

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOLAREEDGE TECHNOLOGIES LTD.,
Petitioner,

v.

SMA SOLAR TECHNOLOGY AG,
Patent Owner.

IPR2020-00021
Patent 8,922,048 B2

Before JONI Y. CHANG, KRISTEN L. DROESCH, and
SCOTT B. HOWARD, *Administrative Patent Judges*.

HOWARD, *Administrative Patent Judge*.

DECISION
Granting Petitioner's Request on Rehearing
of Final Written Decision
37 C.F.R. § 42.71(d)

INTRODUCTION

A. Background and Summary

SolarEdge Technologies Ltd (“Petitioner”) filed a Petition seeking to institute an *inter partes* review of claims 1–10 of U.S. Patent No. 8,922,048 B2 (Ex. 1001, “the ’048 patent”). Paper 2 (“Petition” or “Pet.”). SMA Solar Technology AG (“Patent Owner”) filed a Patent Owner Preliminary Response. Paper 7. We instituted an *inter partes* review of claims 1–10 of the ’048 patent on all grounds of unpatentability alleged in the Petition. Paper 8 (“Institution Decision” or “Inst. Dec.”).

After institution of trial, Patent Owner filed a Response (Paper 12, “PO Resp.”), Petitioner filed a Reply (Paper 15, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 16, “PO Sur-reply”).

An oral hearing was held on January 11, 2021, and the record contains a transcript of the hearing. Paper 22 (“Tr.”).

We issued a Final Written Decision. Paper 23 (“Final Written Decision” or “FWD”). Applying the August 18, 2020, USPTO Memorandum addressing Treatment of Statements of the Applicant in the Challenged Patent in *Inter Partes* Reviews under § 311 (“Guidance Memo”),¹ we determined that because Petitioner relied on applicant admitted prior art (“AAPA”) as the basis for the *inter partes* review in its Petition and AAPA is not a prior art patent or printed publication, it was not proper to consider AAPA in an *inter partes* review. FWD 18–27. Because Petitioner did not rely on patents and printed publications to teach all of the limitations of any of the challenged claims, we determined that “Petitioner

¹ Available at https://www.uspto.gov/sites/default/files/documents/signed_aapa_guidance_memo.pdf.

has not shown by a preponderance of the evidence that claims 1–10 are unpatentable.” *Id.* at 27–28 (footnote omitted).

Petitioner filed a timely request for rehearing (Paper 24, “Request” or “Req. Reh’g”) along with a request for Precedential Opinions Panel (“POP”) review (Paper 25). The Office also received two amicus forms supporting POP review. Paper 26; Exs. 3002, 3003. POP denied the request in view of the June 9, 2022 USPTO Memorandum Updated Guidance on the Treatment of Statements of the Applicant in the Challenged Patent in *Inter Partes* Reviews Under § 311 (“Updated Guidance”).² Paper 27. POP left “it to the discretion of the original panel to determine whether they would benefit from additional briefing on how the Updated Guidance applies to the issues in this proceeding.” *Id.* at 2 n.2.

With our authorization (Paper 28), Patent Owner filed an Opposition to Petitioner’s Request for Rehearing. Paper 29 (“Rehearing Opposition” or “Opp. Reh’g”). Also with our authorization (Ex. 3004), Petitioner filed a Reply in Support of its Request for Rehearing. Paper 30 (“Rehearing Reply” or “Reply Reh’g”).

We have considered the arguments set forth in the Request for Rehearing, Rehearing Opposition, and Rehearing Reply. Petitioner has persuaded us that, in light of the Updated Guidance, we erred in excluding from consideration the Petitioner’s use of AAPA. Accordingly, for the reasons stated below, we grant the Request for Rehearing and determine that Petitioner has shown by a preponderance of the evidence that the challenged claims are unpatentable.

² Available at <https://www.uspto.gov/sites/default/files/documents/2022060912updatedAAPAmemo.pdf>.

B. The '048 Patent

The '048 patent issued on December 30, 2014, from a PCT application filed on February 11, 2009. Ex. 1001, codes (45), (22).

The '048 patent is titled “PV [Photo Voltaic] Sub-generator Junction Box, PV Generator Junction Box, and PV Inverter for a PV System, and PV System.” *Id.*, code (54).

Figure 1 of the '048 patent is reproduced below.

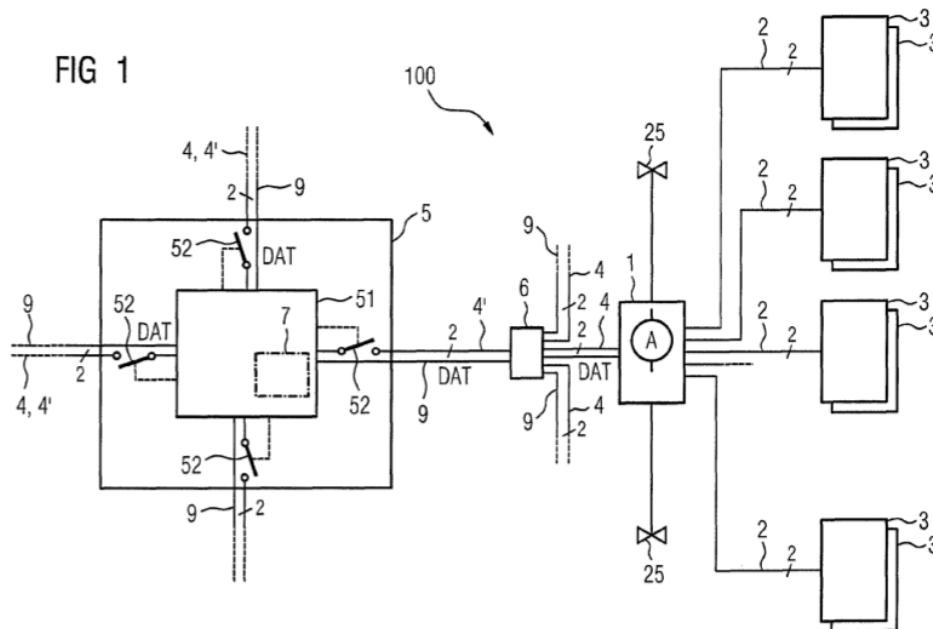


Figure 1 “is an illustration of [a] PV system, in accordance with the prior art” which includes various PV modules 3, PV sub-generator 1, PV generator 6, and PV inverter 5. Ex. 1001, 6:58–59, 7:7–51. Figure 1 shows PV sub-generator lines and PV main DC power lines 4'. *Id.* at 7:9–11. “The mark across the PV sub-generator lines 4 or the PV main DC power lines 4' identified by numeral 2 indicates that the line is preferably a two-wire line.” *Id.* at 7:11–14. The system is configured to disconnect “PV sub-generator lines 4 or PV main DC power lines 4' . . . by a controllable circuit breaker device 52 from a power section 51 of the PV inverter 5.” *Id.* at 7:14–17.

Additionally, “[i]n parallel to each of four PV sub-generator lines 4 or PV main DC power lines 4’ in each case is a communication line 9 for bidirectional transmission of data DAT between the central PV inverter 5 and the respective PV sub-generator junction box 1 shown in the right-hand part of FIG. 1.” *Id.* at 7:17–22.

The ’048 patent describes an improvement in which the data lines are removed and data communication is undertaken by “PV sub-generator line 4 or PV main DC power line 4.” Ex. 1001, 8:53–59. Furthermore, “[t]o guarantee bidirectional data transmission, a data signal coupler 56 is connected between each of the possible separation points.” *Id.* at 8:59–64. Figure 3 of the ’048 patent is reproduced below.

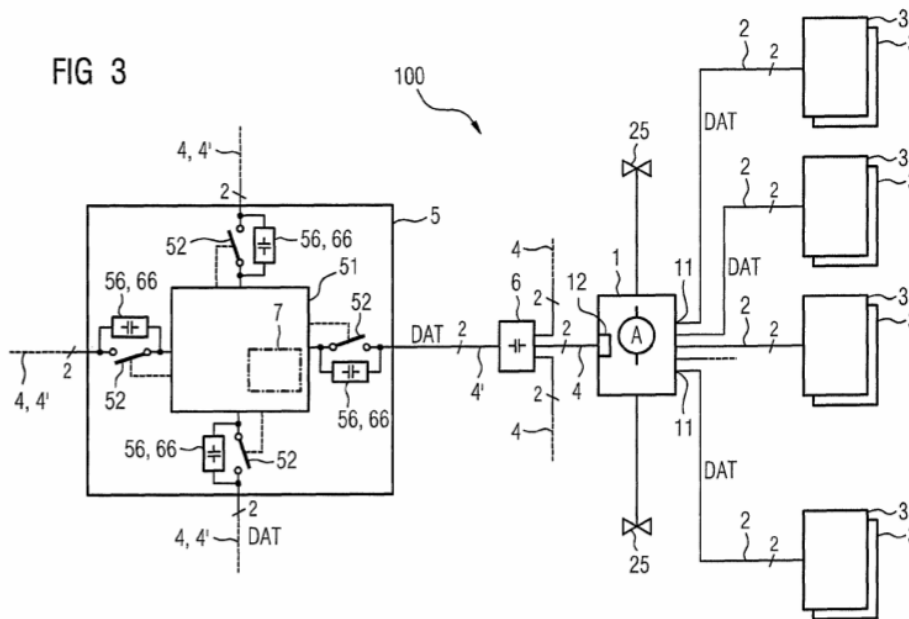


Figure 3 “is an illustration of an exemplary PV system in accordance with the invention” disclosed in the ’048 patent. *Id.* at 6:62–63. As shown in Figure 3, the data lines have been removed and only a single line—a DC power line—connects inverter 5 with PV generator box 6 and a single line—

a DC power line—connects PV generator box 6 with each PV sub-generator box 1. *Id.*, Fig. 3.

Figure 6 of the '048 patent is reproduced below.

