. *See Celsis*, 644 F.3d at 926–27. Even if we were to construe “without requiring” as “prohibiting,” the claims, at most, prohibit only a user from installing software to accomplish the recited processes such as identifying the analog data generating and processing device and transferring a file from a data acquisition channel to the host computer. The claim limitation is not so broad to include *any data-handling software*.

To be clear, the disputed limitation recites “at least *one file* of digitized analog data acquired from at least one of the plurality of analog acquisition channels to be *transferred to the computer . . . without requiring any user-loaded file transfer enabling software* to be loaded on or installed in the computer at any time.” Ex. 1003, 12:34–42 (emphases added). Similarly, claim 43 recites “*transferring the digitized acquired analog data . . . without requiring the user to load the device driver.*” As discussed above, we construe the “without requiring” limitation 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.*” See *supra* Section II.A.3.

There is no dispute that Aytac uses the SCSI protocol and Advanced SCSI Programming Interface (ASPI) drivers to transfer at least one file from the CaTdisc to the computer, similar to the preferred embodiment disclosed in the '437 patent. Ex. 1004, 4:49–53 (“CaTbox look like a disk to the PC”), 5:44–45, 5:58–61 (“The PC may not even have a hard disk: it could use the CaTdisc as a hard disk”), 6:16–21, 9:55–10:58; Ex. 1001 ¶¶ 100, 111–19; Pet. 59–60, 63–67; Ex. 1003, 8:42–50, 10:23–56, 11:14–19. Indeed, Mr. Gafford admits that Aytac’s “CaTbox would reliably transfer good data” when acting as “a remote hard disc for the PC.” Ex. 2006 ¶ 62. Mr. Gafford also confirms in his cross-examination testimony that ASPI drivers were known at the time of the invention to be *included normally by the manufacturer* of the multi-purpose interface, and this is consistent with the Admitted Prior Art. Ex. 1003, 10:29–33; Ex. 1016, 44:9–18. Dr. Reynolds testifies that the end user is not required to install the ASPI drivers, in Aytac. Ex. 1001 ¶ 100. We credit Dr. Reynolds’ testimony as it is consistent with the Admitted Prior Art and Mr. Gafford’s cross-examination testimony.

A person of ordinary skill in the art would have understood that Aytac discloses transferring at least one file from CaTdisc (a storage memory) in CaTbox (an interface device) to the host computer using the SCSI protocol and ASPI drivers (file transfer enabling software), *without requiring* an end user to install or load the ASPI drivers. See *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1361 n.3 (Fed. Cir. 2009). Therefore,

even if we were to apply Patent Owner’s proposed claim construction—e.g., interpreting “without requiring” as “prohibiting”—Aytac, in combination with the SCSI Specification and Admitted Prior Art, would teach or suggest the claimed file transfer process, as required by claims 1 and 43.

Patent Owner’s arguments also conflate the ASPI drivers (the file transfer enabling software) with other drivers (CATSYNC, CATCAS, and CATSER) to *prohibit* improperly a user from installing those other drivers. *See Celsis*, 644 F.3d at 926–27. Patent Owner does not show sufficiently why those other drivers are required for *transferring a file* from the CaTdisc to the host computer. Notably, those other drivers, in Aytac, merely provide additional functionalities—synchronization, cache clearing/disabling, enhanced reliability, and multitasking. Ex. 1004, 10:58–11:64. Mr. Gafford confirms in his cross-examination testimony that the claims do not require those additional functionalities. Ex. 1016, 52:7–10 (“Q. Does claim 1 of the ’144 patent specify any degree of reliability for the file transfer process? [Mr. Gafford’s answer:] It doesn’t speak to reliability. It just says it happens.”), 57:4–11. Indeed, those drivers or their functionalities are not recited expressly in the disputed limitation. It is well established that limitations not appearing in the claims cannot be relied upon for patentability. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982). Therefore, Patent Owner’s argument that Aytac requires specific user-loaded software to execute its intended multitasking purpose is misplaced.

