

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD.,  
Petitioner,

v.

MYPAQ HOLDINGS LTD.,  
Patent Owner.

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IPR2022-00308  
Patent 7,978,489 B1

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

KALAN, *Administrative Patent Judge*.

JUDGMENT  
Final Written Decision  
Determining All Challenged Claims Unpatentable  
*35 U.S.C. § 318(a)*

## 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. Pursuant to Board authorization, Petitioner filed a Reply to the Patent Owner Preliminary Response. Paper 9. Patent Owner filed a Sur-Reply to Petitioner’s Reply. Paper 10.

We instituted *inter partes* review of claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 of the ’489 patent on the grounds of unpatentability alleged in the Petition. Paper 11 (“Dec.”). After institution of trial, Patent Owner filed a Patent Owner Response. Paper 16 (“PO Resp.”). Petitioner filed a Reply. Paper 19 (“Reply”). Patent Owner filed a Sur-Reply. Paper 20 (“Sur-Reply”). We held an oral hearing on February 23, 2023, and a transcript of the hearing is included in the record. Paper 25 (“Tr.”).

This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 are unpatentable.

### 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).

The parties also state that Petitioner has filed petitions regarding other patents held by Patent Owner: IPR2022-00307 regarding U.S. Pat.

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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, LLC 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 includes a rectifier coupled with 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.

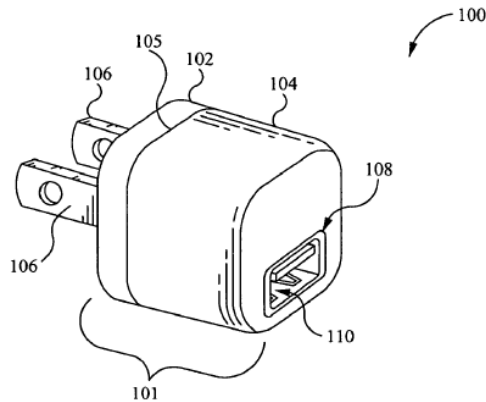


**Fig. 1A**

Figure 1A is a perspective view of a power supply adapter, showing power supply 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 2:18–19, 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 is reproduced below.

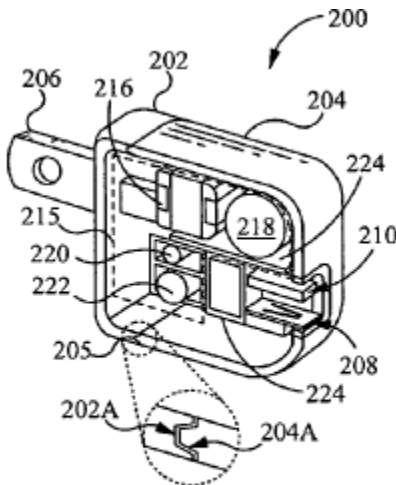
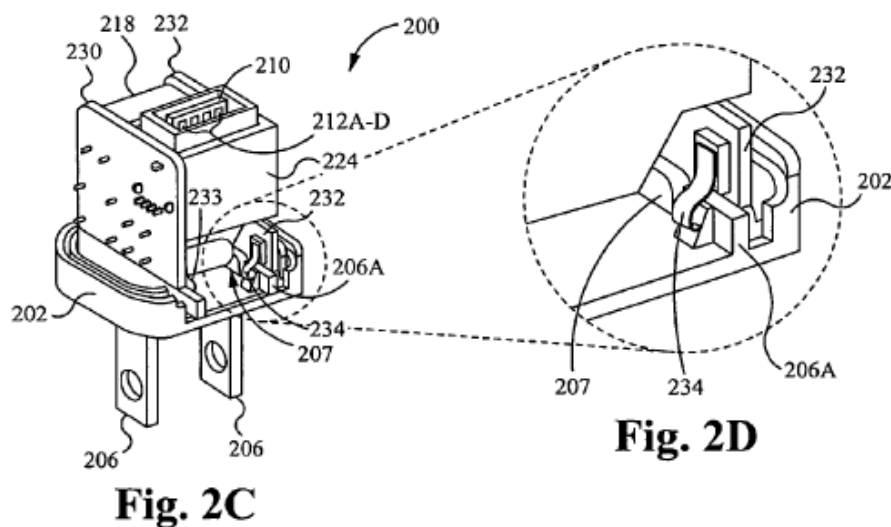


**Fig. 2B**

Figure 2B 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. 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. Power converter circuit 215 is housed in the power supply adapter enclosure via first and second printed circuit boards (PCBs) 230, 232 (not shown in Figure 2B; *see* Figure 2C, below). *Id.* at 4:3–7. First and second PCBs 230, 232 “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. In Figure 2C, 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.” *Id.* at 5:8–11. “The 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 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*

Claims 1, 22, and 43 of the '489 patent are independent. 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. Instituted Grounds of Unpatentability*

We instituted *inter partes* review of claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 of the '489 patent on the following grounds:

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

In support of its unpatentability arguments, Petitioner relies on the declarations of Dr. Sayfe Kiaei. Ex. 1004; Ex 1026. Patent Owner relies on

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<sup>1</sup> 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.

