

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

MYPAQ HOLDINGS LTD.,
Patent Owner.

IPR2022-00308
Patent 7,978,489 B1

Before KRISTINA M. KALAN, DANIEL J. GALLIGAN, and
ELIZABETH M. ROESEL, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Samsung Electronics Co., Ltd. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 of U.S. Patent No. 7,978,489 B1 (Ex. 1001, “the ’489 patent”). MyPAQ Holdings Ltd. (“Patent Owner”) filed a Preliminary Response (Paper 7, “Prelim. Resp.”). Pursuant to Board authorization, Petitioner filed a Reply to the Patent Owner Preliminary Response (Paper 9, “Reply”) and Patent Owner filed a Sur-Reply to Petitioner’s Reply (Paper 10, “Sur-Reply”).

To institute *inter partes* review, we must determine that the information presented in the Petition shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons discussed below, after considering the parties’ submissions and the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the ’489 patent, and we institute *inter partes* review of all claims and all grounds asserted in the Petition.¹

A. Related Proceedings

The parties identify the following district court litigation as a related matter: *MyPAQ Holdings Ltd. v. Samsung Electronics Co.*, No. 6:21-CV-00398 (W.D. Tex.). Pet. 1; Paper 8, 1 (Patent Owner’s updated mandatory notices).

¹ *Guidance on the Impact of SAS on AIA Trial Proceedings* (Apr. 26, 2018), <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial>; *see also SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

The parties also state that Petitioner has filed petitions regarding other patents held by Patent Owner: IPR2022-00307 regarding U.S. Pat. No. 7,403,399, IPR2022-00311 regarding U.S. Pat. No. 8,477,514, and IPR2022-00312 regarding U.S. Pat. No. 7,675,759. Pet. 1; Paper 8, 1.

B. Real Parties-in-Interest

Petitioner identifies Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., Samsung Semiconductor, Inc., and Samsung Austin Semiconductor as the real parties-in-interest. Pet. 1. Patent Owner states that the “real party in interest is: MyPAQ Holdings Ltd. Transpacific IP Group Limited has an ownership interest in MyPAQ.” Paper 8, 1.

C. The '489 Patent

The '489 patent is titled “Integrated Power Converters” and is directed to a power supply adapter that “includes a power converter circuit configured to generate a regulated voltage signal,” where the power converter circuit is coupled to AC power blades. Ex. 1001, codes (54), (57). As background, the '489 patent explains that in “many applications a power supply apparatus includes a separate enclosure for housing a pair of AC power blades and also includes another container for enclosing the electrical components of a power converter circuit.” *Id.* at 1:19–22. The '489 patent describes a power supply adapter that incorporates power supply components into an “integrated enclosure.” *Id.* at 1:29–31, 1:35–47. Figure 1A is reproduced below.

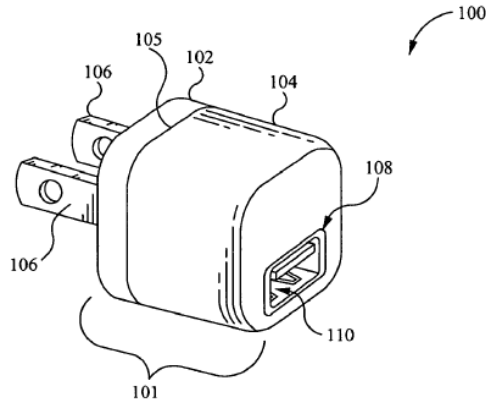


Fig. 1A

Figure 1A is a perspective view of a power supply adapter. *Id.* at 2:18–19. Figure 1A shows power supply adapter 100 that includes AC power adapter 100, AC power blades 106, which insert into an AC power source, and connector receptacle 110, which couples to a power connector (not shown) to power electronic devices. *Id.* at 3:34–40. “The adapter 100 provides the enclosure 101 for a power converter circuit (not shown) as well as functioning as the enclosure 101 for the AC power blades 106.” *Id.* at 3:29–32. Figure 2B, reproduced below, is a cross-sectional view of the power supply adapter and shows certain elements inside the power supply adapter enclosure. *Id.* at 2:25–27, 5:16–17.

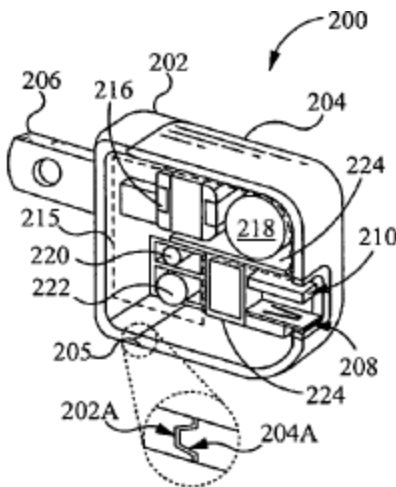
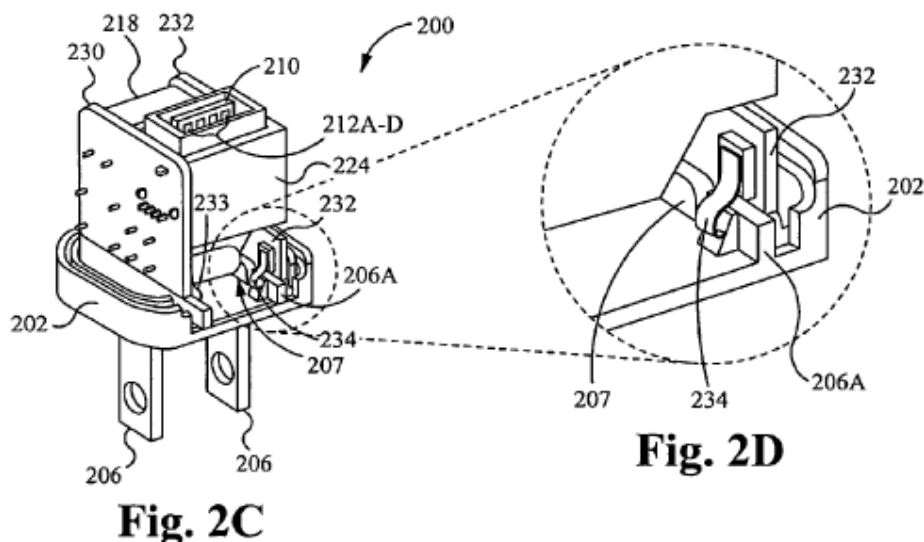