FIG 6

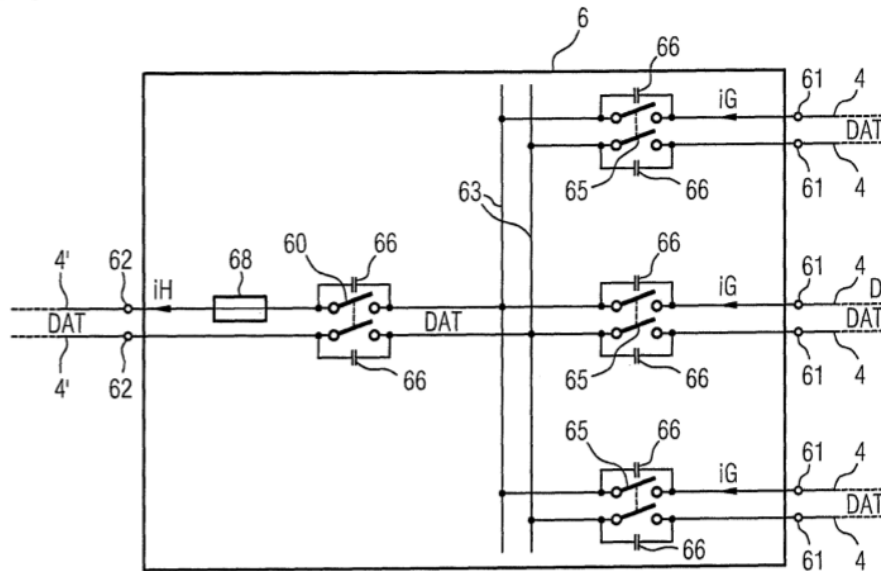


Figure 6 “is an illustration of an exemplary generator junction box in accordance with the invention” disclosed in the '048 patent. Ex. 1001, 7:1–2. Figure 6 shows

data signal coupler 66 . . . connected in parallel to the respective circuit breakers 60, 65 so that data DAT which is fed into the respective PV sub-generator lines 4 and into the PV main DC power line 4' is also able to be forwarded in the opened state of the respective circuit breaker 60, 65.

Id. at 10:28–33.

C. Illustrative Claims

Petitioner challenges claims 1–10 of the '048 patent. Pet. 1. Claims 1, 4, 5, and 7 are independent. *See* Ex. 1001, 10:58–12:60. Claims 1 and 4 are illustrative of the subject matter of the challenged claims and read as follows:

1. A photovoltaic (PV) sub-generator junction box for a PV system, comprising:

a plurality of electrical terminals for connection to respective PV string lines of at least one series-connected PV module; and

a sub-generator line terminal for connection to a remote central PV inverter;

an electronic control unit connected for data communication to a central control unit within the remote central PV inverter for exchange of data;

wherein the PV sub-generator line is configured to deliver power received from respective PV string lines to the remote central PV inverter; and

a power line modem configured to transmit and receive the data over the PV sub-generator line that delivers power;

wherein the electronic control unit includes at least one electrical output for activating at least one switching device of the PV sub-generator junction box, and wherein the data receivable from the central control unit within the PV inverter by the power line modem comprises corresponding control data.

4. A photovoltaic (PV) generator junction box for a PV system, comprising:

a plurality of sub-generator line terminals for connection to respective PV sub-generator lines of PV sub-generator junction boxes;

a main DC power line terminal for connecting a PV main DC power line of a remote central PV inverter;

at least one of a main circuit breaker for disconnecting the PV main power line and a collective circuit breaker for disconnecting a respective one of the PV sub-generator lines; and a data signal coupler connected in parallel to a respective circuit breaker of the at least one of the main circuit breaker and the collective circuit breaker, so that data to be transferred between the respective PV sub-generator line and the PV main DC power

line is also able to be forwarded through the data signal coupler when the respective circuit breaker is in an open state.

Id. at 10:58–11:11, 11:27–44.

D. Asserted Prior Art and Grounds

Petitioner asserts that claims 1–10 would have been unpatentable on the following grounds:³

Claims Challenged	35 U.S.C. §⁴	References/Basis
1–10	103(a)	AAPA, ⁵ Rodgers ⁶
1–3, 5, 7	103(a)	AAPA, Frezzolini ⁷
4, 6, 8–10	103(a)	AAPA, Frezzolini, Iwamura ⁸
4, 10	103(a)	AAPA, Richter, ⁹ Rodgers

³ Petitioner identifies three grounds, two of which have alternative combinations: (1) AAPA and Rodgers or Frezzolini and (2) AAPA and Rodgers or Frezzolini-Iwamura. Pet. 19. Each alternative combination has been listed separately. Petitioner also lists AAPA and Rodgers as two separate grounds directed to different claims. *Id.* Those grounds have been combined.

⁴ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Because the ’048 patent issued from an application filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability.

⁵ Petitioner identifies Figures 1 and 2 and the text at column 2, line 54 through column 3, line 62; column 6, lines 58 through 61; and column 7, line 7 through column 8, line 50 of the ’048 patent as applicant admitted prior art (“AAPA”). Pet. 9.

⁶ US 2007/0008076 A1, published Jan. 11, 2007 (Ex. 1003).

⁷ US 2007/0019613 A1, published Jan. 25, 2007 (Ex. 1005).

⁸ US 2007/0213879 A1, published Sept. 13, 2007 (Ex. 1006).

⁹ WO 2007/048421 A2, published May 3, 2007 (Ex. 1004).

Additionally, Petitioner relies on the Declarations of Jonathan R. Wood, Ph.D. (Ex. 1011; Ex. 1020) and Patent Owner relies on the Declarations of Thomas Blackburn (Ex. 2001; Ex. 2005).

ANALYSIS

A. Legal Standard for Assessing Obviousness

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under 35 U.S.C. § 103 that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the U.S. Court of Appeals for the Federal Circuit has repeatedly emphasized that “it is error to reach a conclusion of obviousness until all those factors are considered,” *WBIP, LLC v. Kohler*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). We note that, with respect to the fourth *Graham* factor, the parties have not presented argument or evidence directed to secondary considerations of nonobviousness. *See* Pet.; PO Resp.

B. Level of Ordinary Skill in the Art

Factors pertinent to a determination of the level of ordinary skill in the art include (1) the educational level of the inventor; (2) the types of problems encountered in the art; (3) prior art solutions to those problems; (4) the rapidity with which innovations are made; (5) the sophistication of the technology; and (6) the educational level of workers active in the field. *Env’tl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696–97 (Fed.

Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). “Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case.” *Id.* Moreover, these factors are not exhaustive, but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co., Ltd., Inc. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

Petitioner argues—supported by the testimony of Dr. Wood—that a person having ordinary skill in the art (“PHOSITA”) “would have had a bachelor’s degree in mechanical engineering, electrical engineering, or a similar discipline and *at least* two years of design experience with photovoltaic systems.” Pet. 20 (emphasis added) (citing Ex. 1011 ¶¶ 18–22).

In the Institution Decision, we adopted Petitioner’s description of a person having ordinary skill in the art, “except that we delete[d] the qualifier ‘at least’ to eliminate vagueness as to the amount of practical experience.” Inst. Dec. 15–16.

Patent Owner does not address that determination. *See* PO Resp. Accordingly, for the reasons given in the Institution Decision, we adopt Petitioner’s proposed level of ordinary skill, except that we delete the qualifier “at least” to eliminate vagueness as to the amount of practical experience. *See* Inst. Dec. 16. Therefore, a person having ordinary skill in the art would have had a bachelor’s degree in mechanical engineering, electrical engineering, or a similar discipline and two years of design experience with photovoltaic systems.

C. Claim Construction

We apply the same claim construction standard used in the federal courts, in other words, the claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2019). Under the *Phillips* standard, the “words of a claim are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1312–13 (quotation marks and citations omitted).

Petitioner argues that all claim terms should be construed according to their ordinary and customary meaning at the time of the invention. Pet. 20. Patent Owner argues that two terms require explicit constructions: “the power line modem” and “the data signal coupler.” PO Resp. 20–22.

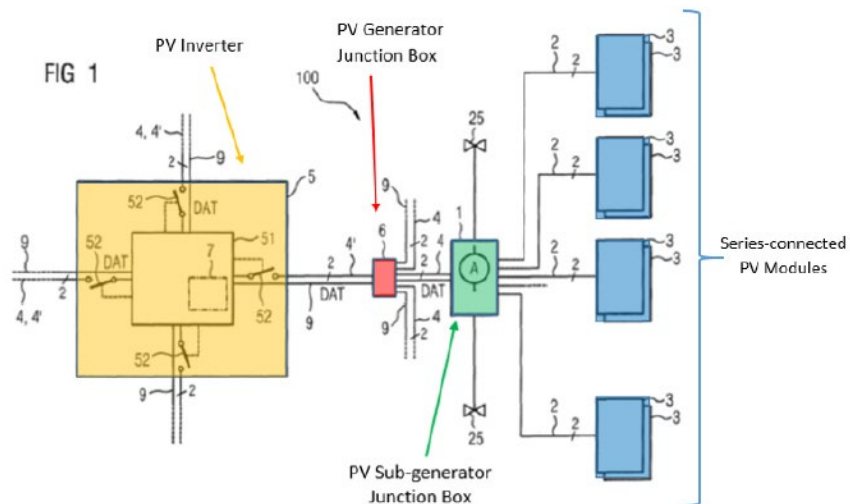
Patent Owner’s proposed claim constructions limit the “power line modem” and the “data signal coupler” to DC power lines. PO Resp. 20–22. However, during the Oral Hearing, Patent Owner agreed that, consistent with the plain and ordinary meaning, the other limitations of the claims require that the components operate on DC power lines. Tr. 37:5–23. As discussed in more detail below, Petitioner’s combination of prior art references uses DC power lines. Accordingly, no express construction is needed to resolve any dispute in this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 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))).

D. Summary of the Prior Art

1. AAPA

The '048 patent identifies a prior art PV system including inverter 5, generator junction box 6, sub-generator junction boxes 1, and connected PV modules 3. *See* Ex. 1001, 2:64–3:52, 7:7–8:50, Fig. 1. AAPA includes DC power lines—main DC power line 4' and sub-generator line 4—for transferring power and a separate data communication line 9 for exchanging data. *Id.* at 7:7–67, Fig. 1.

Petitioner annotated a version of Figure 1 of the '048 patent, which is reproduced below.



Pet. 21. Figure 1 “is an illustration of [a] PV system, in accordance with the prior art” and has been annotated by Petitioner to identify the PV inverter (yellow), the PV Generator Junction Box (red), the PV Sub-generator Junction Box (green), and Series-connected PV Modules (blue). *Id.*; Ex. 1001, 6:58–59.

2. Rodgers

Rodgers teaches a residential power distribution system 100, which includes a power management system 300. Ex. 1003 ¶ 23. A webserver

communicates messages throughout the residential power distribution system by “send[ing] and receiv[ing] power line communications (PLC) messages via a conventionally known PLC modem.” *Id.* ¶ 24; *see also id.* ¶ 59 (“The dynamic load management system 300 further includes . . . a PLC modem 304.”).