<sup>2</sup> US 7,101,226 B1, issued September 5, 2006 (Ex. 1005).

<sup>3</sup> US 6,644,984 B2, issued November 11, 2003 (Ex. 1006).

<sup>4</sup> 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.

<sup>5</sup> US 2004/0257190 A1, published December 23, 2004 (Ex. 1008).

<sup>6</sup> US 6,081,425, issued June 27, 2000 (Ex. 1009).

<sup>7</sup> US 2003/0151938 A1, published August 14, 2003 (Ex. 1010).

the declaration of Dr. Frank Ferrese to support its opposition. Ex. 2019. The parties also rely on the deposition transcripts of Dr. Kiaei (Ex. 2021) and Dr. Ferrese (Ex. 1027).

## II. ANALYSIS

### A. *Legal Standards*

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of nonobviousness, i.e., secondary considerations.<sup>8</sup> *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). A decision on the ground of obviousness must include “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The obviousness analysis “should be made explicit” and it “can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 550 U.S. at 418.

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent

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<sup>8</sup> Neither Patent Owner nor Petitioner appear to present any evidence directed to secondary considerations. *See* Pet.; PO Resp.; Reply; Sur-Reply.

Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Petitioner must demonstrate unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d); *see also Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)).

*B. Level of Ordinary Skill in the Art*

In our Institution Decision, we adopted Petitioner’s undisputed contention 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)), with the exception of the open-ended phrase “at least,” which expands the range of experience indefinitely without an upper bound. Dec. 8–9.

Patent Owner contends that it “does not dispute part (ii) of the Petition’s definition is sufficient for a POSITA, however for part (i), a Master of Science in Mechanical Engineering alone would not necessarily focus enough on power electronics to qualify as a POSITA.” PO Resp. 14 (citing Ex. 2019 ¶¶ 37–38).

In its Reply, Petitioner agrees with using “the vantage point of a person with some expertise in the design and/or packaging of power

electronics (through work or otherwise) in addition to either a Bachelor's or Master's degree in a relevant field.” Reply 3.

Patent Owner, in its Sur-Reply, notes Petitioner's agreement that “a POSITA should have expertise in power electronics design or packaging” and argues that the definition should incorporate “the requisite expertise in power electronics design or packaging.” Sur-Reply 4.

We are reluctant to use the parties' formulation requiring “expertise” in power electronics because it could be read to include an expert level of skill rather than an ordinary level of skill. Accordingly, we modify the definition set forth in the Institution Decision, so 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, and experience in the design and/or packaging of power electronics, or (ii) a Bachelor of Science in Electrical Engineering, Mechanical Engineering or a related field as well as two years of experience in the design and/or packaging of power electronics. We further note that the prior art itself demonstrates the level of skill in the art at the time of the invention. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that “specific findings on the level of skill in the art . . . [are not required] ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown’” (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

### *C. Claim Construction*

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b). 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 only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner originally stated that it “has applied the plain and ordinary meaning of the claims herein,” without proposing any express constructions. Pet. 14.

Patent Owner proposes that the term “flexibly biased” be construed as “comprising a material that is flexible such that a force is exerted on contact.” PO Resp. 12. Patent Owner argues that Petitioner’s expert agreed in deposition that the “material is flexible as well as it has certain amount of bias in it.” *Id.* at 12–13 (quoting Ex. 2021, 31:10–19) (emphasis omitted). Patent Owner further argues that the ’489 patent itself “affirms that the flexible contact is flexibly biased because the flexible material creates a bias when contacting the AC power blades to securely couple the PCB to the AC power blades.” *Id.* at 13 (citing Ex. 1001, 5:4–15, 8:35–45, 11:34–47). Because of the presence of the phrase “flexible contact” in the challenged claims, Patent Owner argues that, to give effect to every word in the claims, “‘flexibly biased’ must mean something more than simply that the contact is flexible.” *Id.* at 13–14.

Petitioner proposes that the term “flexibly biased” means “exerting a force when deformed (or flexed).” Reply 4. Petitioner relies on intrinsic and extrinsic evidence to support that “flexible” or “flexibly” refers to the “degree of movement (deformation) due to an external force” and that “bias”

is “the force exerted by the flexible contact against the proximate end of an AC power blade.” *Id.* at 4–6 (citing Ex. 1026 ¶¶ 11–15; Ex. 1001, 5:4–15, 8:35–45, 11:33–47; Ex. 1028, 61; Ex. 1029, 231; Ex. 1030, 91). Petitioner’s expert testifies that there is “no reason to include Patent Owner’s ‘comprising a material’ language in the construction of ‘flexibly biased.’” Ex. 1026 ¶ 16 (cited in Reply 8). In sum, Petitioner proposes that “flexibly biased” means “exerting a force when deformed (or flexed),” such that a flexible contact “flexibly biased to couple with a proximate end of the AC power blades” means “when deformed, the contact exerts a force against the proximate end of the AC power blade to aid in coupl[ing] the contact to the blade.” Reply 8.