Furthermore, we are not persuaded by Patent Owner’s argument that Dr. Reynolds improperly modifies Aytac by suggesting that a user need not install CATSYNC. Patent Owner draws the wrong inference from Dr. Reynolds’ testimony. Dr. Reynolds testifies that only the SCSI protocol and ASPI drivers are needed to transfer a file, similar to the ’437 patent. Ex. 1001 ¶¶ 100, 109–117. Dr. Reynolds also testifies that CATSYNC is “intended only to provide synchronization and coordination among multiple on-going activities between the host computer and the CaTbox/CaTdisc,” and this driver is *not required for reading data files from the CaTdisc* because, if it were not installed, the host computer’s requests to READ files would default to LUN 0, the logical unit number for the CaTdisc (Ex. 1004, 11:25–27). Ex. 1001 ¶ 101. Dr. Reynolds did not suggest modifying Aytac to not install CATSYNC, but rather was pointing out that Aytac discloses transferring a file from CaTdisc to the host computer using the SCSI protocol and ASPI drivers, regardless of whether CATSYNC was installed or not, and CATSYNC is not required *for the file transfer*. *Id.* ¶¶ 101, 109–117. We credit Dr. Reynolds’ testimony as it is consistent with the SCSI Specification and Admitted Prior Art. Ex. 1005; Ex. 1003, 3:37–46, 4:20–22, 5:11–14, 5:21–23, 5:37–47, 8:45–50, 10:26–33.

Patent Owner also incorrectly interprets Dr. Reynolds’ cross-examination testimony that CATSYNC is “involved in the file transfer,” as confirming that Aytac “discloses the need for user-loaded, specialized software on the host computer, contrary to the explicit requirements of the ’437 claims.” PO Resp. 42. Mere involvement in the file transfer process does not necessarily indicate that CATSYNC is a “file

transfer enabling software” for transferring a file to the host computer. As described in Aytac, CATSYNC “implements the synchronization between the operating system of PC 101 and that of CaTbox 102 that access the same CaTdisc 301.” Ex. 1004, 10:60–63. As noted above, Mr. Gafford confirms that these additional functionalities (e.g., synchronization and enhanced reliability) are not required by the claims. Ex. 1016, 52:7–10, 57:4–11. Dr. Reynolds testifies that only the SCSI protocol and ASPI drivers are needed, in Aytac, to transfer a file from the CaTdisc to the computer, similar to the ’437 patent. Ex. 1001 ¶¶ 101, 109–120.

Dr. Reynolds also testifies that CATSYNC is not required for reading data files from the CaTdisc. Ex. 1001 ¶ 101. In fact, Mr. Gafford admits that, without using CATSYNC, Aytac’s “CaTbox would reliably transfer good data” when acting as “a remote hard disc for the PC.” Ex. 2006 ¶ 62.

Based on the evidence before us, we find that CATSYNC is *not a file transfer enabling software that is required for transferring a file* from CaTdisc to the host computer, contrary to Patent Owner’s interpretation of Dr. Reynolds’ cross-examination testimony and Aytac’s disclosure.

Therefore, even if we were to interpret “without requiring” as “prohibiting,” the claims do not *prohibit* a user from installing CATSYNC. Patent Owner’s argument that, without CATSYNC, the CaTbox would be inoperable is without merit.

We also are not persuaded by Patent Owner’s argument that one of ordinary skill in the art would have had no reason to modify Aytac to not install the additional drivers when that would render it inoperable for its intended multitasking purpose. PO Resp. 48–54. Petitioner did not propose

such modification in its Petition or Reply. Pet. 37–38; Reply 13–18. More importantly, such modification is not required for rendering the claims obvious. As discussed above, the ASPI drivers are the only file transfer enabling software needed for transferring a file to the host computer, similar to the '144 patent. *See, e.g.*, Ex. 1004, 4:49–53; Ex. 1001 ¶¶ 101, 109–117; Ex. 2006 ¶ 62. Patent Owner improperly assumes removing the additional drivers (e.g., CATSYNC) is necessary, in Aytac, because its arguments rest on the premise that the “without requiring” limitation *prohibits* a user from installing *any data-handling software*. Once again, Patent Owner relies upon its improper proposed claim construction and incorrect interpretation of Dr. Reynolds’ testimony and Aytac’s disclosure. Therefore, Patent Owner’s argument that the modification of removing the additional drivers would render Aytac’s system inoperable for its intended purpose is inapposite.