According to Rodgers, “[o]ne of the problems with PLC messaging is that when current state-of-the-art circuit breakers are in the open position the communication link is broken.” Ex. 1003 ¶ 34. In order to “overcome this problem,” Rodgers teaches that “the PLC module (communications interface 224) spans the gap to provide a communication path between the line side of the circuit and the load side by means of power line couplers 250a-d.” *Id.*

3. *Frezzolini*

Frezzolini teaches “a system wherein the transmission of data takes place via power line carrier transmission along the power supply line of the various electrical devices to which the control devices are associated.” Ex. 1005 ¶ 2. More specifically, the “transmission occurs via power line carrier transmission on the power supply line by means of modems specifically produced for this function and known as PLM (Power Line Modem).” *Id.* ¶ 16; *see also id.* ¶ 45.

4. *Iwamura*

Iwamura “provide[s] systems and methods for implementing and controlling local power line communication (PLC) networks.” Ex. 1006, code (57). Iwamura teaches using circuit breakers between central controller 130 and other elements of the PLC network. *Id.* ¶ 47. Iwamura further teaches that “circuit breakers include a switch that opens when a current exceeding a threshold is drawn through the circuit breaker” and that “[t]his

opening of the switch in a typical breaker also breaks PLC connections between devices of a local PLC network.” *Id.*

In order to allow communication when the switch is open, Iwamura teaches using PLC signal coupler 742 to bridge circuit breaker switch even when the switch is open. Ex. 1006 ¶ 58. Iwamura further teaches that “the breaker PLC signal coupler 742 can include a transducer and may be an inductive coupler such as toroid coupling transformer, a capacitive coupler or other relevant coupler or combination of couplers, for coupling PLC data through the PLC circuit breaker 720.” *Id.* ¶ 59.

5. *Richter*

Richter “relates to an electrical circuit arrangement for controlling the output of at least one string of a solar generator.” Ex. 1004, code (57). Richter teaches that various arrangements of solar modules and connecting housings may be used to carry out the invention and for controlling—via switches—the output of one or more connecting lines. *Id.* at 22:25–24:11, Figs. 2–9.

E. Whether the Petition’s Use of AAPA Is Consistent with 35 U.S.C. § 311(b)

1. *The Updated Guidance*

The Director has issued guidance discussing how the PTAB will treat a petitioner’s reliance on statements made in the specification of a challenged patent. *See* Guidance Memo; Updated Guidance.¹⁰ Because the

¹⁰ The Director issued the Guidance Memo after the Institution Decision. Petitioner addressed the Guidance Memo in its Reply and Patent Owner addressed it in its Sur-reply. *See* Pet. Reply 24; PO Sur-reply 3–11. Additionally, both parties addressed the Updated Guidance in rehearing briefing. *See* Opp. Reh’g; Reply Reh’g.

Updated Guidance superseded the Guidance Memo (Updated Guidance 1), we base our determination on the Updated Guidance. *See MED-EL Elektromedizinische Geräte Ges.m.b.H., v. Advanced Bionics AG*, IPR2020-01019, Paper 44 (PTAB Aug. 22, 2022) (Director Review Decision) (holding that the Updated Guidance applies to all pending requests for rehearing when the original Final Written Decision was based on the Guidance Memo).

Section 311(b) of Title 35 of the U.S. Code limits the prior art that may be used as the “basis” of an *inter partes* review to “patents or printed publications.” 35 U.S.C. § 311(b); *accord* Updated Guidance 2. “[B]ecause admissions are not prior art, and therefore cannot form the basis of an IPR, it is ‘impermissible for a petition to challenge a patent relying on solely AAPA without also relying on a prior art patent or printed publication.’” Updated Guidance 2 (quoting *Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1377 (Fed. Cir. 2022)). However, “[i]f an IPR petition relies on admissions in combination with reliance on one or more prior art patents or printed publications, those admissions do not form ‘the basis’ of the ground and *must be considered by the Board in its patentability analysis.*” *Id.* at 4 (emphasis added).

The Updated Guidance further provides guidance on how to determine if the challenged patent contains an admission:

Admissions may include statements in the specification of the challenged patent such as “It is well known that . . . ,” “It is well understood that . . . ,” or “One of skill in the art would readily understand that . . . ,” or may describe [the] technology as “prior art,” “conventional,” or “well-known.”

Updated Guidance 4 (citing *McCoy v. Heal Sys., LLC*, 850 F. App’x 785, 789 (Fed. Cir. 2021) (non-precedential)). The Updated Guidance further

provides that a patent owner may dispute whether the statement constitutes an admission: “Of course, parties may dispute the significance or meaning of statements in the specification or other evidence, including disputing whether specification statements constitute admissions or evidence of the background knowledge possessed by a person of ordinary skill in the art.” *Id.* at 4–5.¹¹

2. *Petitioner’s Arguments*

Petitioner argues that the patent applicant made admissions in the specification “regarding the scope of the prior art that can be relied upon for obviousness determinations during *inter partes* review.” Pet. 9. With respect to the Updated Guidance, Petitioner argues that “an admission does not form ‘the basis’ of an IPR if it is combined with a prior art patent document.” Reply Reh’g 2 (citing Updated Guidance 4). According to Petitioner, because AAPA is combined with prior art patents, AAPA “does not form ‘the basis’ of this IPR.” *Id.* Petitioner further argues that Patent Owner’s argument does not apply the standard of the Updated Guidance. *Id.* at 2–3.

Petitioner also argues that we erred in considering Patent Owner’s argument that AAPA was not generally known. Req. Reh’g 6–10; Reply Reh’g 4–5. According to Petitioner, “Patent Owner . . . never contested in its Response or Sur-reply that any element of the AAPA system was not generally known.” Req. Reh’g 8 (citing PO Resp. 5–6, 55–62; PO Sur-reply 3–11; Tr. 7:21–8:1). Instead, Petitioner argues “Patent Owner waited until the hearing to re-characterize its admissions that the AAPA system was

¹¹ Notably, the same language appears in the Guidance Memo. *See* Guidance Memo 6–7.

‘known’ as merely ‘known’ to the applicant.” *Id.* (citing FWD 27; Tr. 34:11–24); *see also* Reply Reh’g 4. Petitioner further argues that this violated our rule prohibiting the introduction of new evidence during the oral argument and “impinges upon Petitioner’s due process right.” Req. Reh’g 8–9 (citing CTPG¹² 85–86; *Dell Inc. v. Accelaron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016)); *see also* Reply Reh’g 4. Petitioner further argues that, even if we consider this argument, Patent Owner’s “assertions are unfounded in light of the Updated Guidance and record evidence.” Reply Reh’g 4; *see also id.* at 4–5 (arguing same).

Petitioner also argues that the Director’s guidance on applicant admitted prior art is improper rulemaking. Req. Reh’g 13–15.¹³

3. Patent Owner’s Arguments

Patent Owner argues 35 U.S.C. § 311(b) limits *inter partes* review such that “(1) only grounds under Section 102 or Section 103 can be raised, and such 102/103 grounds can be raised based only on (2a) prior art patents, or (2b) prior art printed publications.” PO Resp. 56. Patent Owner further argues that its “statutory interpretation is supported by the promulgated rule to implement the statutory provision,” namely, “37 C.F.R. § 42.104(b)(4) states that an IPR petition ‘must specify where each element of the claim is found in the prior art patents or printed publications relied upon.’” *Id.*

¹² Patent Trial and Appeal Board Consolidated Trial Practice Guide (November 2019), *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

¹³ Petitioner also advanced several arguments based on the Panel misunderstanding the Guidance Memo and an alleged inconsistency between the Institution Decision and the Final Written Decision. Req. Reh’g. 4–13. Those arguments are moot in light of the Updated Guidance, which superseded the Guidance Memo, and this Decision.

According to Patent Owner, “[w]ith a clear, unambiguous statutory text, such as in the present case with Section 311(b), . . . the proper judicial role ‘is to apply, not amend, the work of the People[’]s representatives.’” *Id.* at 57 (quoting *Henson v. Santander Consumer USA*, 137 S. Ct. 1718, 1726 (2017)).

Patent Owner also argues that neither of the two PTAB decisions cited by Petitioner “explains how the statutory text of Section 311(b) is ambiguous and thus warrants extra-textual interpretation to expand the textual language to include admissions as a basis for institution.” PO Resp. 58. Patent Owner further argues that those cases “contradict a holding by another, earlier PTAB panel that holds under Section 311(b) that AAPA description in the patent under review does not qualify as prior art on which an *inter partes* review may be instituted.” *Id.* (citing *Fresenius Kabi USA, LLC v. Cephalon, Inc.*, IPR2016-00098, Paper 10 at 17 (PTAB May 4, 2016) (Institution Decision)). Patent Owner further argues that using AAPA is inconsistent with statements by Administrative Patent Judges in a PTO blog. *Id.* at 59 (citing Jacqueline Bonilla & Sheridan Sneddan, *AIA Blog Message from Administrative Patent Judges Jacqueline Bonilla and Sheridan Snedden: Routine and Additional Discovery in AIA Trial Proceedings: What Is the Difference?*, USPTO Website (Sept. 30, 2014, 10:01 AM), <https://www.uspto.gov/patent/laws-and-regulations/america-invents-act-aia/aia-blog-message-administrative-patent-judges>).

Patent Owner also argues that Petitioner’s use of AAPA in this proceeding is not proper because it forms the basis of Petitioner’s arguments. *See* PO Sur-reply 4–11. Specifically, Patent Owner argues that the Guidance Memo “does not make a blanket statement that AAPA can be combined with a prior art patent or printed publication.” PO Sur-reply 4.

Instead, Patent Owner argues that statements in the specification of the '048 patent “may not constitute ‘the basis’ of the [*inter partes* review].” *Id.* at 5 (citing Guidance Memo 6 n.4). According to Patent Owner, because “AAPA forms the foundation or starting point for each ground” in the Petition, “Petitioner employs AAPA as the basis of the grounds in the Petition.” *Id.* at 6; *accord id.* at 6–11 (setting forth arguments).

With regard to the Updated Guidance, Patent Owner argues that the Board’s evaluation of the AAPA in the Final Written Decision was consistent with the Updated Guidance. *Opp. Reh’g* 4–8. Specifically, Patent Owner argues that the Final Written Decision “focused properly on the totality of the facts set before it in the original Petition and the oral hearing.” *Id.* at 4. According to Patent Owner, “the Petition constructed Ground A by laying the foundation with AAPA, and then building substantively thereon using a secondary reference (*i.e.*, the prior art patent or publication).” *Id.* at 6. Patent Owner further argues the Board “considered properly the manner in which the Petition substantively formulated its rationale for combining together the AAPA and the listed prior art patents or publications.” *Id.* at 7.