Patent Owner disagrees, maintaining that the term “flexibly biased” “must have more meaning than simply reaffirming that the contact is flexible.” Sur-Reply 1. Patent Owner also asserts that both experts “agreed that the claim term ‘flexibly biased’ means comprising ‘the material is flexible’ such that a force is exerted on contact” and Petitioner fails to explain “why its shifting constructions are necessary.” *Id.* at 3. Patent Owner maintains that “flexibly biased” means “comprising a material that is flexible such that a force is exerted on contact.” *Id.*

We adopt the construction of “flexibly biased” as “exerting a force when deformed (or flexed).” In our view, the portion of Patent Owner’s proposed construction requiring “comprising a material” is not necessary to the construction of the phrase “flexibly biased.”

Our analysis begins with the claim language. The grammatical nature of the phrase “flexibly biased” within the entire limitation supports construing the phrase without reference to the material that comprises the

contact. The claim recites a contact that *is* “flexibly biased,” so “flexibly biased” is an adjective/adverb combination describing not what the contact is, but how it performs.

We next consider the specification. Claim terms of a patent will not be read restrictively “unless the patentee has demonstrated a clear intention to limit the claim scope using ‘words or expressions of manifest exclusion or restriction.’” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (*quoting Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1327 (Fed. Cir. 2002)). Patent Owner asserts that the ’489 patent “affirms that the flexible contact is flexibly biased because the flexible material creates a bias when contacting the AC power blades to securely couple the PCB to the AC power blades.” PO Resp. 13 (citing Ex. 1001, 5:4–15, 8:35–45, 11:34–47). We disagree. Patent Owner’s reliance on the ’489 patent’s disclosure that the contacts “comprise a suitable flexible, durable and conductive material” (Ex. 1001, 5:12–13, 8:43, 11:44–45) does not require us to import any “material” limitations into our construction of “flexibly biased.” Rather, the specification discusses the “flexibly biased” property in connection with the ability to “couple” or “securely couple” “with a proximate end of the AC power blades” or “with contact pads.” Ex. 1001, 1:45–47, 5:6–8, 8:37–39, 11:37–39. The construction “exerting a force when deformed (or flexed)” accounts for the specification’s discussion of the term “flexibly biased” and does not impose unnecessary narrowing restrictions on the term. *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“[A] particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.”). We note that Patent Owner’s expert

appeared to agree that the “comprising a material” portion of Patent Owner’s proposed definition is not critical for the construction of “flexibly biased.” Ex. 1027, 42:8–43:2 (Q. “Would it be wrong to delete the words ‘comprising a material that is’ from [Patent Owner’s proposed] construction of the term ‘flexibly biased’? A. . . . So could we perhaps say that flexibly biased could just be the second part of that definition? Perhaps. . . .”).

We also consider the extrinsic evidence. Although Petitioner’s expert testified at deposition that “flexibly biased” means that “the material is flexible as well as it has certain amount of bias in it, meaning that it has certain amount of force in it which is able to make contact” (Ex. 2021, 31:10–19), he clarified his opinion in a subsequent declaration. Ex. 1026 ¶ 16. We are persuaded by Dr. Kiaei’s testimony that there is “no reason to include Patent Owner’s ‘comprising a material’ language in the construction of ‘flexibly biased.’” *Id.*

Thus, based on the evidence as a whole, we construe “flexibly biased” as “exerting a force when deformed (or flexed).”

*D. Summary of Certain Asserted Art*

*1. Gilliland*

Gilliland is 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 is reproduced below.

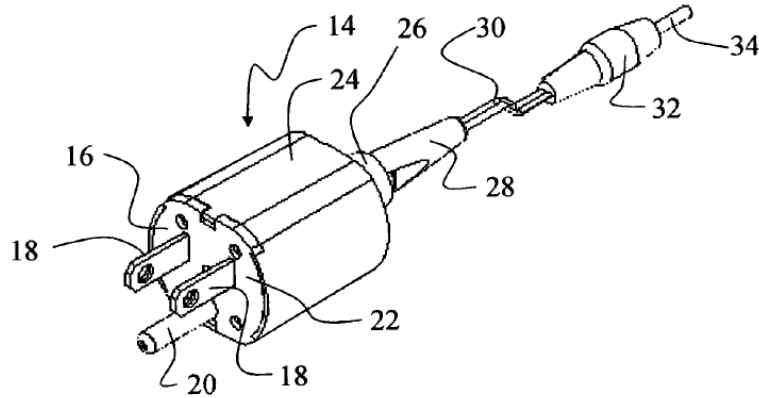


FIG. 2

Figure 2 shows “an isometric view of a circuit assembly and packaging.” *Id.* at 2:1–2. 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 attached to the connection cord.” *Id.* at 2:62–66. Figure 3A is reproduced below.