Fig. 2B

As shown in Figure 2B, “power converter circuit 215 comprises an input rectifier 220, a regulator circuit 222, an output transformer 216 and an output capacitor 218.” *Id.* at 5:17–19. Input rectifier 220 “converts an AC power source entering through the AC power blades 206 into a rectified voltage signal” which “is coupled with the regulator circuit 222, which generates a regulated voltage signal.” *Id.* at 5:24–28. “The regulated voltage signal is a constant voltage that is coupled to the output transformer 216.” *Id.* at 5:28–29. Output transformer 216 “provides electromagnetic coupling of the regulated voltage signal to the output capacitor 218, such that a regulated DC voltage is provided at the connector receptacle 210.” *Id.* at 5:34–38. Further, power converter circuit 215 is housed in the power supply adapter enclosure via first and second printed circuit boards (PCBs) (not shown in Figure 2B; *see* Figure 2C, below). *Id.* at 4:3–7. The first and second PCBs “provide a mechanical support and an electrical interconnection for electronic components of the power converter circuit 215 which are mounted thereon.” *Id.* at 4:59–63.

Figures 2C and 2D are reproduced below.



Figures 2C and 2D are perspective views showing additional details and components of a power supply adapter with Figure 2D showing a partial enlarged perspective view of features of Figure 2C. *Id.* at 2:25–33, 3:58–60. As shown in Figure 2C, and in the partial enlargement of Figure 2D, the “first and the second spring contacts 233, 234 provide an electrical coupling of the AC power source through the AC power blades 206 to the power converter circuit 215” (power converter circuit 215 shown in Figure 2B, above). *Id.* at 5:8–11. Further, “first and the second spring contacts 233, 234 are flexibly biased to securely couple with a proximate end 206A of the AC power blades 206” and “comprise suitable conductors coupled on a periphery of the first and the second [PCBs] 230, 232.” *Id.* at 5:4–8, 8:35–37. First and the second spring contacts 233, 234 “comprise a suitable flexible, durable and conductive material. In an exemplary embodiment, the spring contacts 233, 234 comprise a metallic material of appropriate thickness.” *Id.* at 5:11–15.

D. Illustrative Claim

Claim 1 is reproduced below.

1[pre]. A power supply adapter comprising:

1[a] a power converter circuit configured to generate a regulated voltage signal, the power converter circuit including,

1[b] a rectifier coupled with AC power blades;

1[c] a regulator circuit coupled with the rectifier;

1[d] a transformer coupled with the regulator circuit, the transformer including a primary and a secondary, the transformer being coupled with the regulator circuit via the primary;

1[e] an output circuit coupled with the secondary of the transformer, the output circuit including an output capacitor; and

1[f] a flexible contact coupled with each of a first and a second printed circuit board and flexibly biased to couple with a proximate end of the AC power blades.

Ex. 1001, 14:39–53 (bracketed designations added by Petitioner (*see* Pet. vi)).

E. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1, 4, 11, 12, 22, 25, 32, 33, 40–43, 46, 53, 54, 56, 61–63	§ 103	Gilliland, ³ Vista ⁴
5, 6, 26, 27, 47, 48	§ 103	Gilliland, Vista, Jie ⁵
7–9, 28–30, 49–51	§ 103	Gilliland, Vista, Peck ⁶
10, 31, 52	§ 103	Gilliland, Vista, Peck, Cheng ⁷
39, 58–60	§ 103	Gilliland, Vista, Liao ⁸
57	§ 103	Gilliland, Vista, Liao, Cheng

In support of its unpatentability arguments, Petitioner relies on the declaration of Dr. Sayfe Kiaei. Ex. 1004.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the ’489 patent has an effective filing date prior to the effective date of the applicable AIA amendments, we refer to the pre-AIA version of § 103.

³ US 7,101,226 B1, issued September 5, 2006 (Ex. 1005).

⁴ US 6,644,984 B2, issued November 11, 2003 (Ex. 1006).

⁵ CN 1812208 A, published August 2, 2006 (Ex. 1007). Exhibit 1007 includes a copy of the original document and a certified translation. Ex. 1007, 71; *see* Pet. iv.

⁶ US 2004/0257190 A1, published December 23, 2004 (Ex. 1008).

⁷ US 6,081,425, issued June 27, 2000 (Ex. 1009).

⁸ US 2003/0151938 A1, published August 14, 2003 (Ex. 1010).

II. ANALYSIS

A. Claim Construction

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). 37 C.F.R. § 42.100(b) (2021). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. The “ordinary and customary meaning of a claim term 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.” *Id.* at 1313. Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms ... that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

Petitioner states that it “has applied the plain and ordinary meaning of the claims herein.” Pet. 14. Patent Owner similarly states that it “interprets all claim terms in accordance with their plain and ordinary meaning.” Prelim. Resp. 11. On this record, we determine that no claim terms require express construction.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art would have either (i) a Master of Science in Electrical Engineering, Mechanical Engineering or a related field, or (ii) a Bachelor of Science in Electrical Engineering, Mechanical Engineering or a related field as well as at least two years of experience in the design and/or packaging of power electronics. Additional education could compensate for less practical experience and vice versa.

Pet. 14 (citing Ex. 1004 ¶¶ 36–38).

Patent Owner states that for “purposes of this Preliminary Response only, Patent Owner does not dispute the Petition’s definition of level of ordinary skill.” Prelim. Resp. 11. Accordingly, for the purposes of this Decision, we adopt Petitioner’s proposal regarding the level of one of ordinary skill in the art with the exception of the open-ended phrase “at least,” which expands the range of experience indefinitely without an upper bound. The level of ordinary skill in the art is also reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

C. Discretion under 35 U.S.C. § 314(a)

Patent Owner argues the Board should exercise its discretion under 35 U.S.C. § 314(a) and deny institution in light of the district court litigation involving the ’489 Patent. Prelim. Resp. 21–30; Sur-Reply 1–5. Petitioner argues the opposite. Pet. 14–18; Reply 1–5.