For the foregoing reasons, we conclude that Petitioner has established by a preponderance of the evidence that Aytac, in combination with the SCSI Specification and the Admitted Prior Art, teaches or suggests transferring a file from the storage memory of the interface device to the computer without requiring any user-loaded file transfer enabling software or device drivers, as recited in claims 1 and 43.

d. Dependent Claims 4–7, 9–16, 18–31, 33–37, and 45

Claims 4–7, 9–16, 18–31, and 33–37 depend directly or indirectly from claim 1. Claim 45 depends from claim 43. Petitioner discusses the additional limitations added by the dependent claims and where they are

shown in the cited prior art references. Pet. 45–68. Patent Owner does not argue these claims independently, but relies on its arguments for claim 1. PO Resp. 63–64. We have addressed those arguments in our analysis above, and determine those arguments are likewise unavailing here.

We also have considered Petitioner’s explanation and supporting evidence as to these remaining claims. Based on the evidence before us, we determine that the explanations and supporting evidence presented by Petitioner sufficiently show how Aytac, in combination with the SCSI Specification and Admitted Prior Art, renders these claims obvious. Pet. 74–90; Ex. 1001 ¶¶ 123–148. For example, Petitioner relies on Aytac to show the limitation “wherein each of the plurality of analog acquisition channels are independently programmable and further comprising a plurality of corresponding sample and hold amplifiers [configured to] simultaneously sample on the plurality of analog acquisition channels” recited by claims 13 and 45. *Id.* at 52–53. Specifically, Petitioner points to the step tables of Aytac as evidence that a person of ordinary skill would have recognized that the analog acquisition channels of Aytac are independently programmable. *Id.* (citing Ex. 1004, 8:20–22; Ex. 1001 ¶¶ 159–160). In addition, Petitioner asserts that it was “well known at the time of the alleged invention . . . to incorporate sample and hold amplifiers as part of the A/D converters for each analog source and that such sample and hold circuitry was integral to reliable conversion.” *Id.* at 53 (citing Ex. 1001 ¶¶ 154, 155; Ex. 1007).

Based on the evidence before us, we credit Dr. Reynolds’ unrebutted testimony and are, therefore, persuaded by Petitioner’s showing. Therefore, we determine that Petitioner has establish by a preponderance of the

evidence that Aytac, in combination with the SCSI Specification and Admitted Prior Art, discloses the limitation recited in claims 4–7, 9–16, 18–31, 33–37, and 45.

6. *Claim 8*

Claim 8 depends from claim 1 and recites “wherein data transfer between the analog data generating and processing device and the host computer is enabled by a hard disk driver program which is matched to the host computer and part of a manufacturer installed BIOS of the host computer.” Ex. 1003, 12:65–13:5.

Petitioner asserts that a person of ordinary skill “would have known that multi-purpose interfaces were already integrated into the BIOS of host devices, especially when considering accommodation of multi-purpose interfaces in host devices.” Pet. 48; Ex. 1001 ¶ 143. Additionally, Petitioner asserts that this limitation is “admitted prior art” based on the ’437 patent’s statement that “recently . . . drivers for multi-purpose interfaces can also already be integrated in the BIOS system of the host device as, alongside classical input/output interfaces, multi-purpose interfaces are becoming increasingly common” and “[f]or persons skilled in the art it is however obvious . . . that a special BIOS routine or a driver for a multi-purpose interface can also be started on the host device.” *Id.* at 48–49 (quoting Ex. 1003, 3:64–67, 7:27–31).

Patent Owner argues that “Aytac fails to disclose using a hard disk driver program for data transfer that is part of a manufacturer installed BIOS because it discloses using the ASPIDISK driver, which is provided by

Adaptec and is not part of the manufacturer installed BIOS.” PO Resp. 63 (citing Ex. 2006 ¶ 75). Further Patent Owner argues that the statements in the ’437 patent merely show “that drivers for multipurpose interfaces *could* be . . . integrated” in the BIOS system of the host device, but not that such integration was well-known technology. *Id.* at 60. Finally, Patent Owner argues that Aytac’s specific software (such as CATSYNC.VXD) would not be present in the manufacturer-installed BIOS. *Id.*

We find that the evidence shows that ASPI drivers are “normally included by the manufacturer of the multi-purpose interface” (Ex. 1003, 10:23–33) and “can also already be integrated in the BIOS system of the host device” (*id.* at 3:64–4:1). Dr. Reynolds agrees, stating “I agree that multi-purpose interfaces were already integrated into the BIOS’s of host devices at the priority date of the ’437 patent.” Ex. 1001 ¶ 144. Thus, a preponderance of the evidence supports a finding that a person of ordinary skill would find this limitation obvious in view of Aytac, the SCSI Specification, and the Admitted Prior Art. And, as discussed above, we do not agree with Patent Owner’s contention that Aytac requires specific software for file transfers. Accordingly, we conclude that Petitioner has shown by a preponderance of the evidence that claim 8 would have been obvious in view of Aytac, the SCSI Specification, and the Admitted Prior Art.