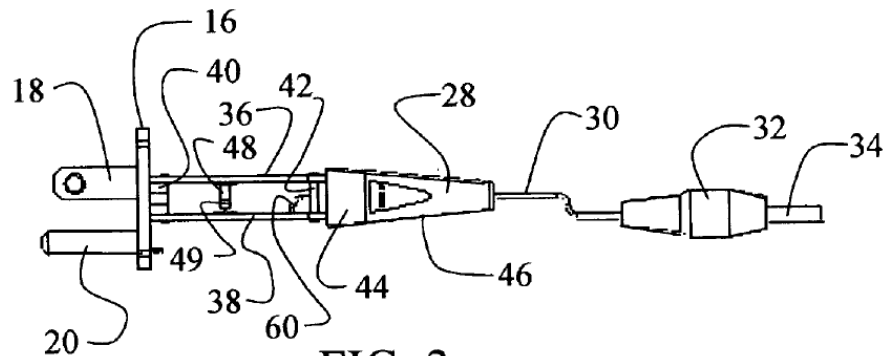


FIG. 3a

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.

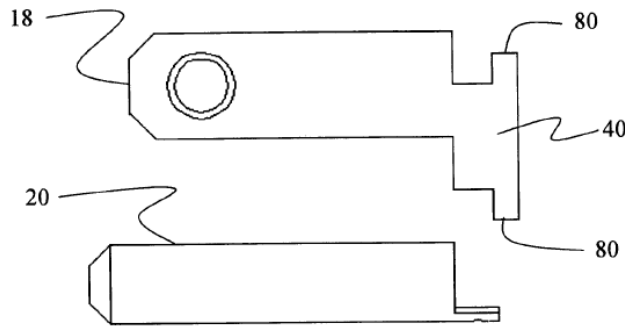


FIG. 7

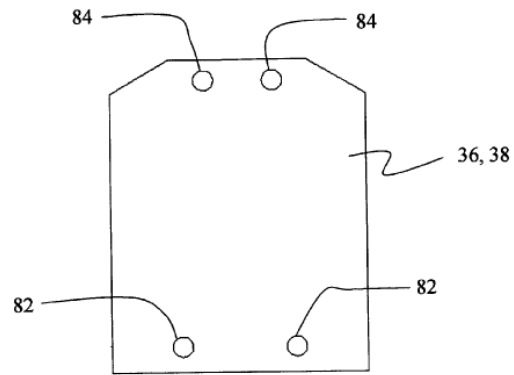


FIG. 8a

Figures 7 shows a side view of the connection blade configuration, and Figure 8a shows a top view of an exemplary circuit board, 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, interconnection 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.