In assessing whether to exercise such discretion, the Board weighs six non-exclusive factors, known as the *Fintiv* factors. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv I*”). Recognizing that “there is some overlap among these factors” and that “[s]ome facts may be relevant to more than one factor,” the Board “takes a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* We have considered Patent Owner’s arguments in light of the *Fintiv* factors, together with Petitioner’s opposition, and we decline to exercise our discretion to deny the Petition as explained further below.

1. Factor 1: Whether a Stay Exists or Is Likely to Be Granted if a Proceeding Is Instituted

The district court litigation has not been stayed, but Petitioner argues that it intends to seek a stay should the Board institute *inter partes* review.

Pet. 15; Reply 1–2. Patent Owner argues that the district court is unlikely to grant a stay. Prelim. Resp. 23; Sur-Reply 1–2.

There is no evidence that a stay has been requested in the district court litigation. We decline to speculate on how the district court would rule on a stay, if one were requested. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15 at 12 (PTAB May 13, 2020) (informative) (“*Fintiv IP*”) (explaining that factor 1 generally “does not weigh for or against discretionary denial” when neither party has requested a stay). Accordingly, this factor is neutral.

2. *Factor 2: Proximity of the Court’s Trial Date to the Board’s Projected Statutory Deadline*

The projected statutory deadline for this proceeding would be in May 2023. According to the parties, a jury trial in the district court litigation is scheduled to begin on May 3, 2023. Pet. 15; Prelim. Resp. 23; Ex. 1016 (Scheduling Order), 6. Petitioner argues that the case is likely to be transferred to a different division, and the current schedule is unlikely to be maintained in view of Patent Owner’s stated intention to pursue foreign discovery. Reply 2. Patent Owner argues that “Petitioners’ speculative arguments are contrary to the known *facts*” and the presiding judge is intent on keeping the district court case on track. Sur-Reply 2–3.

We typically take a district court’s trial schedule at “face value.” *Fintiv II* at 13. Accordingly, we assume that trial will begin in the district court litigation on May 3, 2023.

Given that trial is currently set to begin in the district court litigation around the same time as the projected statutory deadline for a final written decision, we determine that this factor is neutral.

3. *Factor 3: Investment in the Parallel Proceeding by the Court and Parties*

In the district court litigation, we understand that a *Markman* hearing was held on May 4, 2022, and fact discovery began on May 5, 2022. Ex. 1016, 4; *see also* Pet. 15–16; Prelim. Resp. 24–27 (discussing status of district court litigation). The parties have exchanged preliminary infringement and invalidity contentions (*see* Prelim. Resp. 24), and final contentions are due June 29, 2022. Ex. 1016, 4. Fact discovery closes November 30, 2022, and expert discovery closes January 25, 2023. *Id.* Although Patent Owner asserts that by the time of the institution decision, “a substantial portion of discovery in the parallel litigations will also be complete” (Prelim. Resp. 24), Petitioner argues that “the parties still face all of the burden associated with fact and expert discovery related to a validity challenge in district court.” Reply 4.

Although Patent Owner asserts that discovery has taken place related to Petitioner’s suppliers and motions to transfer venue (Prelim. Resp. 25), we determine that work on such ancillary discovery matters does not show substantial district court investment in the validity issues. *See Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 10 (PTAB June 16, 2020) (informative) (“[M]uch of the district court’s investment relates to ancillary matters untethered to the validity issue itself.”). We recognize that much work remains to be done in the district court litigation as it relates to invalidity: fact discovery is still ongoing, expert reports are not yet due, there have been no fact or expert depositions, and substantive motion practice is yet to come. *See* Ex. 1016. Thus, although the parties and the district court have invested

some effort in the district court litigation, the bulk of the work to prepare the invalidity case for trial is yet to be done.

We also acknowledge Petitioner’s diligence in filing the Petition “5 months before” the *Markman* hearing and “prior to serving preliminary invalidity contentions.” Pet. 16.

Under these circumstances, we determine that this factor weighs against exercising our discretion to deny institution.

4. *Factor 4: Overlap Between Issues Raised in the Petition and in the Parallel Proceeding*

Petitioner states that it “has challenged claims not asserted by [Patent Owner] in district court.” Pet. 16. Petitioner also

stipulates that, if the Board institutes *inter partes* review of this Petition, then Petitioner, and the Real Parties in Interest listed herein, will not assert in the WDTX Litigation that any of the Challenged Claims of the ’489 Patent is invalid on any ground involving the prior art relied upon in the grounds of invalidity herein.

Id. at 17. Petitioner argues that this stipulation is broader than the stipulation in *Sand Revolution*. Reply 5. Patent Owner argues that Petitioner’s stipulation is narrower than the statutory estoppel that attaches after a final written decision; and would have little, if any, impact on the district court litigation. Prelim. Resp. 28–29.

Concerns about the degree of overlap may be mitigated where a petitioner agrees not to pursue in the parallel district court litigation the grounds advanced in the petition. *Sand Revolution*, IPR2019-01393, Paper 24 at 11–12, 12 n.5. A petitioner stipulating not to pursue “any ground raised or that could have been reasonably raised” weighs strongly in favor of not exercising discretionary denial. *Sotera Wireless, Inc. v. Masimo*

Corp., IPR2020-01019, Paper 12 at 18–19 (PTAB Dec. 1, 2020) (precedential as to § II.A) (“*Sotera*”). Petitioner’s stipulation is not quite as broad as a *Sotera*-style stipulation, but it is more comprehensive than the stipulation in *Sand Revolution*. Specifically, whereas the petitioner in *Sand Revolution* agreed not to assert “the same grounds in the district court litigation” as asserted in the petition (*Sand Revolution*, IPR2019-01393, Paper 24 at 12), Petitioner here agrees that, if *inter partes* review is instituted, it will not assert in the district court litigation “any ground involving the prior art relied upon in the grounds of invalidity” in the Petition. Pet. 17. This stipulation mitigates to a large extent the concerns of inefficiency and the possibility of conflicting decisions with respect to the district court litigation. Thus, for all of the foregoing reasons, we determine that the fourth *Fintiv* factor weighs against discretionary denial of institution.