7. Claim 41

Independent claim 41 recites many similar limitations to those discussed above with respect to claims 1 and 43. For the reasons explained below, we are not persuaded that Petitioner has shown by a preponderance

of the evidence that the additional limitations of claim 41 would have been obvious over Aytac, the SCSI Specification, and the Admitted Prior Art.

Claim 41 recites two limitations not present in claims 1 and 43. First, claim 41 recites “an analog to digital converter operatively coupled to the digital processor and *configured to simultaneously acquire analog data* from each respective analog source.” Ex. 1003, 16:13–20. Second, claim 41 recites a “customary device driver present in the BIOS of the host computer.” *Id.* at 16:36–37. Patent Owner argues that Petitioner fails to show that these limitations are disclosed by Aytac. PO Resp. 56–60. Patent Owner also refers to the same arguments it made with respect to claim 1. *Id.* at 61.

Petitioner asserts that claim 41’s analog to digital converter “is necessarily present in Aytac because each analog signal would need to be digitized before CaTbox could process the data.” Pet. 68 (citing Ex. 1001 ¶ 119). Thus, Petitioner posits that “each analog source . . . would have an associated analog to digital converter.” Ex. 1001, ¶ 119. In addition, Dr. Reynolds testifies that a person of ordinary skill in the art would “know that the analog to digital converters for different analog channels could operate independently and simultaneously.” *Id.*

Patent Owner does not agree that this configuration of several analog to digital converters, each one of which is associated with an analog source, satisfies the required limitation. Instead, Patent Owner argues that claim 41 requires at least one analog to digital converter that, by itself, acquires data (simultaneously) from multiple analog sources. PO Resp. 56–60. As discussed above, we agree with Patent Owner’s interpretation of the scope of

claim 41. *See supra* Section II.A.6. Thus, we agree that Petitioner must show that a person of ordinary skill in the art would understand that the asserted references teach or suggest at least one analog to digital converter configured to simultaneously acquire analog data from multiple analog sources.

We also agree with Patent Owner that Petitioner did not sufficiently show that such an analog to digital converter would be obvious in view of Aytac, the SCSI Specification, and the Admitted Prior Art. Petitioner relies on a person of ordinary skill understanding that every analog source would have an associated analog to digital converter to acquire data from that source. Pet. 68; Ex. 1001 ¶ 119; Reply 7–9, 23 (“Because each connected device could have its own A/D converter, a ‘POSITA would also know that the analog to digital converters for different analog channels could operate independently and simultaneously.”).⁵

Accordingly, we conclude that Petitioner has not shown by a preponderance of the evidence that claim 41 would have been obvious in

⁵ In a footnote of its Reply, Petitioner asserts a new argument that “providing a single A/D converter would have been obvious.” Reply 24, n.14 (citing Ex. 2008 (Dr. Reynolds’ deposition testimony), 48:5–23 (referring to “a multiplex A-to-D converter”). This is a significant shift in the obviousness theory presented in the Petition. Because Petitioner relies on the possibility of a multiplex converter for the *first time* in its Reply (and there only in a footnote), we are not convinced that Patent Owner had fair notice of this position or a proper chance to respond. We, therefore, do not address this particular argument.

view of Aytac in combination with the SCSI Specification and the Admitted Prior Art.

D. Obviousness Assertions Further Including Adaptec

Petitioner asserts that claims 2, 3, 17, 39, 40, 42, and 44 are unpatentable under 35 U.S.C. § 103(a) as obvious over Aytac in combination with the SCSI Specification, Admitted Prior Art, and Adaptec. Pet. 69–74. Claims 2, 3, and 17 depend from directly or indirectly from claim 1. Claim 39 is independent and claim 40 depends from claim 39. Claim 42 depends from claim 41 and claim 44 depends from claim 43.