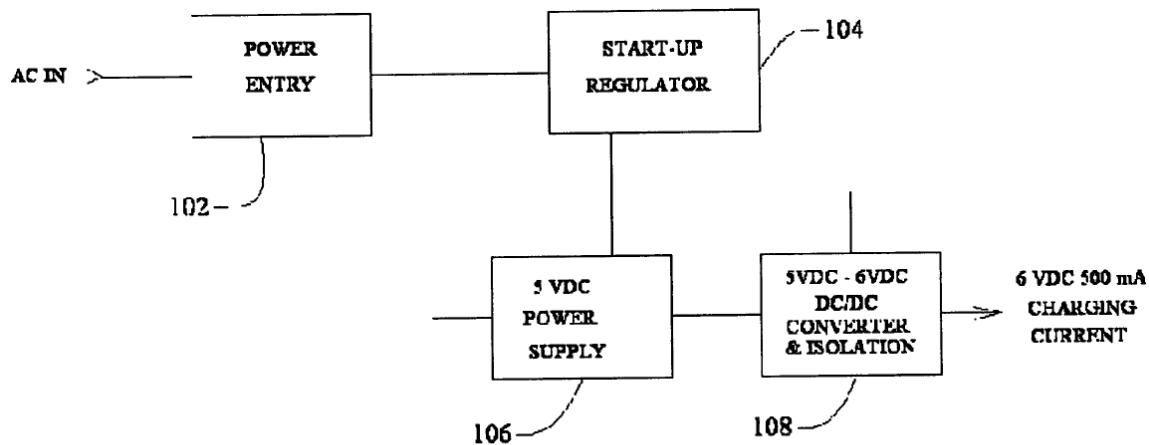


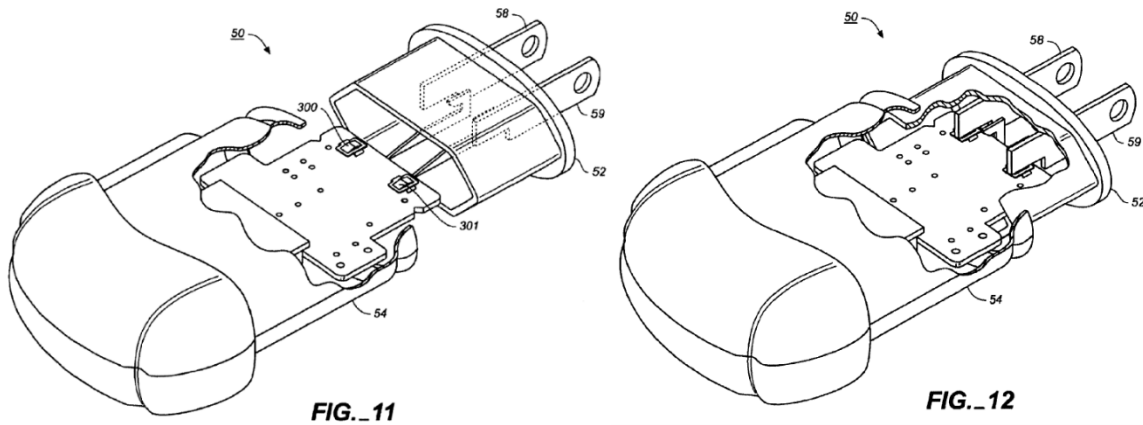
**FIG. 10**

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, a “5VDC to 6VDC DC/DC converter and isolation circuit 108 is powered by the 5VDC power supply and 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. Output rectifier diode SD2 “is connected to the secondary winding to rectify the output signal, and capacitor bank C 19a–j filters and levels the 6VDC output.” *Id.* at 6:43–45.

## 2. *Vista*

*Vista* is titled “Plug Assembly with Spring Loaded Contact Terminals” and is directed to a “plug housing that provides a mounting for AC prongs that creates a cavity therewithin, and a PCB located in the cavity.” 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.

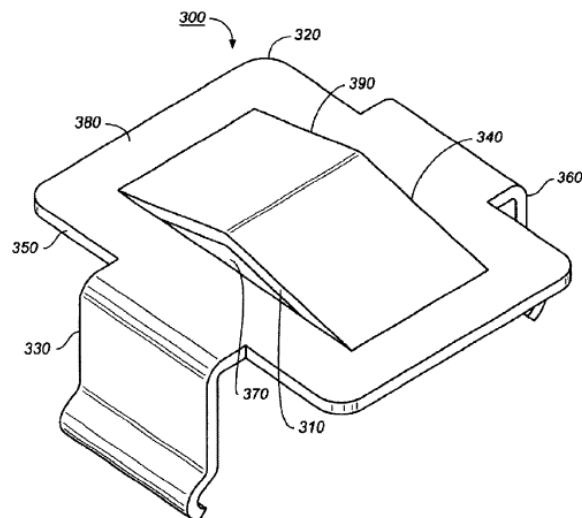


**FIG. 9**

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 and contact spring member 310 having first raised portion 390 and second raised portion 340. *Id.* at 6:34–35, 6:45–47. “First raised portion 390 and second raised portion 340 are flexibly coupled at a junction point.” *Id.* at 6:55–59. 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.

*E. Petitioner’s Arguments*

Petitioner asserts that every element of claim 1 is found in the combination of Gilliland and Vista, as set forth in the Petition 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));<sup>9</sup>

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));

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<sup>9</sup> We express no opinion on whether the preamble is limiting.

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));

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.” *Id.* at 20–28 (citing Ex. 1004 ¶ 85). 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 (emphasis omitted; quoting Ex. 1006, 2:50–63). One of ordinary skill in the art, Petitioner argues,

“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” materials, 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. *Id.* at 28–29 (citing Ex. 1004 ¶ 100). Regarding the “flexible contact” and “flexibly biased” aspects of recitation 1[f], Petitioner relies on *Vista*’s disclosure of a “pair of contact terminals” 300 and 301 coupled to a PCB to create the spring-loaded electrical contact with the AC power blades. *Id.* at 42–44. More particularly, Petitioner relies on *Vista*’s contact spring member 310, which “includes a first raised portion 390” and “second raised portion 340” that are “flexibly coupled at a junction point,” arguing that the *Gilliland-Vista* combination’s “AC power blades 80 would make electrical contact with the spring-loaded contact terminals on both of *Gilliland*’s circuit boards to provide the input AC power to the converter circuit.” *Id.* at 43–44 (quoting Ex. 1006, 6:55–56; citing Ex. 1005, Figs. 6b, 8a–b; Ex. 1006, Fig. 11).

All of Petitioner’s challenges are founded, at least in part, on this *Gilliland-Vista* combination. *Id.* at 13–14. Petitioner presents additional arguments and evidence to support its assertions that the remaining claims challenged would have been obvious over the proposed combinations of prior art. *Id.* at 44–90. Patent Owner’s arguments focus on two limitations: the “flexibly biased” limitation of independent claims 1, 22, and 43, and the “potting material” limitation of claims 42 and 63. *See* PO Resp. 16–22.

Apart from these two arguments, which we discuss in more detail below, Patent Owner does not dispute other aspects of Petitioner’s challenges to claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63.