5. *Factor 5: Whether the Petitioner and the Defendant in the Parallel Proceeding Are the Same Party*

Under the circumstances here in which Petitioner is a defendant in the district court litigation and the trial in that case is currently set to occur around the same time as the issuance of a final written decision, this factor is neutral.

6. *Factor 6: Other Circumstances that Impact the Board’s Exercise of Discretion, Including the Merits*

Petitioner contends that the Petition “shows how the claims involve a combination of familiar elements, according to known methods, yielding predictable results, and provides good reasons for combining the routine teachings of the references.” Pet. 18; Reply 5. Patent Owner contends that the merits of Petitioner’s arguments are weak and this factor weighs in favor of discretionary denial. Prelim. Resp. 30.

As the Board explained in *Fintiv I*, we consider this factor as “part of a balanced assessment of all the relevant circumstances in the case.” *Fintiv I* at 14. The assessment requires consideration of the “strengths or weaknesses regarding the merits,” but this “is not to suggest that a full merits analysis is necessary to evaluate this factor.” *Id.* at 15–16.

We discuss the merits of this case below, finding Petitioner’s evidence and arguments are sufficient to meet our standard for instituting *inter partes* review, and, thus, we determine that this factor is neutral.

7. *Balancing the Fintiv Factors*

We have considered the circumstances and facts before us in view of the *Fintiv* factors. We take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Fintiv I* at 6. Having evaluated all of the factors, we determine that the circumstances presented here do not warrant exercising our discretion under § 314(a) to deny institution.

D. *Reasonable Likelihood under 35 U.S.C. § 314(a)*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that

the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when presented, objective evidence of nonobviousness, i.e., secondary considerations.⁹ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements,” but “must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

E. Asserted Obviousness

Petitioner argues that Gilliland and Vista would have rendered obvious claims 1, 4, 11, 12, 22, 25, 32, 33, 40–43, 46, 53, 54, 56, and 61–63. Pet. 20–56 (Ground 1). Petitioner also argues that Gilliland, Vista, and Jie would have rendered obvious claims 5, 6, 26, 27, 47, and 48 (*id.* at 56–63

⁹ At this stage, Patent Owner does not present any objective evidence of nonobviousness (i.e., secondary considerations) as to any of the challenged claims.

(Ground 2)), that Gilliland, Vista, and Peck would have rendered obvious claims 7–9, 28–30, and 49–51 (*id.* at 63–67 (Ground 3)), that Gilliland, Vista, Peck, and Cheng would have rendered obvious claims 10, 31, and 52 (*id.* at 67–74 (Ground 4)), that Gilliland, Vista, and Liao would have rendered obvious claims 39 and 58–60 (*id.* at 74–84 (Ground 5)), and that Gilliland, Vista, Liao, and Cheng would have rendered obvious claim 57 (*id.* at 84–90 (Ground 6)).

1. *Gilliland*

Gilliland is a US patent titled “Compact Contour Electrical Converter Package” and is directed to a “circuit assembly and package [that] incorporates a front cover with power contacting blades extending from a front surface thereof for electrical engagement in a receptacle.” Ex. 1005, codes (54), (57). Gilliland’s electrical converter package is used for, e.g., “[p]ower supplies for portable computers and chargers for cellular phones and battery packs.” *Id.* at 1:22–24. Figure 2, reproduced below, shows “an isometric view of a circuit assembly and packaging.” *Id.* at 2:1–2.

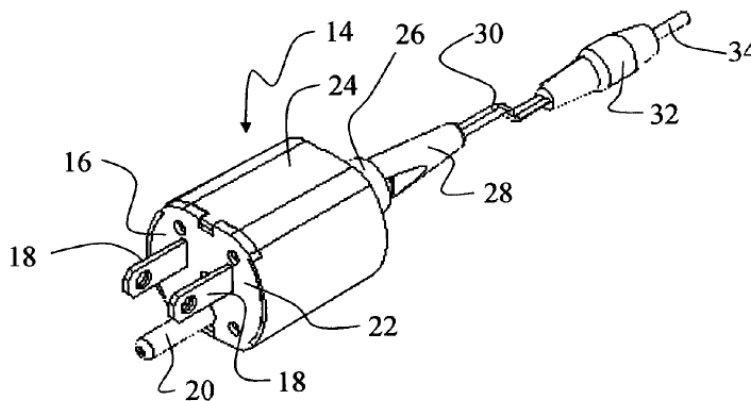


FIG. 2

As shown in Figure 2, the “unit includes body 14 having a front cover 16 with power connection blades 18 and a ground pin 20 extending from a front surface 22.” *Id.* at 2:53–56. Further, “tapered housing 24 engages and

extends from the front cover opposite the blades and houses the circuit elements of the unit.” *Id.* at 2:56–58. Still further, the “charger plug 32 having a standard male DC connector 34” is connected to the opposite end of the tapered housing. *Id.* at 2:62–66. Figure 3A is reproduced below.

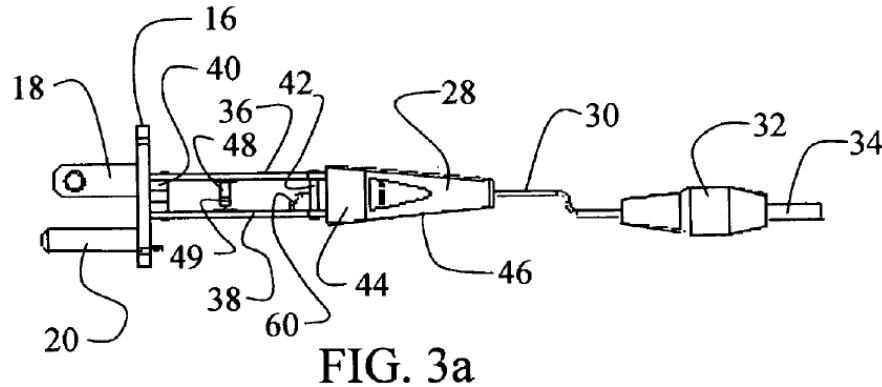
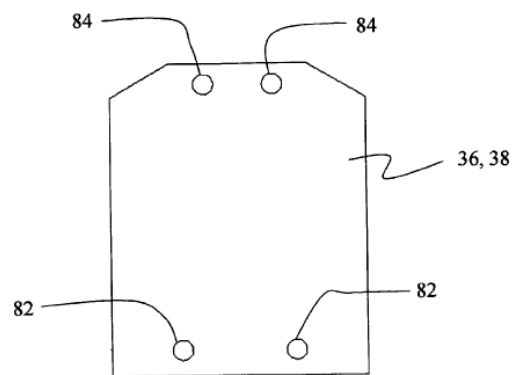
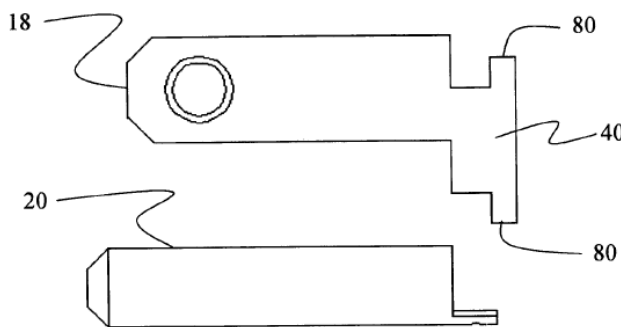