Patent Owner also argues that the use of AAPA in this proceeding is improper because “there is no evidence that the asserted AAPA was known in the prior art.” *Opp. Reh’g* 8. According to Patent Owner, the Board properly recognized in the Final Written Decision that “the Patent Owner’s expert had testified that the AAPA appeared to be known *to the applicant*, but no evidence existed in his review of the prior art of record that a system as shown in Fig. 1 was known to be *in the prior art.*” *Id.* at 8–9 (citing FWD 27) (emphasis in original). Patent Owner also argues that “there is no evidence that the asserted AAPA was generally known in the prior art or was

within the knowledge of an ordinarily-skilled artisan at the time of the invention.” *Id.* at 9. Therefore, Patent Owner argues, “the Board panel’s Decision that the use of AAPA was improper is not an abuse of discretion, and Petitioner’s request for a rehearing should be denied.” *Id.*

a) *Our Analysis*

(1) *Does the Director Have the Authority to Issue Guidance Memoranda*

We disagree with Petitioner¹⁴ that the Guidance Memo and the Updated Guidance¹⁵ are substantive rulemaking which violates the Administrative Procedure Act. Congress expressly authorized the Director to “provid[e] policy and management supervision for the Office.” 35 U.S.C. § 3(a)(2)(A), cited by Updated Guidance at 2. This statutory authority allows the Director to “issue policy directives and management supervision of the Office” including “instructions that include exemplary applications of patent laws to fact patterns, which the Board can refer to when presented with factually similar cases.” *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320, 1331 (Fed. Cir. 2019), *rev’d on other grounds, United States v. Arthrex*, 141 S.Ct. 1970 (2021). The Guidance Memo and Updated Guidance fall within the scope of the Director’s authority.

(2) *Does AAPA Form the Basis of the Grounds*

By statute, *inter partes* review proceedings can only be requested “on a ground that could be raised under section 102 or 103 and *only on the basis* of prior art consisting of patents or printed publications.” 35 U.S.C.

¹⁴ Patent Owner does not address this argument. *See* Opp. Reh’g. Nor does Patent Owner make a similar argument. *See id.*

¹⁵ Although the Request for Rehearing only discusses the Guidance Memo, we consider both the Guidance Memo and the Updated Guidance.

§ 311(b) (emphasis added); *see also Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1374 (Fed. Cir. 2022). Thus, the first issue before us is whether AAPA improperly formed the “basis” of Petitioner’s challenge. *See Qualcomm*, 24 F.4th at 1376–77 (remanding applicant admitted prior art case for the Board to determine “whether AAPA improperly formed the ‘basis’ of Apple’s challenge”).

The answer to this question is found in the Updated Guidance: “If an IPR petition relies on admissions in combination with reliance on one or more prior art patents or printed publications, those admissions do not form ‘the basis’ of the ground and *must be considered by the Board in its patentability analysis.*” Updated Guidance 4 (emphasis added). Because Petitioner’s grounds involve a combination of AAPA and prior art patent(s), AAPA does not form the basis of the grounds. *See* Pet. 19 (setting forth the grounds). Instead, it is the prior art patents—Rodgers, Frezzolini, Iwamura, and/or Richter—that form the basis of the challenge and AAPA is just being used to provide the missing limitations. *See MED-EL*, Paper 44 at 4 (“As discussed above, the Petition relies on AAPA in combination with either Petersen, Zilberman and/or Saaski. Accordingly, AAPA “do[es] not form ‘the basis’ of the ground and must be considered by the Board in its patentability analysis.” (quoting Updated Guidance 4) (modifications in original)).

This is consistent with Federal Circuit case law discussing the use of admissions in proceedings. Specifically, the Federal Circuit “has held ‘it is appropriate to rely on admissions in a patent’s specification when assessing whether that patent’s claims would have been obvious’ in an *inter partes* review proceeding.” *Qualcomm*, 24 F.4th at 1375 (quoting *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1339 (Fed. Cir. 2020)); *see also*

PharmaStem Therapeutics, Inc. v. ViaCell, Inc., 491 F.3d 1342, 1362 (Fed. Cir. 2007) (“Admissions in the specification regarding the prior art are binding on the patentee for purposes of a later inquiry into obviousness.”); *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1998) (“A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness.”). Indeed, in *Koninklijke Philips* the Federal Circuit “rejected an argument that the general knowledge of a skilled artisan may not be relied on in an *inter partes* review because it does not constitute ‘prior art consisting of patents or printed publications’ under § 311(b).” *Qualcomm*, 24 F.4th at 1376. Thus, AAPA can be used to, *inter alia*, “supply[] a missing claim limitation.” *Id.* (citing *Koninklijke Philips*, 948 F.3d at 1337–38) (alteration in original). Because AAPA is being properly used to supply the missing claim limitation, it does not form the basis of the *inter partes* review. *See id.* (recognizing that “even though evidence such as expert testimony and party admissions are not themselves prior art references, they are permissible evidence in an *inter partes* review for establishing the background knowledge possessed by a person of ordinary skill in the art.”).

In its Opposition, Patent Owner does not address this language in the Updated Guidance. *See Opp. Reh’g* 4–8. Instead, Patent Owner argues that we correctly determined in the Final Written Decision that AAPA was the foundation or starting point of the ground. *Id.* However, the language that we relied upon from the Guidance Memo in the Final Written Decision has been deleted from the Updated Guidance. *Compare* Guidance Memo 6 (directing the PTAB to determine if the applicant admitted prior art is the foundation or starting point), *with* Updated Guidance (language omitted). Although we properly followed the Guidance Memo in the Final Written

Decision, that analysis is foreclosed by the Updated Guidance. Thus, we follow the clear and unambiguous requirements of the Updated Guidance.

Moreover, Patent Owner does not direct us to any Federal Circuit case law that suggests using the foundation or starting point test of the Guidance Memo. *See* Opp. Reh’g 4–8. Although the *Qualcomm* panel was aware of the Guidance Memo (*see* 24 F.4th at 1373), the Federal Circuit neither discussed the test set out in the Guidance Memo, nor directed that the PTAB apply the foundation or starting point test. *See* 24 F.4th 1367.

(3) Whether AAPA Is Known in the Prior Art

In the Final Written Decision, we stated that “[a]lthough AAPA might have been ‘known’ to the applicant, the evidence in the record suggests that systems similar to the AAPA were not ‘well-known.’” FWD 27 (citing Ex. 1019, 50–51; Tr. 34). We further recognized that “the PV systems taught in the art of record do not demonstrate the system shown in AAPA. *See* Ex. 1004; Ex. 1005; Ex. 1015 (article describing a PV Systems).” *Id.* However, we agree with Petitioner that we erred in considering that argument in the Final Written Decision.¹⁶

Both the Guidance Memo and the Updated Guidance contain identical language regarding challenging the meaning or significance of statements in the specification: “Of course, parties may dispute the significance or meaning of statements in the specification or other evidence, including

¹⁶ Despite it being clearly raised in the Request (Req. Reh’g 8–9), Patent Owner does not address the timing of its argument in its Opposition. *See* Opp. Reh’g 8–9. Instead, Patent Owner simply repeats the argument that it raised for the first time at the Oral Hearing: “[T]here is no evidence that the asserted AAPA was generally known in the prior art or was within the knowledge of an ordinarily-skilled artisan at the time of the invention.” *Id.*

disputing whether specification statements constitute admissions or evidence of the background knowledge possessed by a person of ordinary skill in the art.” Guidance Memo 6–7; Updated Guidance 4–5. Although Patent Owner had the opportunity to make such an argument in the Sur-reply when addressing the Guidance Memo (and by implication, the identical language of Updated Guidance), Patent Owner chose not to do so and, accordingly, forfeited the argument. *See* Paper 9, 7. Although Patent Owner raised the argument at the oral hearing,¹⁷ that is not enough to preserve the argument as no new arguments can be made during the Oral Hearing. *See* CTPG at 85–86 (“During an oral hearing, a party . . . may only present arguments relied upon in the papers previously submitted.”); *Dell*, 818 F.3d at 1301 (“[T]he Board denied Acceleron its procedural rights by relying in its decision on a factual assertion introduced into the proceeding only at oral argument, after Acceleron could meaningfully respond.”). Just as a movant may not make a new argument in a request for rehearing, a party opposing such a request cannot raise new arguments that it did not make before. *See Apple Inc. v. Taction Tech., Inc.*, IPR2022-00057, Paper 15 at 4 (“A request for rehearing is not an opportunity . . . to present new arguments.”) (Denying Request for Rehearing).

Accordingly, because Patent Owner did not argue that the limitations taught by the AAPA were not known in the prior art in its Patent Owner Response or Sur-reply, that argument is forfeited and cannot be considered on rehearing.

¹⁷ In the Final Written Decision, we relied on Dr. Blackburn’s testimony. Final Dec. 27. However, Patent Owner did not cite that testimony in the original briefing. *See* PO Resp.; PO Sur-reply. Instead, Patent Owner raised it for the first time during the oral hearing. Tr. 34:11–24.

(4) *Conclusion*

For the reasons discussed above, AAPA is not the basis of this *inter partes* review proceeding. Instead, following the explicit instruction in the Updated Guidance and based on controlling Federal Circuit case law, Petitioner has presented challenges on the “basis of prior art consisting of patents or printed publications,” 35 U.S.C. § 311(b), and this is appropriately considered in combination with AAPA.. Moreover, because Patent Owner did not challenge whether AAPA was generally known in the prior art in the Patent Owner Response or Sur-reply, Patent Owner forfeited its argument and cannot raise it in opposing the Request for Rehearing. Accordingly, AAPA can be used for all appropriate purposes, including to “supply missing claim limitations.” *See* Updated Guidance 4.

F. Ground 1: AAPA and Frezzolini

1. Analysis of Claim 1

a) Undisputed Limitations

The preamble¹⁸ of claim 1 recites “[a] photovoltaic (PV) sub-generator junction box for a PV system.” Ex. 1001, 10:58–59. Petitioner argues AAPA teaches the preamble. Pet. 20–21. Specifically, Petitioner argues that Figure 1 of the ’048 patent show that “AAPA’s PV system includes a sub-generator junction box 1.” Pet. 20 (citing Ex. 1001 3:36–55, 7:7, 7:17–36, 7:52–8:50, Figs. 1–2; Ex. 1011 ¶ 113).

Claim 1 further recites “a plurality of electrical terminals for connection to respective PV string lines of at least one series-connected PV

¹⁸ Neither Petitioner nor Patent Owner addresses whether the preamble is limiting. Because Petitioner has shown that the recitation in the preamble is satisfied by the prior art, there is no need to determine whether the preamble is limiting. *See Nidec*, 868 F.3d at 1017.

module.” Ex. 1001, 10:60–62. Petitioner argues AAPA teaches this limitation. Pet. 21–23. Specifically, Petitioner argues that “AAPA’s system includes ‘PV modules 3 connected in series,’ which form string lines 2” and that “AAPA’s sub-generator junction box 1 includes electrical terminals 11 . . . for connecting the string lines.” Pet. 21–22 (citing Ex. 1001 2:64–3:1, 3:15–16, 3:26–29, 7:48–57, Fig. 1).