*F. Parties’ Arguments – Flexibly Biased*

Patent Owner argues that the prior art combinations do not disclose or suggest a “flexible contact . . . flexibly biased to couple with a proximate end of the AC power blades” as recited in independent claims 1, 22, and 43. PO Resp. 16. Patent Owner relies on its proposed construction of “flexibly biased” as “comprising a material that is flexible such that a force is exerted on contact” to argue that “Vista’s contact is not ‘flexibly *biased*’” because “Vista does not describe the material of the contact is flexible.” *Id.* Patent Owner again relies on Dr. Kiaei’s deposition testimony that “the material is flexible” to argue that Patent Owner’s construction is proper. *Id.* at 17 (quoting Ex. 2021, 31:10–19). Patent Owner also again refers to the ’489 patent’s disclosure that the “contacts comprise a suitable flexible, durable, and conductive material. In an exemplary embodiment, the spring contacts comprise a metallic material of appropriate thickness.” *Id.* (quoting Ex. 1001, 5:11–15). Patent Owner argues that Vista also does not disclose a “flexibly biased” contact because it “lacks any disclosure that the material of Fig. 9’s contact is flexible such that a force is exerted by the contact when making contact” and “at most discloses a flexible junction where two raised portions intersect.” *Id.* at 18 (citing Ex. 1006, Fig. 9, 6:55–56). Patent Owner points to Vista’s AC prongs “snap fitted to said contact spring member” to argue that “snap fitting indicates that the flexibility of Vista’s contact is derived from the junction and not because the *material* of the

contact is flexible to exert force on contact.” *Id.* at 19–20 (citing Ex. 1006, claims 4, 7; Ex. 2019 ¶ 69).

Petitioner replies that “Vista meets the ‘flexibly biased’ requirement under the correct construction.” Reply 8. According to Petitioner, contact spring member 310 shown in Vista’s Figure 9 is coupled to the AC blade “through a spring action provided by the flexible contact spring member 310 of contact terminal 300, 301.” *Id.* at 9 (emphasis omitted; quoting Ex. 1006, 6:63–67); *see also* Pet. 22 (reproducing Vista Figure 9 and labeling contact spring member 310 “Flexibly Biased”). An annotated version of Vista’s Figure 9 is reproduced below.

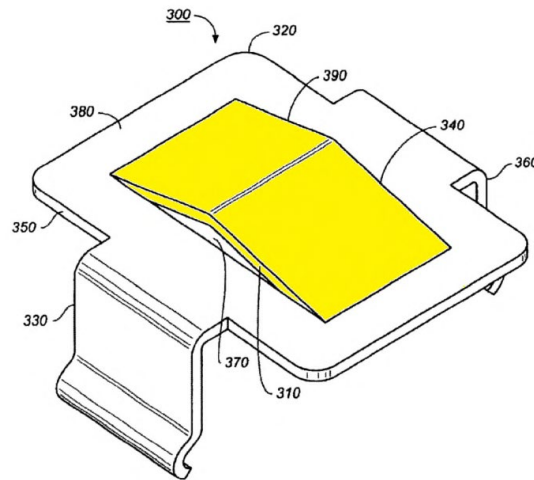


**FIG. 9**

Vista’s Figure 9 is an isometric view of the contact terminal of the plug assembly, and the annotated version reproduced above shows contact spring member 310 in yellow. Ex. 1006, 3:37–38. Even under Patent Owner’s proposed construction, Petitioner argues, Vista meets the “flexibly biased” requirement because the “material of Vista’s contact (a spring made of copper)” is flexible. Reply 11–13 (citing Ex. 1026 ¶¶ 24–27). Petitioner also argues that Patent Owner’s remaining arguments regarding “flexibility”

such as (1) that Vista's contact has a junction; (2) that Vista's contact has a fixed orientation; and (3) that Vista's contact does not "securely" couple with the AC blades, are "improper attempts to import limitations into the claims and are irrelevant." *Id.* at 13. In sum, even if "flexibly biased" meant "comprising a material that is flexible such that a force is exerted on contact," Petitioner argues that Vista's contact is "flexibly biased." *Id.* at 15. Petitioner also argues that the "snapping action" Patent Owner relies upon is "all in connection with the Figure 3 to 4 embodiment," whereas Petitioner relies on the Figure 9 embodiment, which "does not talk about any kind of snap action or snap junction," and "Vista talked about this structure in almost exactly the same way that the ['489] patent specification does." Tr. 22:8–26.

Patent Owner responds that "the material of Vista's contact is not disclosed as being flexible." Sur-Reply 4–5. Even if Vista's terminals are copper, Patent Owner argues, Vista "does not provide any details on the thickness of its contacts or how the contacts are fabricated." *Id.* at 5. Patent Owner adds that "Vista's fixed orientation junction is evidence that Vista's contact is not 'flexibly biased'" but rather "a snap junction comprising an inflexible material." *Id.* at 6.