1. Overview of Adaptec

Adaptec discloses a “one chip high performance host adapter for connecting” buses using different protocols. Ex. 1009, Abs. It includes a processor. *Id.* at Abs., 8:55–65. The host adapter “performs data transfers between the two buses or between two SCSI devices with greater speed than prior art host adapter circuits.” *Id.* at 9:2–6.

2. Claim 39

Petitioner relies primarily on its analysis of claim 1 to show unpatentability of claim 39. Pet. 69. Petitioner, however, relies on Adaptec to show claim 39’s recited limitation “wherein the digital processor is configured to transmit to the host computer active commands through the multi-purpose interface to access a system bus of the host computer to enable communication directly with other devices of the host computer while bypassing the host computer processor.” Pet. 69–71. Petitioner refers to the technique described by the limitation as “bus mastering” and asserts that this feature “was well-known in the art.” *Id.* at 69 (citing Ex. 1001

¶¶ 118, 120, 121). Specifically, Petitioner cites to Adaptec’s statement that its host adaptor supports “many features found in traditional add-in card SCSI host adapters,” including “bus master transfers, fast/wide SCSI, one interrupt per command, scatter/gather, overlapped seeks, tagged queuing, etc.” *Id.* at 69–70 (quoting Ex. 1009, 4:57–61). Petitioner asserts that a person of ordinary skill “would have known that SCSI commands (or, more precisely, ASPI commands) . . . would allow SCSI devices to send data to other SCSI devices, including a SCSI host adaptor, which could then forward data or commands to other devices on the system bus through bus-mastering.” *Id.* at 70 (citing Ex. 1001 ¶ 120).

Petitioner also identifies at least one motivation to combine the teachings as asserted. Pet. 74. In particular, Petitioner asserts that “the claimed invention is only the use of the ADGPD with the already-established prior art bus-mastering capability” and “[t]he disclosure of Adaptec is directed specifically to SCSI communications” making the combination of Adaptec with the other recited references obvious to a person of skill in the art. *Id.*

Dr. Reynolds testifies that “host adaptors typically support data transfers between the SCSI bus and the host’s system bus” and a person of ordinary skill would have found combining such bus mastering with Aytac’s disclosed SCSI system to be “simply the combination of known devices operating in the same manner without producing any unexpected results.” Ex. 1001 ¶ 120.

Patent Owner does not explicitly address the bus mastering limitation, but relies on its arguments regarding the other independent claims relating to file and digitized analog data transfer limitations. PO Resp. 61–62.

Patent Owner also argues that Petitioner fails to show that “Aytac necessarily discloses a single A/D converter that acquires analog data from each of a plurality of independent analog acquisition channels.” PO Resp. 62. We agree that given our claim construction of this limitation and for the reasons discussed regarding the analog to digital converter limitation of claim 41, Petitioner has not shown that Aytac teaches or suggests the analog to digital converter limitation of claim 39.

Accordingly, we conclude that Petitioner has not shown by a preponderance of the evidence that claim 39 would have been obvious in view of Aytac in combination with the SCSI Specification, the Admitted Prior Art, and Adaptec.

3. Claims 2, 3, 17, and 44

Petitioner relies primarily on its analysis of claim 1 to show unpatentability of claims 2, 3, and 17, which ultimately depend from claim 1 and claim 44, which depends from claim 43. Pet. 71–74. Petitioner, however, relies on Adaptec to show the bus mastering limitation required by claims 2, 3, 17, and 44. *Id.* In addition, Petitioner relies on Adaptec for disclosure of claim 3’s limitation “wherein the active commands initiate active access to write data directly to a hard drive in the host computer independent of the host computer central processor.” *Id.* at 72–73.

Patent Owner does not explicitly address claims 2, 3, 17, and 44, but relies on its arguments regarding the independent claims from which these

claims depend. PO Resp. 63–64. We have addressed those arguments in our analysis above, and determine those arguments are likewise unavailing here.

We also have considered Petitioner’s explanation and supporting evidence as to these claims. Based on the evidence before us, we determine Petitioner has shown, by a preponderance of the evidence, that Aytac, in combination with the SCSI Specification, the Admitted Prior Art, and Adaptec renders these claims obvious. Pet. 69–74; Ex. 1001 ¶¶ 118–135. Therefore, we determine that Petitioner has established by a preponderance of the evidence that Aytac, in combination with the SCSI Specification, the Admitted Prior Art, and Adaptec teaches or suggests claims 2, 3, 17, and 44.