Figure 3A is a side view of the circuit assembly showing the internal arrangement of circuit elements. *Id.* at 2:3–5, 3:3–4. As shown in Figure 3A, “the circuit assembly is contained on two circuit boards, an upper circuit board 36 and lower circuit board 38. The power connection blades 18 incorporate a vertical arm 40 which engages and supports the circuit boards at a first end.” *Id.* at 3:5–9. Figures 7 and 8a are reproduced below.



Figures 7 and 8a show a side view of the geometry of a power connection blade (Figure 7) and a top view of an exemplary circuit board (Figure 8a), with which the blade engages. *Id.* at 2:20–23, 3:63–4:1. As shown in

Figure 7, “[v]ertical arms 40 on the blades terminate at both ends in rectangular posts 80 which engage the circuit boards” via the circuit boards’ “forward circular engagement holes 82 which receive the rectangular posts in an interference fit.” *Id.* at 3:64–4:1. In a “simplified method of manufacture,” the circuit boards are “mounted to pins 80 on the vertical arms of the power blades with front mounting holes 82 . . . and then soldered for electrical connection.” *Id.* at 8:21–23, 8:31–33.

Returning to Figure 3A, and focusing on mounting the circuit boards in the packaging, “[t]wo posts 42 support the circuit boards at a second end opposite the front cover.” *Id.* at 3:9–10. Additionally,

[i]nterconnection between the circuit boards is accomplished by a header 48 depending from the upper board which is received in a socket 49 mounted to the opposing surface of the lower board. The header and socket provide additional structural support and rigidity between the primary structural support attachments at the board ends.

Id. at 3:16–22. Furthermore, “the socket and header on the boards are mated and posts 42 are inserted in the rear mounting holes on the boards and soldered for structural support and rigidity at the rear of the multi-board assembly.” *Id.* at 8:33–37. Figure 10 is reproduced below.