Claim 1 further recites “a sub-generator line terminal for connection to a remote central PV inverter.” Ex. 1001, 10:63–64. Petitioner argues AAPA teaches that limitation. Pet. 23–24. Specifically, Petitioner argues “AAPA’s sub-generator junction box ‘has a sub-generator line terminal 12 . . . by which the PV sub-generator junction box 1 can be connected to the central PV inverter 5.’” *Id.* at 23 (citing Ex. 1001, 3:8–15, 3:29–33, 7:57–61, Figs. 1, 2).

Claim 1 further recites “an electronic control unit connected for data communication to a central control unit within the remote central PV inverter for exchange of data.” Ex. 1001, 10:65–67. Petitioner argues AAPA teaches that limitation. Pet. 24–25. Specifically, Petitioner argues “AAPA’s sub-generator junction box ‘features an electronic control unit 10 . . . which has a data connection to the central control unit 7 of the PV inverter 5 for exchanging the data DAT.’” *Id.* at 24 (quoting Ex. 1001, 7:62–65) (citing Ex. 1001, 3:34–43, 8:1–24, Figs. 1, 2).

Claim 1 further recites “wherein the PV sub-generator line is configured to deliver power received from respective PV string lines to the remote central PV inverter.” Ex. 1001, 11:1–3. Petitioner argues AAPA teaches that limitation. Pet. 25. Specifically, Petitioner argues that AAPA’s sub-generator junction boxes receive power generated by PV modules 32 and delivers the power to PV inverter 5. *Id.* (citing Ex. 1001 2:64–3:17,

3:26–33, 7:7–17, 7:27–33, 7:40–61, 8:9–17, 8:29–35, Figs. 1–2; Ex. 1011 ¶¶ 112–113).

Claim 1 further recites “wherein the electronic control unit includes at least one electrical output for activating at least one switching device of the PV sub-generator junction box.” Ex. 1001, 11:6–8. Petitioner argues AAPA teaches that limitation. Pet. 30. Specifically, Petitioner argues “AAPA’s control unit 10 has electrical outputs 28 for activating a switching device of sub-generator junction box 1.” *Id.* (emphasis omitted) (citing Ex. 1001, 3:43–48, 8:17–27, 8:32–44).

Based on the undisputed evidence before us and the reasons set forth in the Petition, including the Wood Declaration, which are not addressed by Patent Owner (*see* PO Resp.), we are persuaded that AAPA teaches a “(PV) sub-generator junction box” including “a plurality of electrical terminals . . . ,” “a sub-generator line terminal . . . ,” “an electronic control unit . . . ,” “the PV sub-generator line . . . configured to deliver power . . . ,” and “the electronic control unit includ[ing] at least one electrical output” as recited in claim 1.

b) *“A Power Line Modem Configured to Transmit and Receive the Data over the PV Sub-Generator Line that Delivers Power”*

(1) Petitioner’s Arguments

Claim 1 also recites “a power line modem configured to transmit and receive the data over the PV sub-generator line that delivers power.”

Ex. 1001, 11:4–5.

Petitioner argues that Frezzolini teaches using a modem to communicate data over power lines. Pet. 26. According to Petitioner, Frezzolini is not limited to using a power line modem over AC power lines.

Pet. Reply 6–11. Petitioner argues that “[Patent Owner] and Mr. Blackburn do not dispute that Frezzolini [teaches that] power line 104 carries DC voltage [and] that Frezzolini expressly discloses that control devices 7₁₋₄ use PLMs to ‘transmit and receive information’ along power line 104.” *Id.* at 6 (citations omitted). Petitioner further argues that the TDA5051 modem, which is identified in Frezzolini,¹⁹ could be used on “‘any’ DC or AC network.” *Id.* (citing Ex. 1021, 3; Ex. 1035 ¶¶ 1–21).

Petitioner also disputes that Frezzolini Figure 9 is “inaccurate.” Pet. Reply 7–9. Petitioner further argues that even if Figure 9 is incorrect schematically and thus inoperable, “Frezzolini is still prior art for all that it teaches, including a PLM that exchanges data over DC power line 104.” *Id.* at 9 (citing Ex. 1005, ¶ 140; Ex. 1020, ¶¶ 39–40; *Geo. M. Martin Co. v. All. Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1302 (Fed. Cir. 2010)).

In response to Patent Owner’s arguments, Petitioner also argues that lines 104 in paragraph 140 refers to power line 104 and not a sheathed cable. Pet. Reply 10. According to Petitioner, the use of a sheathed cable “is not supported by Frezzolini’s disclosure” and is directly contradicted by “Frezzolini’s teaching that AC power line 3 **and** DC power line 104 comprise the communication channel between control devices 7₁₋₄ and collecting unit 5.” *Id.* (citing Ex. 1005 ¶¶ 140–143, Fig. 9). Rather, Petitioner argues, Figure 9 shows two (plural) lines 104. *Id.* (citing Ex. 1005 ¶¶ 140–142, Fig. 9; Ex. 1020 ¶¶ 41–42).

¹⁹ Both Petitioner and Patent Owner agree that Frezzolini contains a typographical error and that TDA50051 (Ex. 1005 ¶ 45) actually refers the TDA5051 modem. Tr. 17:6–14, 47:16–23.

Petitioner also argues that Frezzolini does not, as Patent Owner argues, teach using a “‘hybrid communication channel’ comprising a dedicated data line and not power line 104.” Pet. Reply 10–11. Petitioner argues that Patent Owner “ignores Frezzolini’s teaching that the communication channel between Frezzolini’s control devices and collecting unit 5 is ‘mixed’—not hybrid—being constituted by power lines 3 and 104.” *Id.* (citing Ex. 1005 ¶¶ 140, 142, Fig. 9; Ex. 1020 ¶¶ 43–45).

Petitioner also argues that a person having ordinary skill in the art would have known that modems were used to transmit and receive data via power lines, and would have been motivated and able to implement PLC within a PV system—particularly one that uses separate lines for delivering power and data—to reduce costs and installation complexity associated with wiring dedicated/separate communication lines.

Pet. 26 (citing Ex. 1001, 2:11–25, 3:49–57; Ex. 1011 ¶¶ 95–96, 98, 100, 135–136, 140). Therefore, according to Petitioner, a person having ordinary skill in the art “would have been motivated to modify AAPA’s sub-generator junction box 1—using . . . Frezzolini’s PLC modem—to exchange data with inverter 5 via sub-generator line 4 and/or PV main DC power line 4’.” *Id.* at 27 (citing Ex. 1011, ¶¶ 139, 142, 144, 147–148). Petitioner further argues that the person having ordinary skill in the art “would have been motivated to use a PLC modem to exchange data over existing power lines for cost and efficiency reasons, as this would allow entities to immediately employ effective data communications/connectivity via existing power infrastructure with little (or no) additional wiring or investment.” *Id.* at 27–28 (citing Ex. 1011 ¶¶ 95–96, 98, 100, 136).

Petitioner also argues that the combination of AAPA with Frezzolini’s power line modem “merely involves combining known prior-art elements

. . . according to known methods . . . to yield predictable results.” Pet. 28 (citing Ex. 1011 ¶ 141). Petitioner also argues that the person having ordinary skill in the art would have had a reasonable expectation of success:

in combining AAPA with . . . Frezzolini. [Ex. 1011] ¶¶ 137-138, 141-143. First, a PHOSITA would have appreciated the benefit of []Frezzolini’s PLC techniques, and that this benefit would also have applied to AAPA’s PV system. *Id.*, ¶ 142. A PHOSITA would have recognized that []Frezzolini’s PLC modem would have operated with AAPA’s system to exchange data over power lines in the same manner as it operates in the []Frezzolini system—to control/monitor other devices within the system. *Id.*

Pet. 29. Petitioner also argues that “there would have been no undue technical hurdles to applying []Frezzolini’s PLC modem to AAPA’s system—adding []Frezzolini’s modem to AAPA’s sub-generator junction box to exchange data over sub-generator line 4 . . . would have been a simple modification to AAPA’s PV system, readily accomplished by a PHOSITA.” *Id.* (citing Ex. 1011 ¶ 143).

Petitioner also argues that Patent Owner’s argument that a person having ordinary skill in the art would not have combined AAPA with Frezzolini because one is a DC system and the other is an AC system is based on the false premise that Frezzolini is limited to AC systems. Pet. Reply 11–12.²⁰

(2) Patent Owner’s Arguments

Patent Owner argues that Frezzolini only teaches using a power line modem in the AC portion of Figure 9: “Frezzolini teaches that power line

²⁰ Petitioner also argues that a person having ordinary skill in the art would have modified a AC power line modem to work in a DC system. Pet. Reply 11–17. Because we find that Frezzolini teaches using a DC power line modem in a DC system, this argument is moot.

communication between the control devices 7 and the collecting device 5 takes place by the PLMs 14 over the AC power line 3.” PO Resp. 25 (emphasis omitted); *see also id.* at 25–34 (discussing argument).

Specifically, Patent Owner argues that Frezzolini Figure 9 “is incorrect schematically on its face, and that this system level error is readily appreciated by one of ordinary skill when evaluated in view of Fig. 2 and the associated description.” *Id.* at 25 (citing Ex. 2005 ¶ 54). Patent Owner argues that Figure 2 shows an AC power supply and that each of the commercially available modems identified in Frezzolini “***operate solely on AC power supply lines and do not operate on DC power lines.***” *Id.* at 26–27. Patent Owner further explains the differences between an AC and DC power supply. *Id.* at 27–28.

Patent Owner then argue that Frezzolini Figure 9 “appears to have an error in the drawing as it shows control devices 7₁ and 7₂ of Fig. 2 connecting to respective sensors 102 (e.g., electrical devices 1₁ and 1₂ of Fig. 2) and to an inverter 106 over a power line 104.” PO Resp. 29. According to Patent Owner, the DC voltage on power line 104 is high voltage and “cannot be handled properly by any component of any control device 7₁ according to Fig. 2.” *Id.* “Therefore,” Patent Owner argues, “while it is uncertain how Fig. 9 was supposed to be drawn schematically, what is certain is that Fig. 9 as shown is incorrect, as the figure as drawn renders control device 7₃ inoperable and the resultant system unsatisfactory for its intended purpose.” *Id.* at 30 (citing Ex. 2005 ¶ 56); *see also id.* at 30–31 (arguing Petitioner’s expert witness Dr. Wood conceded that Figure 9 is drawn incomplete).