4. Claim 40

Claim 40 depends from claim 39. Above, we explain that we are not persuaded that Petitioner has shown, by a preponderance of the evidence that claim 39 would have been obvious over Aytac, in combination with the SCSI Specification and Admitted Prior Art. For the same reasons, we conclude that Petitioner has not shown that claim 40 would have been obvious over Aytac, in combination with the SCSI Specification, the Admitted Prior Art, and Adaptec.

5. Claim 42

Claim 42 depends from claim 41. Above, we explain that we are not persuaded that Petitioner has shown, by a preponderance of the evidence that claim 41 would have been obvious over Aytac, in combination with the SCSI Specification and Admitted Prior Art. For the same reasons, we conclude that Petitioner has not shown that claim 42 would have been

obvious over Aytac, in combination with the SCSI Specification, the Admitted Prior Art, and Adaptec.

E. Obviousness Assertions Further Including TI Data Sheet

Petitioner asserts that claims 13 and 45 are unpatentable under 35 U.S.C. § 103(a) as obvious over Aytac in combination with the SCSI Specification, Admitted Prior Art, and TI Data Sheet. Pet. 76–77. For claim 38, Petitioner adds TI Data Sheet to the combination. *Id.* at 78–80. For claim 40, Petitioner adds Adaptec to the combination of Aytac, the SCSI Specification, Admitted Prior Art, Adaptec, and the TI Data Sheet. *Id.* at 77–78.

1. Overview of TI Data Sheet

The TI Data Sheet is titled “TLC545C, TLC545I, TLC546C, TLC546I 8-bit Analog-to-Digital Converters with Serial Control and 19 Input.” Ex. 1007. The first page states “SLAS066B—December 1985—Revised October 1996” in the upper left and has a copyright date of 1996 in the lower right. *Id.* It discusses and diagrams the specifications of the chips named in the title. *Id.*

Patent Owner contends that Petitioner fails to show that TI Data Sheet qualifies as a printed publication. PO Resp. 17–19. Patent Owner contends that there is insufficient evidence of TI Data Sheet’s public accessibility as of October 1996, the date on the first page of the document. *Id.* Patent Owner recognizes that Dr. Reynolds, addresses this issue in his declaration, but challenges the sufficiency of that showing. *Id.* at 18.

We have considered this argument in light of Dr. Reynolds' testimony and are persuaded that the TI Data Sheet qualifies as a printed publication that is prior art to the '437 patent. Dr. Reynolds testifies as to the availability of TI Data Sheet in general. Ex. 1001 ¶ 48. Specifically, Dr. Reynolds states that at the relevant time, "TI data sheets would have been described, and their related parts advertised, in hobbyist magazines" and would have been available "by phone and by U.S. Mail and were appearing on the Web." *Id.* We credit this testimony by Dr. Reynolds. And Patent Owner does not proffer evidence to the contrary. PO Resp. 17–19.

Further, the first sheet of the TI Data Sheet includes a warning that "PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty." In addition, as Patent Owner acknowledges, the TI Data Sheet includes an original and revision date on the first page as well as a copyright date. It also includes a part number and the TI trademark. Moreover, the October 1996 date is over a year before the '437 patent's effective date of March 3, 1998.

Therefore, we conclude that the TI Data Sheet qualifies as a printed publication that is prior art to the '437 patent.

2. Overview of TI Patent

The TI Patent discloses an "operational amplifier with digitally programmable gain circuitry on the same chip." Ex. 1013, Title.

3. *Claims 13 and 45*

We determine, above, that Petitioner has established obviousness of claims 13 and 45 based on prior art combinations without the TI Data Sheet by a preponderance of the evidence. Petitioner adds the TI Data Sheet to these combinations as a separate ground based on the TI Data Sheet's disclosure that sample/hold circuitry combined with A/D converters were well-known before the alleged invention. Pet. 53 (citing Ex. 1001 ¶¶ 154–155), 71. Petitioner adds that “[i]ncorporating such well-known circuitry to perform their expected functions would have been well within the capabilities of a [person of ordinary skill] at the time, and it would have been uncommon not to do so.” *Id.*

Patent Owner does not explicitly address claims 13 and 45, but relies on its arguments regarding the independent claims from which these claims depend. PO Resp. 63–64.