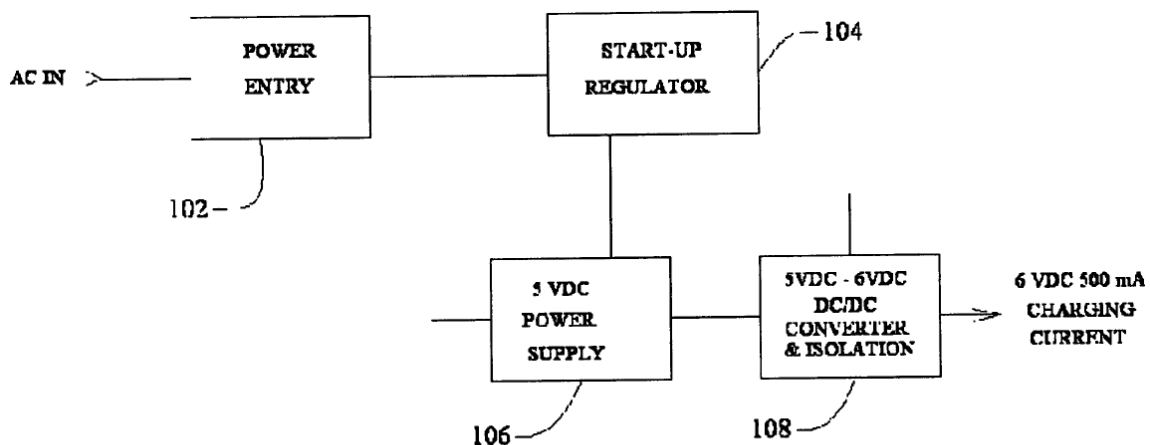


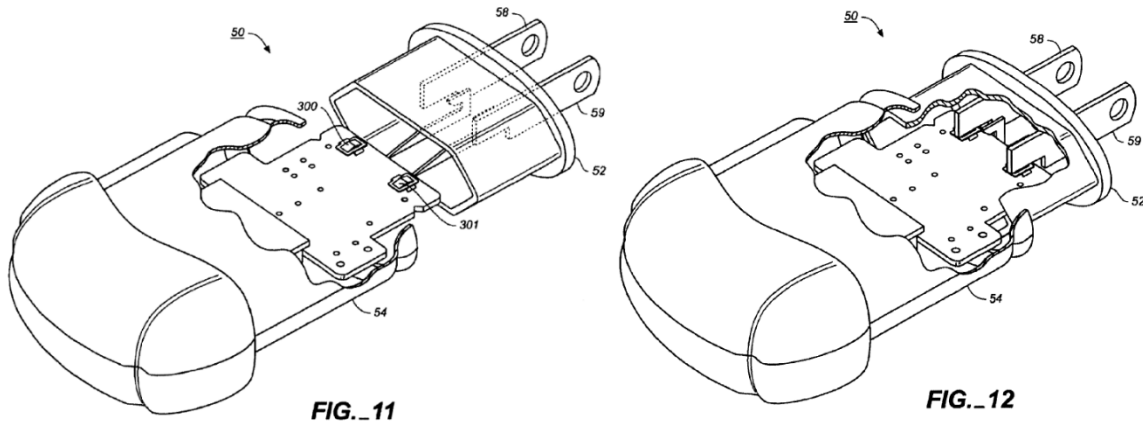
FIG. 10

Figure 10 is a block diagram of an exemplary charging circuit. *Id.* at 2:32–34. As shown in the charging circuit of Figure 10, “110V AC,” i.e., AC input, “is connected to a power entry circuit 102 which supplies a start-up regulator 104 and a 5 VDC power supply 106” so that, ultimately, “5VDC to 6VDC DC/DC converter and isolation circuit 108 . . . provides the desired charging current output.” *Id.* at 4:23–25, 4:31–33. In particular, “AC power from the power entry circuit 102 is also provided to a second diode bridge DB2 in the 5 VDC power supply” 106. *Id.* at 5:4–6; *see id.* Fig. 11A. The output from 5 VDC power supply 106 is received by 6VDC DC/DC converter 108; specifically, “6 VDC converter and isolation circuit receives the 5VDC power from the 5VDC power supply at pin 3 of the primary winding of transformer TR[1].” *Id.* at 6:16–18; *see id.* Fig. 11B. Connected to the secondary winding of transformer TR1, output rectifier diode SD2 “rectif[ies] the output signal, and capacitor bank C19a–j filters and levels the 6VDC output.” *Id.* at 6:43–45.

2. *Vista*

Vista is a US patent titled “Plug Assembly with Spring Loaded Contact Terminals” and is directed to a plug housing that “provides a mounting for AC prongs . . . and a PCB.” Ex. 1006, codes (54), (57). As background, *Vista* explains that “known means of providing electrical contact between the AC prongs and the circuit on a PCB to be powered by the AC power source is through the use of flexible wires, extended copper springs, or the direct soldering of the prongs to the PCB,” but the “use of such wires, springs, or direct soldering makes assembly more difficult than necessary.” *Id.* at 1:64–2:3. *Vista* states that its invention “eliminates the need to use flexible wires, springs, or direct soldering between the AC prongs and the circuitry on the PCB, thereby making assembly of the plug

assembly quicker and easier through use of a spring loaded contact terminal.” *Id.* at 2:55–61. Figures 11 and 12 are reproduced below.



Figures 11 and 12 are perspective views of an embodiment of Vista’s plug assembly having AC prongs conforming to U.S. plug standards. *Id.* at 3:43–50, 7:5–11. As shown in Figures 11 and 12, AC prongs 58, 59 engage with contact terminals 300, 301. *Id.* at 7:7–14. “Contact terminal 300, 301 provides a spring loaded contact to provide a secure electrical connection between . . . AC prongs 18, 19 and the first printed circuit board 36 that the contact terminals 300, 301 are mounted thereto.” *Id.* at 6:67–7:4. Figure 9 is reproduced below.

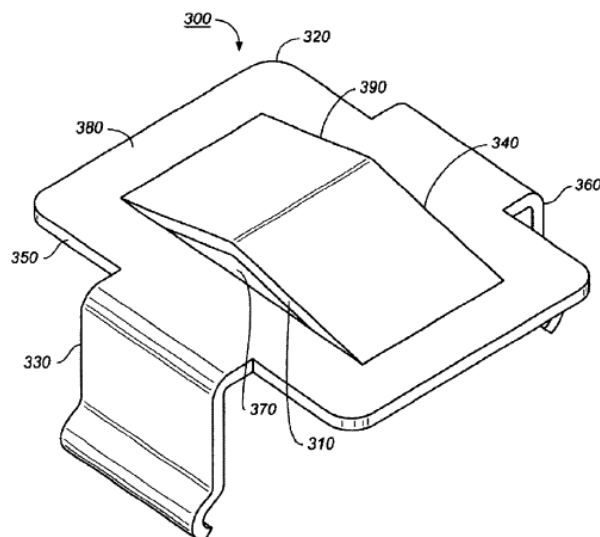


FIG. 9

Figure 9 is an isometric view of an exemplary contact terminal of the plug assembly. *Id.* at 3:38–39. As shown in Figure 9, contact terminals 300, 301 include first portion 350, second raised portion 340, and contact spring member 310. *Id.* at 6:34–35, 6:45–47. “First raised portion 390 and second raised portion 340 are flexibly coupled at a junction point. The orientation of the first raised portion 390 and a second raised portion 340 for use in the plug assembly 30 are best seen in FIG. 7.” *Id.* at 6:55–59, Fig. 7. In “an exemplary assembly, a corresponding one of the AC prongs 18, 19 initially slidably engages the first raised portion 390 which flexibly contacts the corresponding prong.” *Id.* at 6:60–63. As such, the tips of the AC prongs are “flexibly and securely contacted by the corresponding contact terminal 300, 301 through a spring action provided by the flexible contact spring member 310 of contact terminal 300, 301.” *Id.* at 6:63–67.

3. *Jie*

Jie is a Chinese patent application publication titled “A New Plug-in Power Supply Device” and is directed to “a plug-in device with a built-in switch-mode power supply device.” Ex. 1007, codes (54), (57). *Jie*’s power supply transforms AC voltage into DC voltage and, further, filters that transformed voltage “to output high-quality DC voltage.” *Id.* at 58:18. Filtering is provided via, e.g., “a π -type filter,” a “fil[t]er composed of [capacitor] C1, [inductor] L1, and [capacitor] C2 to produce the DC voltage of small rippling,” “a filter network composed of [capacitor] C6, [inductor] L2, [capacitor] C7 and [capacitor] C9.” *Id.* at 48:24–25, 58:19, Fig. 5.

4. *Peck*

Peck is a US patent publication titled “Planar Transformer Comprising Plug-In Secondary Windings” and is directed to a printed circuit board having “a planar transformer comprising a ferrite core.” Ex. 1008,

codes (54), (57). Peck explains that using such a configuration with a planar transformer provides certain advantages, such as “the distance between the primary and secondary coil(s) can never be less than the distance required” and “it is possible to dispense entirely with printed circuit cards within the planar transformer.” *Id.* ¶ 24. Further, Peck states that its “planar transformer . . . can then be placed onto a printed circuit board . . . and soldered on it.” *Id.* ¶ 44.