Patent Owner further argues that, based on the incomplete drawings,

a reasonable interpretation of Frezzolini's Fig. 9 as drawn is that line 104 is a sheathed cable containing multiple electrical lines therein, wherein one line is a high voltage DC power line that extends into the inverter 106, and another line is either a dedicated data line, or a dedicated transmission bus (or an AC power line) that extends around the inverter 106 to the control device 7₃.

PO Resp. 32 (citing Ex. 2005 ¶ 58). According to Patent Owner, this is consistent with Frezzolini paragraph 140, which refers to "plural lines 104." *Id.* (emphasis omitted). As a result, Patent Owner argues, "Frezzolini discloses that Fig. 9 employs a mixed, hybrid communication channel, wherein the data travels from the control devices 7₁, 7₂ to the collecting unit 5 along a mixed channel." *Id.* (citing Ex. 1005 ¶¶ 142–143).

Patent Owner further argues how this is consistent with paragraph 143, which states that "when a power supply line is provided, this is preferably also used to transmit data and information between devices connected to this line." PO Resp. 33 (quoting Ex. 1005 ¶ 143). According to Patent Owner, "[a]s the DC power line 104 in Fig. 9 always exists, Frezzolini, when referencing the power supply line, must be referring to the AC power supply line 3 (Frezzolini also never refers to line 104 as 'power supply line')." *Id.*

Patent Owner further argues that its prosecution history "confirms use of solely PLC over AC type modems." PO Resp. 34 (citing Ex. 2011, 530).

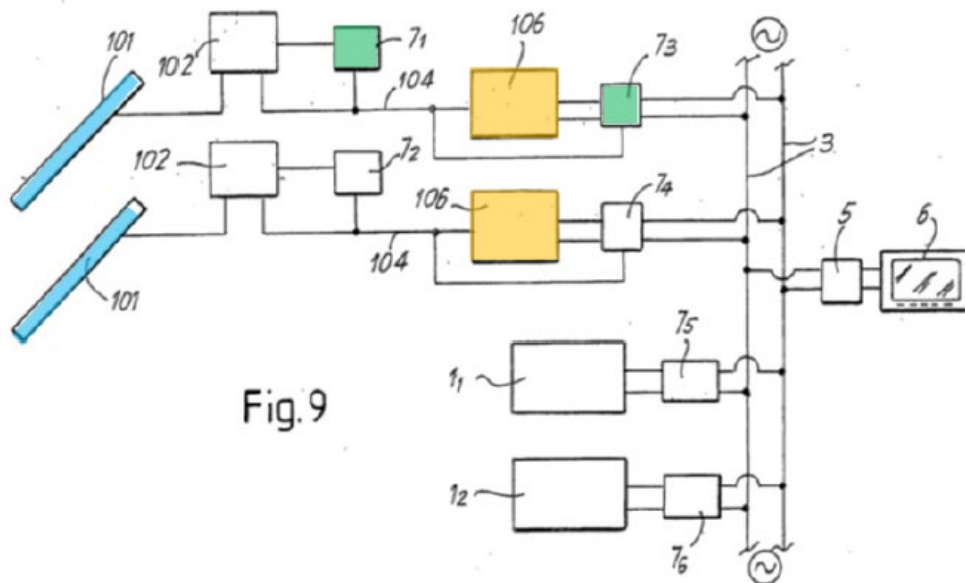
Patent Owner also argues that a person having ordinary skill in the art would not have combined AAPA with Frezzolini's power line modem. PO Resp. 35–46. Specifically, Patent Owner argues that each of the modems identified in Frezzolini operate on AC power. *Id.* at 35–37. Patent Owner further argues that because Dr. Wood did not identify the data sheets

regarding those modems, “the testimony provided by Petitioner’s expert should be given no deference in ascertaining whether Frezzolini teaches PLC over DC and whether the combination[] at issue (AAPA with . . . Frezzolini) [is] proper.” *Id.* at 37–39. Patent Owner further argues that there are significant technical issues between AC and DC power line modems that would make the addition of an AC power line modem to AAPA improper. *Id.* at 39–46.

(3) *Our Analysis*

For the reasons set forth below, Petitioner has shown that Frezzolini teaches a power line modem that can be used on a DC power line and that a person having ordinary skill in the art would have modified AAPA to use that power line modem.

Frezzolini Figure 9, as annotated by Petitioner, is reproduced below.



Pet. 15. Frezzolini Figure 9 “shows a block diagram of a different system in which the method according to the invention may be applied.” Ex. 1005 ¶ 41. Figure 9 has been annotated by Petitioner to identify PV panels 101

(blue), inverters 106 (orange), and associated control devices 7₁ and 7₃ (green). *See* Pet. 15.

PV panels 101 produce DC current which is transmitted over power lines 104 to inverters 106 for conversion to AC current. *See* Ex. 1011 ¶ 132; Ex. 1005 ¶ 140; *see also* Ex. 2004 (describing how PV cells produce DC current which is transformed by an inverter into AC current) (How Solar Technology Works). Because the PV cells produce DC current and that current is not transformed into AC current until it reaches the inverter, lines 104 are DC power lines.

We find that “Frezzolini teaches that although communications between control devices 7_i and the collecting unit 5 may occur via radio waves, or via a dedicated data line, or via a transmission bus, or via another ‘suitable way,’ a power supply line is preferable and is ‘advantageous.’” Ex. 1011 ¶ 132 (citing Ex. 1005 ¶¶ 16, 17, 143); *see also* Ex. 1005 ¶ 16 (“In this case transmission occurs via power line carrier transmission on the power supply line by means of modems specifically produced for this function and known as PLM (Power Line Modem).”). Frezzolini further teaches that when data is transmitted over power lines, a power line modem is used. Ex. 1005 ¶ 16; Ex. 1011 ¶¶ 129–130. Frezzolini further teaches that “when a power supply line is provided, this is preferably also used to transmit data and information between devices connected to this line.” Ex. 1005 ¶ 143. Because power line 104 is connected between control device 7₁ and inverter 106 (*Id.* ¶ 140, Fig. 9), control device 7₁, which is connected to DC power line 104, includes a power line modem to transmit and receive data to

the inverter. Ex. 1011 ¶ 132. And because, as discussed above, power line 104 is a DC power line, control 7₁ uses a DC power line modem.²¹

The use of a DC power line modem is consistent with supporting evidence offered by Petitioner. For example, Frezzolini identifies Philips TDA5051 as an exemplary modem that could be used. Ex. 1005 ¶ 45. The Application Note for that modem states that it could be used in either a DC or AC network: “It could be also used on any two wire network for exchanging information[] by means of ASK carrier current technique (DC or AC network).” Ex. 1021, 3. Similarly, the Petition identified various power line communication (“PLC”) systems that involved DC networks. *See* Ex. 1015, 1070 (Intelligent PV Module for Grid-Connected PV Systems) (cited at Pet. 8); Ex. 1011 ¶ 94 (discussing a PLC in a PV system with solar panels (DC network)) (cited at Pet. 26).

The parties both agree that Frezzolini Figure 9 is not complete; however, they disagree as to what is missing. For example, Dr. Wood testified that controller 7₃ must have two modems, one for the DC power line and the other for the AC power line. Ex. 2006, 74:4–76:14. Dr. Wood specifically testified that “the simple answer is we don’t know exactly what Frezzolini had in mind for what goes into [7₁] through [7₃], except we know that they contain modems.” *Id.* at 76:11–14. On the other hand, Dr. Blackburn modifies Frezzolini Figure 9 by turning power line 104 into a sheathed cable containing multiple electrical lines including a high voltage DC power line and a dedicated data line/transmission bus/AC power line. Ex. 2005 ¶¶ 58–59.

²¹ A DC power line modem is one that operates on a DC power line. *See* Tr. 36:7–18.

We do not find either expert's modification particularly helpful. Each expert simply looks at the drawing and modifies it in a way that helps their argument but, importantly, is inconsistent with the text of Frezzolini. For example, Frezzolini only shows a control device 7 with a single modem (*See* Ex. 1005 ¶ 45, Fig. 2) and Dr. Wood does not cite to any section of Frezzolini to support using two modems.

Similarly, with regard to Dr. Blackburn's testimony Frezzolini refers to power line 104 without any indication there is a sheath containing multiple electrical lines. *See* Ex. 1005 ¶ 140. Although paragraph 140 refers to lines 104, based on the context and Figure 9, it is clear that it is referring to the different lines used to connect various panels 101 to inverters 106. Additionally, paragraph 143 simply teaches that "a different communication channel" can be used besides that power line; but, "*when* a power supply line supply line is provided, this is *preferably* also used to transmit data and information." Ex. 1005 ¶ 143 (emphases added). The use of "when" simply reinforces the preference. *See id.* It does not support Dr. Blackburn's argument (Ex. 2005 ¶ 58) that the power line 3 must extend between devices 7₁, 7₂ and 7₃, 7₄, respectively. Nothing in paragraph 143 states or implies such an unillustrated connection.

We give no weight to that unsupported testimony. *See In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) ("[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations."); *Verlander v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) (Board has discretion to accord little weight to broad conclusory statements from expert witness); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985) (noting that the "[l]ack of factual

support” for an expert opinion “may render the testimony of little probative value”); 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

In the end, it does not matter which, if either, expert is correct. If a person having ordinary skill in the art is able to make Frezzolini Figure 9 operate, consistent with its disclosure, then, as discussed above, control 7₁ must use a DC power line modem. But even if Frezzolini’s Figure 9 is inoperative, it is still useful for all that it teaches. *See Geo. M. Martin Co. v. All. Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1302 (Fed. Cir. 2010) (“Under an obviousness analysis, a reference need not work to qualify as prior art; ‘it qualifies as prior art, regardless, for whatever is disclosed therein.’ *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1357 (Fed. Cir. 2003). ‘Even if a reference discloses an inoperative device, it is prior art for all that it teaches.’ *Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989).”). Therefore, even if Frezzolini Figure 9 is inherently inoperable as drawn, because it shows a power line modem on a DC powerline, a person having ordinary skill in the art would recognize that it teaches using a DC powerline modem.

We disagree with Patent Owner’s argument that Frezzolini’s prosecution history only supports using AC power line modems. Although Dr. Blackburn testifies that “[a]t no point in the extensive prosecution history did Frezzolini make any suggestion that the communication across the network was a DC network,” (Ex. 2005 ¶ 60), neither Dr. Blackburn nor Patent Owner point to any statement in the prosecution history that states that it is limited to AC networks. *See* PO Resp. 34; Ex. 2005 ¶ 60. Although the small snippet from the prosecution history cited by Patent

Owner describes it being used in examples that use AC, the prosecution history does not state that the invention is limited to those specified examples. *See* PO Resp. 34 (quoting Ex. 2011, 530). Moreover, even if Frezzolini decided to limit his claims to AC networks—and there is no evidence that he did so—that does not imply that the specification is similarly limited as claims may be narrower than the written description.