We determine that Petitioner has established by a preponderance of the evidence that Aytac, in combination with the SCSI Specification, the Admitted Prior Art, and TI Data Sheet teaches or suggests claims 13 and 45.

6. *Claim 38*

Claim 38 depends from claim 1 and recites “an input connector having at least one BNC input coupled to the processor through a respective independently programmable amplifier, a multiplexer, and an analog to digital converter.” Petitioner relies on the TI Data Sheet as disclosing chips that include “independent, programmable control of a multiplexer and the A/D conversion timing.” Pet. 78 (citing Ex. 1007, 10; Ex. 1001 ¶ 197). Petitioner relies on the TI Patent as disclosing “[a] single chip operational

amplifier programmable by means of a digitally controlled feedback loop . . . under the control of a microprocessor, microcontroller, control logic and the like.” *Id.* at 79 (citing Ex. 1013, Abs.; Ex. 1001 ¶ 198). And Petitioner adds that it would have been obvious to a person of ordinary skill “to use a BNC connector, insofar as the selection of connectors by a designer was well within the knowledge of a [person of ordinary skill].” *Id.* (citing Ex. 1001 ¶ 199).

Petitioner also explains that a person of ordinary skill would have looked to the teachings of the TI Data Sheet and the “closely-related ‘single chip operational amplifier’” of the TI Patent because “the use of commodity items, such as the Texas Instruments IC’s, would have been obvious in the Aytac system.” *Id.* (citing Ex. 1001 ¶ 198).

Patent Owner does not explicitly address claim 38, but relies on its arguments regarding claim 1. PO Resp. 63–64.

We determine that Petitioner has established by a preponderance of the evidence that Aytac, in combination with the SCSI Specification, the Admitted Prior Art, the TI Data Sheet, and the TI Patent teaches or suggests claim 38.

7. Claim 40

Petitioner does not add anything to its analysis of the analog to digital converter limitation of claim 40 for this ground. Specifically, Petitioner adds only that “the ‘sample and hold amplifier’ limitation is disclosed by the TI data sheet.” Pet. 77. Thus, for the reasons discussed above, we conclude that Petitioner has not shown that claim 40 would have been obvious over

Aytac, in combination with the SCSI Specification, the Admitted Prior Art, Adaptec, and the TI Data Sheet.

F. Obviousness Assertions Further Including Muramatsu

Petitioner asserts that claim 32 is unpatentable under 35 U.S.C. § 103(a) as obvious over Aytac in combination with the SCSI Specification, Admitted Prior Art, and Muramatsu. Pet. 75–76. Claim 32 depends from claim 1, and further recites “wherein the digitized analog data is processed by the processor performing a *fast Fourier transform*.” Ex. 1003, 14:60–62 (emphasis added).

Petitioner explains that Muramatsu discloses a camera photometric device that implements a *fast Fourier transform* during the analog data generation process. Pet. 75–76 (citing Ex. 1008, 3:50–57 (“The photometric computation device 8 is configured to include a spectral analysis unit 81 which implements a discrete two-dimensional Fourier transform operation.”)). Dr. Reynolds testifies that using fast Fourier transform was widespread at the time of the invention. Ex. 1001 ¶ 190. 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. 1008, 3:52–57.

Dr. Reynolds also testifies that it would have been obvious for an ordinarily skilled artisan to add a 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. 1001 ¶ 191.

Patent Owner does not explicitly address claim 38, but relies on its arguments regarding claim 1. PO Resp. 63–64.

We determine that Petitioner has articulated a sufficient rationale to combine the teaching of Muramatsu with Aytac, as modified in view of the SCSI Specification and Admitted Prior Art. *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”).

We determine that Petitioner has established by a preponderance of the evidence that Aytac, in combination with the SCSI Specification, the Admitted Prior Art, and Muramatsu renders obvious claim 32.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–38 and 43–45 of the '437 patent are unpatentable under § 103(a) as obvious over the asserted references. Petitioner, however, has not shown by a preponderance of the evidence that claims 39–42 are unpatentable.

IV. ORDER

Accordingly, it is
ORDERED that claims 1–38 and 43–45 of the '437 patent are held
unpatentable;

FURTHER ORDERED that claims 39–42 have not been shown to be
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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