5. *Cheng*

Cheng is a US patent titled “Miniaturizing Power Supply System for Portable Computers by Improving Heat Dissipation Therein” and is directed to a “power supply for providing power from an external power source to a portable electronic device” and “includes electronic circuits including an AC-to-DC converter.” Ex. 1009, codes (54), (57). Cheng explains that its “system further includes an inner enclosure for enclosing and protecting the electronic circuits supported on the printed circuit board wherein the inner enclosure [is] composed of heat conductive materials.” *Id.* at code (57). Further, “heat generated from the electronic circuits 125 supported on the PCB 130” is “dissipated by a heat conduction process through the conductive inner enclosure 120” and “further transferred by a heat convection process through the airflow to be released into the external environment.” *Id.* at 4:14–24. The inner enclosure may be “metallic” and, as such, “further function[s] as a shield to protect the electronic circuits 125 from electrical magnetic interference (EMI).” *Id.* at 4:26–29.

6. *Liao*

Liao is a US patent publication titled “Universal Serial Bus Voltage Transformer” and is directed to “a universal serial bus (USB) voltage transformer, which comprises a main body, a transformer circuit unit, and

several connectors” which “are electrically connected to the transformer circuit unit directly or via a connection cable.” Ex. 1010, codes (54), (57). In one embodiment, a voltage transformer includes a transformer circuit and has a variety of connectors, such as A-type, B-type, and mini-type USB connectors, coupled to the transformer circuit’s output. *Id.* ¶¶ 20–22, Fig. 2. The transformer may “directly plug with [a] portable electronic device 60 like a mobile phone” via USB connectors. *Id.* ¶ 25, Fig. 6.

7. *Petitioner’s Arguments*

Petitioner asserts that every element of claim 1 is found in the combination of Gilliland and Vista, as follows:

1[pre] *A power supply adapter comprising:* (Pet 29–30 (relying on Ex. 1004 ¶¶ 104–105; Ex. 1005, 1:6–10, 1:45–57, 2:1–9, 2:32–34, 4:20–37, 7:28–33, code (57), Figs. 2, 4, 10));¹⁰

1[a] *a power converter circuit configured to generate a regulated voltage signal, the power converter circuit including,* (Pet 31–32 (relying on Ex. 1004 ¶¶ 106–109; Ex. 1005, 4:20–37, 4:42–65, 5:4–20, 6:16–30, 6:43–7:25, 9:46–48, Figs. 10–11B));

1[b] *a rectifier coupled with AC power blades;* (Pet 32–34 (relying on Ex. 1004 ¶¶ 111–113; Ex. 1005, 2:54–55, 3:63–4:3, 4:42–51, 4:59–65, 5:4–10, 7:40–8:20, 10:55–59, Figs. 7, 8A, 11A; Ex. 1006, 6:67–7:4, 8:19–48, Figs. 11–12; Ex. 1012, 38–41));

1[c] *a regulator circuit coupled with the rectifier;* (Pet 34–36 (relying on Ex. 1004 ¶¶ 114–117; Ex. 1005, 4:23–29, 4:31–33, 4:54–56, 4:60–65, 5:4–6:3, 6:16–42, 7:3–25, Figs. 10, 11A));

¹⁰ We express no opinion on whether the preamble is limiting.

1[d] *a transformer coupled with the regulator circuit, the transformer including a primary and a secondary, the transformer being coupled with the regulator circuit via the primary;* (Pet 36–38 (relying on Ex. 1004 ¶¶ 119–124; Ex. 1005, 6:16–30, 7:14–19, Figs. 10–11B, claims 60, 62));

1[e] *an output circuit coupled with the secondary of the transformer, the output circuit including an output capacitor; and* (Pet 39 (relying on Ex. 1004 ¶ 126; Ex. 1005, 6:43–46, 7:40–8:20, Fig. 11B));

1[f] *a flexible contact coupled with each of a first and a second printed circuit board and flexibly biased to couple with a proximate end of the AC power blades.* Pet 40–44 (relying on Ex. 1004 ¶¶ 128–133; Ex. 1005, 1:48–53, 3:3–23, 3:61–4:1, 8:20–33, Figs. 3A, 4, 5A, 6B, 7–8B; Ex. 1006, 3:43–50, 6:33–59, 7:5–14, 7:33–36, 8:19–41, code (57), Figs. 9, 11, 12, claim 3).

Petitioner argues that Gilliland discloses all of the subject matter of claim 1 except for the “flexible contact” and “flexibly biased” aspects of recitation 1[f]. Pet. 29–44. Petitioner asserts that a person of ordinary skill in the art “would have been motivated to modify *Gilliland*’s power adapter to incorporate *Vista*’s spring-loaded contact terminals.” Pet. 20–28. More particularly, Petitioner argues that *Vista* “teaches the spring-loaded contact terminal ‘eliminates the need to use . . . direct soldering’ such as in *Gilliland*, “thereby making the assembly of the plug assembly quicker and easier.” *Id.* at 22–23. One of ordinary skill in the art, therefore, “would have been motivated to replace the circular engagement holes 82 on circuit boards 36 and 38 in *Gilliland*’s power converter circuit with *Vista*’s contact terminals 300 and 301,” with a reasonable expectation of success. *Id.* at 23 (citing Ex. 1004 ¶ 91), 26 (citing Ex. 1004 ¶ 95). For certain claims reciting “non-metallic,” Petitioner also argues that one of ordinary skill in the art

“would have been motivated to mold *Gilliland*’s power supply enclosure using non-conductive material, like plastic, as taught by *Vista*,” with a reasonable expectation of success. Pet. 28–29 (citing Ex. 1004 ¶ 100).

8. *Patent Owner’s Arguments*

First, Patent Owner argues that *Vista* does not teach “a flexible contact coupled with each of a first and a second printed circuit board and flexibly biased to couple with a proximate end of the AC power blades,” as similarly recited in independent claims 1, 22, and 43. Prelim. Resp. 12–16. Patent Owner argues that the “alternate contact terminal” embodiment shown in Figure 9 of *Vista*, as well as other figures, does not comprise a flexible material, but only that “first raised portion 390 and second raised portion 340 are flexibly coupled at a junction point.” *Id.* at 13–14 (citing Pet. 43; Ex. 1006, 6:55–56). Patent Owner also argues that *Vista* does not teach “that its contact is ‘flexibly biased to couple with a proximate end of the AC power blades’ as claimed.” *Id.* at 15. Rather, Patent Owner argues, the ’489 patent contact is “flexible in multiple orientations” whereas *Vista*’s contact “has a fixed orientation based on the junction.” *Id.* at 15–16.