We further find that a person having ordinary skill in the art would have modified AAPA’s sub-generator junction box 1 with Frezzolini’s DC power line modem to exchange data with inverter 5 via sub-generator line 4 and/or PV main DC power line 4’. *See* Ex. 1011, ¶¶ 139, 142, 144, 147–148. Specifically, a person having ordinary skill in the art would have used the power line to transmit information cost and efficiency reasons, as this would allow entities to immediately employ effective data communications/connectivity via existing power infrastructure with little (or no) additional wiring or investment. Ex. 1011 ¶¶ 95–96, 98, 100, 136; *see also* Ex. 1005 ¶¶ 4, 16; Ex. 1003 ¶ 59. Moreover, because power line modems were used in the prior art (*see, e.g.*, Ex. 1011 ¶¶ 88–102), this “would have been nothing more than a combination of prior art elements . . . according to known methods . . . to obtain a predictable result.” Ex. 1011 ¶ 141. As a result, AAPA as modified by Frezzolini would result in “the PV inverter 5, PV sub-generator junction box 1, and/or PV generator junction box 6 having a PLC modem that enables the exchange of data, such as control data or measurement data, over power lines, rather than via dedicated data communication lines.” *Id.*; *see also id.* ¶ 142. Furthermore, the person having ordinary skill in the art would have had a reasonable expectation of success. *Id.* ¶ 143.

Patent Owner's remaining arguments focus on the difficulties of using an AC power line modem in the AAPA's DC network. *See* PO Resp. 11–16. However, because we find that Frezzolini teaches using a DC power line modem, those arguments are moot.

c) *“Wherein the Data Receivable from the Central Control Unit Within the PV Inverter by the Power Line Modem Comprises Corresponding Control Data”*

Claim 1 further recites “wherein the data receivable from the central control unit within the PV inverter by the power line modem comprises corresponding control data.” Ex. 1001, 11:9–11.

Petitioner argues “AAPA's control unit 10 of sub-generator junction box 1 receives control data from central control unit 7 of inverter 5 to activate switching means.” Pet. 30 (citing Ex. 1001, 3:34–48, 8:1–8). Petitioner further argues that “it would have been obvious to modify AAPA's sub-generator junction box 1 to use [Frezzolini's] PLC modem to exchange data (e.g., control data) with inverter 5 via power lines.” *Id.* at 31 (citations omitted).

Patent Owner argues that “Frezzolini disclose a power line modem that transmits or receives data over an AC power line and not over a DC power line.” PO Resp. 46 (emphasis omitted). According to Patent Owner, as Frezzolini does not teach or suggest “a PLC over DC type modem, but rather disclose a PLC over AC type modem, the combination of AAPA with Rodgers or Frezzolini fails to render obvious this feature . . . of claim 1.” *Id.* at 47.

AAPA teaches using data transmitted from the inverter to the sub-generator box to control electrical outputs. Ex. 1001, 8:1–8. Additionally, as discussed above, a person having ordinary skill in the art would have

modified AAPA to use Frezzolini's DC power line modem for communications, including the control signals from the inverter. (For the same reason as discussed above, we do not agree with Patent Owner's argument that Frezzolini is limited to an AC power line modem.) Accordingly, AAPA as modified by Frezzolini's DC modem teaches this limitation.

d) Conclusion Regarding Claim 1

We have considered the evidence submitted by the parties and determine that Petitioner has shown by a preponderance of the evidence that claim 1 of the '048 patent would have been obvious over AAPA and Frezzolini.

2. Analysis of Claims 2, 3, 5 and 7

Petitioner also argues that the combination of AAPA and Frezzolini teaches the limitations recited in claims 2, 3, 5, and 7. *See* Pet. 31–48.

Besides the arguments discussed above for claim 1, Patent Owner did not separately address Petitioner's arguments directed to claims 2, 3, 5, and 7. *See* PO Resp 47–48.

Based on the evidence and arguments presented in the Petition, which are not otherwise argued by Patent Owner, we determine that Petitioner has demonstrated by a preponderance of the evidence that the subject matter of claims 2, 3, 5, and 7 would have been obvious over the combined teachings of AAPA and Frezzolini.

G. Ground 2: AAPA, Frezzolini, and Iwamura

1. Analysis of Claim 4

a) Undisputed Limitations

The preamble²² and first limitation of claim 4 recites “[a] photovoltaic (PV) generator junction box for a PV system, comprising: a plurality of sub-generator line terminals for connection to respective PV sub-generator lines of PV sub-generator junction boxes.” Ex. 1001, 11:27–31. Petitioner argues AAPA teaches the preamble and first limitation. Pet. 49–50. Specifically, Petitioner argues that “AAPA’s PV system includes a generator junction box 6 . . . connected—via sub-generator lines 4—to respective sub-generator junction boxes.” Pet. 49 (citations omitted). Petitioner further argues that a person having ordinary skill in the art “would have understood that terminals (‘sub-generator line terminals’) are used to connect sub-generator lines 4 to AAPA’s generator junction box 6.” *Id.* at 50 (emphasis omitted).

Claim 4 further recites “a main DC power line terminal for connecting a PV main DC power line of a remote central PV inverter.” Ex. 1001, 8:32–33. Petitioner argues AAPA teaches that limitation. Pet. 50–51. Specifically, Petitioner argues that “AAPA’s generator junction box 6 . . . is connected to inverter 5 . . . via main DC power line 4’.” Pet. 50 (citations omitted).

²² What Petitioner has identified as the first limitation includes the preamble of the claims. Neither Petitioner nor Patent Owner address whether the preamble is limiting. Because Petitioner has shown that the recitation in the preamble is satisfied by the prior art, there is no need to determine whether the preamble is limiting. *See Nidec*, 868 F.3d at 1017.

Claim 4 further recites “at least one of a main circuit breaker for disconnecting the PV main power line and a collective circuit breaker for disconnecting a respective one of the PV sub- generator lines.” Ex. 1001, 11:34–37. Petitioner argues that a person having ordinary skill in the art would have modified AAPA to include that limitation. Pet. 51–54.

Specifically, Petitioner argues circuit breakers were known in the art and included in AAPA’s sub-generator boxes. *Id.* 51–52. Petitioner further argues that a person having ordinary skill in the art would have expected that the related generator junction box would also have included circuit breakers and

would have been motivated to implement or replicate circuit breakers 15 and 20 of sub-generator junction box 1—which enable the selective disconnecting of input and/or output power lines (respectively)—within AAPA’s generator junction box 6 to provide added safety, flexibility and increased power flow control within the PV system.

Id. at 52–53 (citations omitted). According to Petitioner, such a modification involves using known elements to yield predictable results and that a person having ordinary skill in the art would have had a reasonable expectation of success. *Id.* at 53–54 (citations omitted).

Based on the undisputed evidence before us and the reasons set forth in the Petition, including the Wood Declaration, which are not addressed by Patent Owner (*see* PO Resp.), we are persuaded that AAPA teaches a “(PV) generator junction box” including “a plurality of sub-generator line terminals . . . ,” “a main DC power line terminal . . . ,” and “at least one of a main circuit breaker . . . and a collective circuit breaker” as recited in claim 4.

b) *The “Data Signal Coupler” Limitation*

(1) *Petitioner’s Arguments*

Claim 4 also recites:

a data signal coupler connected in parallel to a respective circuit breaker of the at least one of the main circuit breaker and the collective circuit breaker, so that data to be transferred between the respective PV sub-generator line and the PV main DC power line is also able to be forwarded through the data signal coupler when the respective circuit breaker is in an open state.

Ex. 1001, 11:37–43.

Petitioner argues the combination of AAPA, Frezzolini, and Iwamura teaches this limitation. Pet. 54–59. Specifically, Petitioner argues that a person having ordinary skill in the art would have modified AAPA to include Frezzolini’s power line modem. *Id.* at 54–55. Petitioner further argues that PLC systems have a problem transferring data across open circuit breakers. *Id.* at 56 (citing Ex. 1003 ¶¶ 3, 34, code (57); Ex. 1006 ¶ 47; Ex. 1011 ¶¶ 121, 171, 177, 178, 197). According to Petitioner, in order to overcome that problem, a person having ordinary skill in the art would have added Iwamura’s signal coupler to maintain data communication even when a switch is open. *Id.* at 56–57 (citing Ex. 1006 ¶¶ 48, 58, 59, Fig. 7; Ex. 1011 ¶¶ 172, 180–182, 195, 198, 199, 209, 210, 229[4D]). Petitioner argues that such a modification would have involved using known elements to achieve predictable results and that a person having ordinary skill in the art would have reasonably expected the modification to work. *Id.* at 57–59.

Petitioner also argues that Patent Owner’s argument “that Iwamura’s . . . data signal couplers only function on AC power lines—not DC power lines—and that a PHOSITA couldn’t place an AC data signal coupler on a DC line . . . is legally and factually incorrect.” Pet. Reply 20. Specifically,

Petitioner argues that “obviousness does not require that an element from one reference be bodily incorporated into another without change.” *Id.* (citing *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973)). Petitioner further argues that “Iwamura teaches a data signal coupler for bypassing open circuit breakers operating on a DC power line.” *Id.* (citing Ex. 1006 ¶¶ 58–59; Ex. 1020 ¶¶ 88, 102).

Petitioner also argues that even if “Iwamura’s data couplers are configured for exclusive use on AC power lines, [Patent Owner’s] argument improperly treats a PHOSITA as an automaton devoid of any creativity or independent judgement.” Pet Reply 22 (citing *KSR*, 550 U.S. at 420–421). Petitioner further argues that any modifications needed were “simple and routine adjustments well within the knowledge and skill of a PHOSITA.” *Id.* at 22–23 (citing Ex. 1020 ¶ 90); *see also id.* at 23 (arguing that a person having ordinary skill in the art make minor adjustments so that an AC-type data coupler could work on a DC line (citing Ex. 1020 ¶¶ 91–92, 102)).