Based on our construction of "flexibly biased" as "exerting a force when deformed (or flexed)," we determine that the combination of Gilliland and Vista discloses the "flexibly biased" limitation of the challenged claims. We are persuaded by Petitioner's arguments that, whether or not the ultimate claim construction requires that the material be flexible (and we have determined that it need not be), Vista discloses the "flexibly biased" limitation. As demonstrated by Petitioner, Vista's contact terminal 300

depicted in Figure 9 is made of “a conductive material, preferably copper” and includes a “flexible contact spring member 310” made up of first raised portion 390 and second raised portion 340 that are “flexibly coupled at a junction point.” Ex. 1006, 6:33–37, 6:55–59, 6:63–67; Reply 8–10. Patent Owner agrees that Vista’s contact is flexible. *See* Tr. 13:21–22 (“[T]he flexibility in Vista’s contact is from the junction, which Vista describes specifically as a flexible junction.”). The flexible coupling of the raised portions meets the “flexibly biased” limitation as we have construed it. Furthermore, we find that the raised portions are made of a flexible material (copper), crediting Dr. Kiaei’s testimony that “copper is a flexible material” and that Vista’s contact spring member 310 would have been fabricated in a manner that would provide the spring action that Vista discloses. Ex. 1026 ¶ 26 (citing Ex. 1006, 6:33–37, 6:63–67); *see* Ex. 1006, 6:63–67 (disclosing “a spring action provided by the flexible contact spring member 310”). Therefore, under our construction, and even under the construction proposed by Patent Owner, we are persuaded by Petitioner’s argument and evidence (Pet. 20–44, 47, 52; Ex. 1004 ¶¶ 84–133, 140, 152) that the Gilliland-Vista combination teaches the “flexibly biased” limitation of independent claims 1, 22, and 43.

*G. Parties’ Arguments – Potting Material*

Dependent claims 42 and 63 depend from claims 22 and 43, respectively, and recite “wherein the enclosure includes a thermally conductive potting material substantially filling an empty space of an interior of the enclosure.” Petitioner notes that “neither claim 42 nor claim 22 provide an antecedent basis for ‘the enclosure’” but construes the term as “an enclosure” for the purposes of its arguments. Pet. 50. Petitioner

argues that Gilliland’s body 14 with front cover 16 and housing 24 discloses an enclosure, as shown in Petitioner’s annotated Figure 2, reproduced below. *Id.* at 50–51.

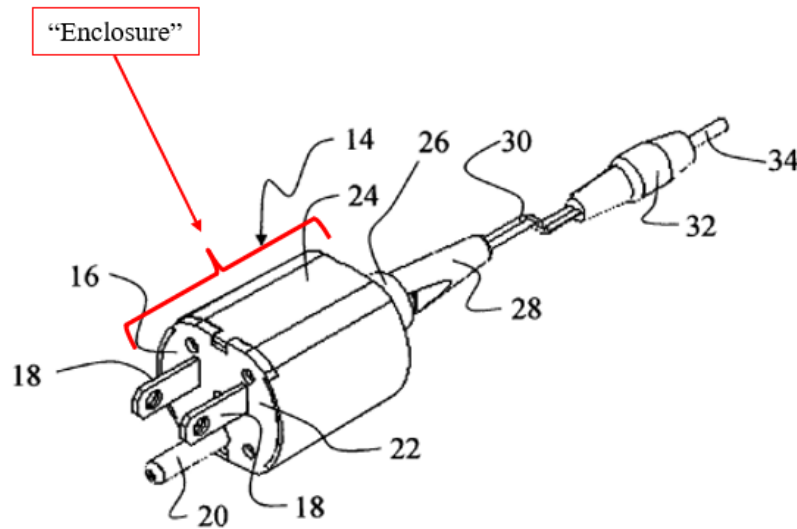


FIG. 2

Figure 2 is an isometric view of Gilliland’s circuit assembly and packaging. Ex. 1005, 2:1–2. According to Petitioner, Gilliland’s enclosure includes “high thermal conductivity encapsulating compound” injected through central aperture 70, “with venting through apertures 72 providing encapsulation of the circuit boards and connections for additional . . . thermal conduction for the circuit elements on the circuit boards.” Pet. 51 (emphasis omitted; quoting Ex. 1005, 8:52–59, 3:53–62).

Patent Owner responds that Gilliland fails to disclose or suggest “*substantially* filling an empty space of an interior of the enclosure.” PO Resp. 21. Patent Owner points to the testimony of Dr. Kiaei, who indicated that not necessarily every component in Gilliland is encapsulated, to argue that a POSITA “would not encapsulate all of the components in order to

maintain the flexibility of the contacts, or for conductivity or airflow,” and “would understand that substantially filling the interior of Gilliland’s housing with a rigid encapsulation compound would prevent having flexible contacts.” *Id.* at 21–22 (citing Ex. 2021, 54:24–55:11; Ex. 2019 ¶¶ 75–77). Patent Owner reiterates that its “position is that substantially filling the interior requires at least filling the interior to cover the contacts,” relying on portions of the ’489 patent’s specification providing that the “conductive potting material . . . substantially fills an empty space of an interior of the second section 204 and the enclosure 201.” Tr. 18:9–21 (citing Ex. 1001, 6:26–30, Fig. 2).