Second, Patent Owner argues that Petitioner improperly combined *Gilliland* and *Vista*. Prelim. Resp. 16–18. More particularly, Patent Owner argues that “*Gilliland* repeatedly emphasizes the benefits of using rigid elements, rigid soldering, and rigid encapsulation,” and that one of ordinary skill in the art would have appreciated “that a flexible contact, such as allegedly described by *Vista*, is the exact opposite of the rigid connection between the power blade and PCB as called for by *Gilliland*.” *Id.* at 17.

Third, Patent Owner argues that the “Petition does not comply with Section 42.104(b)(4)’s requirement to ‘specify where each element of the claim is found in the prior art’ because it does not explain how the prior art

discloses a flexible contact ‘*flexibly biased* to couple with a proximate end of the AC power blades.’” *Id.* at 19–21.

9. *Analysis*

As to Patent Owner’s first argument, the language of the claims requires a “flexible contact” that is “flexibly biased”; the language of the claims does not require a “flexible material,” as Patent Owner appears to argue. Patent Owner does not present argument or any case law that any element that may be present in the specification must be read into claims where it is not recited. Additionally, without a formal claim construction proposal other than a suggestion that we give every term its plain and ordinary meaning (Pet. 14; Prelim. Resp. 11), we do not give any express construction to the claim terms “flexible contact” or “flexibly biased.” To meet the “flexible contact” and “flexibly biased” limitations, Petitioner points to Vista’s contact terminals 300 and 301, which provide spring-loaded electrical contact with AC power blades. Pet. 22–23. Petitioner’s declarant Dr. Elenius supports Petitioner’s contentions that Vista discloses a “flexible contact” that is “flexibly biased.” *Id.* at 22–26 (citing Ex. 1004 ¶¶ 88–94). To the extent that Patent Owner argues that Vista’s contacts are not “flexible,” Patent Owner presents only attorney argument on this issue. Prelim. Resp. 15–16. Patent Owner and Petitioner are encouraged to develop the claim construction of “flexible contacts” or “flexibly biased” at trial, if needed.

As to Patent Owner’s second argument, Patent Owner appears to assert that Gilliland’s “rigid” structure teaches away from a combination with Vista’s disclosure, which is concerned with alleged “flexible contacts.” Prelim. Resp. 16–18. At this stage in the proceeding, we do not perceive a teaching away in Gilliland or Vista that would lead one of ordinary skill in

the art away from combining Gilliland’s teachings with Vista’s teachings. Patent Owner points to nothing in Gilliland that makes rigidity an absolute requirement, or that disparages flexibility. *Id.*; see *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (disclosing a different solution to a similar problem in a prior art reference does not teach away from the claimed subject matter unless the prior art reference also criticizes, discredits or otherwise discourages the solution claimed). A reference that “merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into” the claimed invention does not teach away. *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013). Moreover, Vista expressly notes that use of “direct soldering makes assembly more difficult than necessary,” leading to its plug assembly that is “quicker and easier though use of a spring loaded contact terminal,” which Petitioner references in support of its reasoning to combine the references. Ex. 1006, 2:1–3, 2:50–63; Pet. 22–23. On this record, Petitioner presents a sufficient rationale for combining the teachings of Gilliland and Vista and sufficient evidentiary support for that rationale. Pet. 20–28; Ex. 1004 ¶¶ 88–94.

As to Patent Owner’s third argument, that Petitioner does not explain how the prior art discloses a flexible contact “flexibly biased to couple with a proximate end of the AC power blades,” the Board’s rules require that a petition for *inter partes* review “must specify where each element of the claim is found in the prior art patents or printed publications relied upon.” 37 C.F.R. § 42.104(b)(4). We have reviewed the Petition, the declaration, and the evidence, and find these materials contain adequate support for Petitioner’s assertions that the combinations of Gilliland and Vista, together with the other secondary references, are reasonably likely to teach the

limitations of the challenged claims. Pet. 20–90. Specifically, on this record, Petitioner sufficiently identifies where it believes each limitation of the challenged claim is found in those references or combination of references, including the “flexibly biased” limitation. Pet. 42–44 (citing Ex. 1004 ¶¶ 131–133).

We have reviewed Petitioner’s contentions with respect to all challenged claims in all grounds asserted and determine that the Petition provides the requisite showing, at this stage of the proceeding, that the subject matter of these claims would have been obvious over the asserted references. Other than the arguments addressed above, Patent Owner does not offer, at this stage, any arguments addressing Petitioner’s substantive showing. On this record, therefore, Petitioner demonstrates a reasonable likelihood of prevailing on its arguments that the challenged claims would have been obvious over the Grounds 1–6 combinations of prior art.

III. CONCLUSION

For the reasons set forth above, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one challenged claim of the ’489 patent, and we institute *inter partes* review on all challenged claims and on all grounds presented.

At this preliminary stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim or any factual or legal issue underlying the patentability inquiry. Any final determination will be based on the record developed during trial. We place Patent Owner on express notice that any argument not asserted in a timely-filed Response to the Petition, or in another manner permitted during trial, shall be deemed waived, even if that argument was presented in the Preliminary Response.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review is instituted on each of the grounds asserted in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which shall commence on the entry date of this decision.

IPR2022-00308
Patent 7,978,489 B1

FOR PETITIONER:

Eliot Williams
Neil Sirota
Brett Thompson
Bryan Parrish
BAKER BOTTS L.L.P.
Eliot.williams@bakerbotts.com
Neil.serota@bakerbotts.com
Brett.thompson@bakerbotts.com
Bryan.parrish@bakerbotts.com

FOR PATENT OWNER:

James T. Carmichael
Stephen McBride
Minghui Yang
CARMICHAEL IP, PLLC
jim@mcarmichaelip.com
stevemcbride@carmichaelip.com
mitch@carmichaelip.com