(2) Patent Owner’s Arguments

In addition to the arguments made regarding claim 1, Patent Owner argues that “using a data signal coupler for a PLC over AC solution, as taught in . . . Iwamura, will not work in a PLC over DC environment, as exists in AAPA, and thus the combination is improper, and even if proper, fails to result in the claimed invention.” PO Resp. 51. Specifically, Patent Owner argues that “Iwamura employs a galvanic coupler 726 to couple signals onto an AC power supply line 722, and a data coupler 742 couples such signals from the AC power mains to the AC power load when the circuit breaker 736 is open.” *Id.* (citing Ex. 1006, Fig. 7, ¶¶ 48–59; Ex. 2005 ¶ 78). Patent Owner further argues that “a data signal coupler designed for an AC power supply line is different than a data signal coupler designed for

a DC power line.” *Id.* at 52 (emphasis omitted) (citing Ex. 2005 ¶ 83); *see also id.* (discussing differences). Therefore, according to Patent Owner, “the proposed modification of AAPA with . . . Iwamura would not enable devices in the AAPA to transmit data across the DC power lines, and thus would not solve the problem at issue.” *Id.* at 53; *see also id.* at 53–54 (expanding upon problem).

(3) *Our Analysis*

For the reasons discussed below, Petitioner has sufficiently shown that (1) Frezzolini teaches a power line modem that can be used on a DC power line, (2) Iwamura teaches a data signal coupler to transmit data when a switch/circuit breaker is open, and (3) that a person having ordinary skill would have modified AAPA to use Frezzolini’s power line modem and a data signal coupler as taught by Iwamura for PLC communications when the circuit breakers are open.

Specifically, as discussed in subsection F.1.b.(3) above, Petitioner has shown that a person having ordinary skill in the art would have modified AAPA to use Frezzolini’s DC power line modem for power line communication.

Furthermore, Iwamura teaches that the power line cannot be used for communication when a circuit breaker/switch is open. Ex. 1006 ¶ 58. However, Iwamura also teaches a solution to that problem: placing a data signal coupler (PLC signal coupler 742) in parallel with the switch to allow communication when the switch is open. *See id.* ¶ 58, Fig. 7; Ex. 1011 ¶¶ 172–174. A person having ordinary skill in the art would have modified AAPA/Frezzolini to use a data signal coupler in order to allow communication when the circuit is open and would have had a reasonable

expectation of success. *See* Ex. 1011 ¶¶ 175–227.²³ That is, a person having ordinary skill in the art would have been motivated to modify AAPA’s generator junction box 6 to include Iwamura’s data line coupler so as to maintain a communication path even when the circuit breaker of the generator junction box is open. *See* Ex. 1011 ¶¶ 180–184, 195–199, 229[4D].

We do not agree with Patent Owner’s argument that Iwamura’s PLC signal coupler 742—which Patent Owner argues is intended for an AC power line—would not work on AAPA’s DC power line and, therefore, the combination is not obvious. The test for obviousness “is not whether the features of a secondary reference can be bodily incorporated into the structure of the primary reference.” *MCM Portfolio LLC v. Hewlett-Packard Co.*, 812 F.3d 1284, 1294 (Fed. Cir. 2015) (quoting *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)). Rather, the question is “whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.” *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc) (noting that whether one prior art reference can be incorporated into another is “basically irrelevant.”). Iwamura broadly teaches using a data signal coupler to provide an alternate data path when a circuit breaker switch is open. *See* Ex. 1006 ¶ 58. That teaching is not limited to AC power lines. And Petitioner has shown that person having ordinary skill in the art would have been able to apply those broad teachings to a DC power line. *See* Ex. 1020 ¶¶ 90–92, 96. Mr. Blackburn, Patent Owner’s expert witness, was unable to

²³ Here and elsewhere, some of the cited paragraphs of the Wood Declaration discuss both Rodgers and Iwamura. We are only relying on the discussion of Iwamura.

say whether such a modification would be beyond the ability of a person having ordinary skill in the art. Ex. 1019, 260:13–261:20.

Moreover, we do not agree with Patent Owner that Iwamura is limited to an AC power line signal coupler. Instead, Iwamura teaches using any type of “relevant coupler”:

In some embodiments, the breaker PLC signal coupler 742 can include a transducer and may be an inductive coupler such as toroid coupling transformer, a capacitive coupler *or other relevant coupler or combination of couplers*, for coupling PLC data through the PLC circuit breaker 720.

Id. ¶ 59 (emphasis added); *see also* Ex. 1011 ¶ 174 (“Iwamura also makes clear that these breakers may be used at various points in the PLC system and in various configurations.” (citing Ex. 1006 ¶ 59)). Accordingly, a person having ordinary skill in the art would have selected a relevant data signal coupler for AAPA’s DC power lines. *See* Ex. 1006 ¶ 59; Ex. 1011 ¶¶ 174, 180, 183, 185.

c) Conclusion Regarding Claim 4

We have considered the evidence submitted by the parties and determine that Petitioner has shown by a preponderance of the evidence that claim 4 of the ’048 patent would have been obvious over AAPA, Frezzolini, and Iwamura.

2. Analysis of Claims 6 and 8–10

Petitioner also argues that the combination of AAPA, Frezzolini, and Iwamura teaches the limitations recited in claims 6 and 8–10. *See* Pet. 59–75.

Besides the arguments discussed above for claim 1, Patent Owner did not separately address Petitioner’s arguments directed to claims 6 and 8–10. *See* PO Resp 54.

Based on the evidence and arguments presented in the Petition, which are not otherwise argued by Patent Owner, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 6 and 8–10 would have been obvious over the combined teachings of AAPA, Frezzolini, and Iwamura.

H. Remaining Grounds

Because we determine that all of the challenged claims would have been obvious under 35 U.S.C. § 103(a) in view of AAPA and Frezzolini or in view of AAPA, Frezzolini, and Iwamura, we do not address the parties' arguments regarding (1) AAPA and Rodgers or (2) AAPA, Richter, and Rodgers. *See Boston Scientific Scimed, Inc. v. Cook Gp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. 2020) (“We agree that the Board need not address issues that are not necessary to the resolution of the proceeding.”).

I. Weight Given to Dr. Wood's Testimony

Patent Owner argues that we should give little or no weight to Dr. Wood's testimony because (1) he failed to appreciate the difference between AC and DC networks and (2) he relied on evidence—data sheets for the TDA5051 modem—not submitted with the Petition. *See* PO Resp. 17; PO Sur-reply 12–17. In analyzing the weight given to expert testimony in this case, we have considered whether it is consistent with supporting evidence in the record. To the extent we rely on Dr. Wood's testimony, we find it both credible and supported by evidence in the record.

We specifically disagree with Patent Owner's characterization of Dr. Wood's testimony as ignoring the difference between AC and DC systems. Although Dr. Wood may not have explicitly discussed the differences between AC and DC systems, that difference was taken in to account in his testimony by his reliance on PV systems, which are examples

of DC networks. *See* Ex. 1011 ¶¶ 123, 132. Having focused on DC systems—or at least what he testified were DC systems—Dr. Wood showed an appreciation for the need of a DC powerline modem.

To the extent that Patent Owner believes that Petitioner violated our rules by not providing the data sheets with the Petition, the proper course of action would be to file an objection and provide Petitioner an opportunity to cure it with supplemental evidence. *See* 37 C.F.R. § 42.64(b)(1), (2). Because the evidence are part of the record (*see* Ex. 2007–2010), there is no basis to exclude that portion of Dr. Wood’s testimony where he relied on them. Moreover, we note that Patent Owner never filed a motion to exclude any portion of Dr. Wood’s testimony or any evidence in the record. “A motion to exclude evidence *must be filed* to preserve *any* objection.” 37 C.F.R. § 42.64(c) (emphases added). Because no motion to exclude was filed, all evidentiary objections were forfeited.

CONCLUSION²⁴

For the foregoing reasons, we conclude that Petitioner has demonstrated by a preponderance of the evidence the unpatentability of claims 1–10 of the ’048 patent. Specifically, Petitioner has demonstrated by a preponderance of the evidence that (1) claims 1–3, 5, and 7 would have

²⁴ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

been obvious under 35 U.S.C. § 103(a) in view of AAPA and Frezzolini and (2) claims 4, 6, and 8–10 would have been obvious under 35 U.S.C. § 103(a) in view of AAPA, Frezzolini, and Iwamura. Accordingly, we grant Petitioner’s Request for Rehearing.

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner’s request for rehearing is *granted*;

FURTHER ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–10 of the ’048 patent are unpatentable; and

FURTHER ORDERED that because this is a Decision on Rehearing of 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.

Outcome of Decision on Rehearing:

Claims	35 U.S.C §	Reference(s)/Basis	Denied	Granted
1-10	103(a) ²⁵	AAPA, Rodgers		
1-3, 5, 7	103(a)	AAPA, Frezzolini		1-3, 5, 7
4, 6, 8, 10	103(a)	AAPA, Frezzolini, Iwamura		4, 6, 8-10
4-10	103(a) ²⁶	AAPA, Richter, Rodgers,		
Overall Outcome				1-10

Final Outcome of Final Written Decision after Rehearing

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1-10	103(a) ²⁷	AAPA, Rodgers		
1-3, 5, 7	103(a)	AAPA, Frezzolini	1-3, 5, 7	
4, 6, 8-10	103(a)	AAPA, Frezzolini, Iwamura	4, 6, 8-10	
4,10	103(a) ²⁸	AAPA, Richter, Rodgers		
Overall Outcome			1-10	

²⁵ As explained above, because we determine that the challenged claims are unpatentable in light of (1) AAPA and Frezzolini and (2) AAPA, Frezzolini, and Iwamura, we decline to address this ground.

²⁶ As explained above, because we determine that the challenged claims are unpatentable in light of AAPA, Frezzolini, and Iwamura, we decline to address this ground.

²⁷ As explained above, because we determine that the challenged claims are unpatentable in light of (1) AAPA and Frezzolini and (2) AAPA, Frezzolini, and Iwamura, we decline to address this ground.

²⁸ As explained above, because we determine that the challenged claims are unpatentable in light of AAPA, Frezzolini, and Iwamura, we decline to address this ground.

IPR2020-00021
Patent 8,922,048 B2

FOR PETITIONER:

Frederic Meeker
John R. Hutchins
Azuka C. Dike
Kurt C. Riester
Zachary Getzelman
BANNER & WITCOFF, Ltd.
fmeeker@bannerwitcoff.com
jhutchins@bannerwitcoff.com
adike@bannerwitcoff.com
kriester@bannerwitcoff.com
zgetzelman@bannerwitcoff.com
SolaredgeIPRService@bannerwitcoff.com

FOR PATENT OWNER:

Steven H. Slater
Michael Kucher
John D. Koetter
SLATER MATSIL, LLP
sslater@slatermatsil.com
mkucher@slatermatsil.com
jkoetter@slatermatsil.com

Thomas G. Eschweiler
ESCHWEILER & POTASHNIK, LLC
teschweiler@epiplaw.com