Petitioner replies that Patent Owner’s argument is “built on the false premise” that “every available portion within the prior art adapter must be filled with Gilliland’s encapsulant.” Reply 16. Petitioner argues that the plain language of the claims does not require that all of the components be encapsulated by a potting material, but, rather, only requires “substantially filling an empty space of an interior of the enclosure,” and “substantially” does not mean “completely.” *Id.* at 16–17. Petitioner elaborates that Patent Owner’s argument “implicitly, and improperly, turns the ‘substantially filling’ requirement into a requirement that every component within the enclosure is encapsulated,” whereas “the plain meaning of ‘substantially filled’ requires only that a significant portion is filled.” *Id.* at 18 (citing Ex. 1026 ¶ 30). Petitioner argues that we should reject Patent Owner’s arguments, which are “based on a flawed interpretation of the meaning of “*substantially* filling *an* empty space of *an* interior” as “*completely* filling but for a negligible amount the *entire* empty space of the *entire* interior.” *Id.* at 19. Petitioner also argues that Gilliland-Vista discloses or suggests the

“substantially filling” limitation, particularly because Gilliland provides for “encapsulation of the circuit boards and connections.” *Id.* at 19–20 (citing Ex. 1005, 8:51–59; Ex. 1026 ¶ 32). Petitioner disputes Patent Owner’s characterization of Dr. Kiaei’s testimony, which Petitioner says “is simply that a POSA might not want to encapsulate **everything** and would limit the encapsulation where appropriate and fill it elsewhere.” *Id.* at 21 (citing Ex. 1026 ¶¶ 34–35). Finally, Petitioner points out that Patent Owner’s position on “substantially filling” “directly contradicts the ’489 patent specification which expressly discloses multiple embodiments where the spring contacts are not covered in a thermally conductive potting material and no embodiment where they are covered.” *Id.* at 22 (citing Ex. 1001, Figs. 2, 3, 4; 6:26–29).

Patent Owner responds that its evidence “showed that it would not have been obvious to substantially fill the enclosure with a rigid encapsulant because that removed the flexibility of the contacts.” Sur-Reply 7 (citing PO Resp. 20–22). Patent Owner argues that “a POSITA would not have been motivated based on Gilliland’s teaching of a rigid encapsulant to substantially fill an enclosure with the rigid encapsulant.” *Id.* at 8–9.

We find that the language of claims 42 and 63 does not require filling the entire enclosure, let alone filling the enclosure in such a manner that would remove the flexibility of the contacts. We agree with Petitioner that “substantially filling an empty space of an interior of the enclosure” does not mean “completely filling” an empty space of an interior of the enclosure and “could be met by not including potting material over some components, e.g., the contacts, and having the potting material elsewhere in the power supply adapter enclosure.” Reply 17, 19. In other words, the “substantially filling”

language of the claims permits a level of filling that would not necessarily have to fill the entire enclosure and compromise the flexibility of the contacts by filling over them with potting material. We disagree that there is a metric to the “substantially filled” limitation as suggested by Patent Owner’s expert, i.e., where even one percent unfilled space may not be enough to satisfy the “substantially filling” limitation. Ex. 1027, 60:1–3, 63:1–17; Reply 17 n.4. Moreover, the claim recites filling “*an* empty space of *an* interior” of the enclosure, which encompasses a configuration in which the potting material fills less than the entirety of the interior of the enclosure.

We also agree with Petitioner that the ’489 patent discloses embodiments in which the spring contacts are not covered in a thermally conductive potting material, and discloses no embodiment where they are covered. Reply 22 (citing Ex. 1001, Figs. 2, 3, 4, 6:26–29). For example, the specification provides that “the second section 204 provides a suitable structure for enclosing the first section 202” and “second section 204 can include a thermally conductive potting material that substantially fills an empty space of an interior of the second section 204 and the enclosure 201.” Ex. 1001, 6:26–29. Figures 2a–d of the ’489 patent show the AC blades and spring contacts in first section 202 of the enclosure, but the potting material is only included in second section 204, where no spring contacts are present. *Id.* at Figs. 2a–d. Figures 3 and 4 likewise show no potting material around the spring contacts. *Id.* at Figs. 3, 4, 9:63–66, 11:59–63. Thus, the ’489 patent specification reinforces our view that claims 42 and 63 encompass a configuration in which the potting material fills less than the entirety of the enclosure. We agree with Petitioner, therefore, that the “substantially filling” claim limitation does not require completely filling the enclosure;

this is supported by the language and examples in the '489 patent specification. Accordingly, the degree of encapsulation in Petitioner's proposed Gilliland-Vista combination meets this limitation.

In sum, we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that the Gilliland-Vista combination would have rendered obvious the limitations of claims 42 and 63.

*H. Additional Challenged Claims and Limitations*

Petitioner contends that the additional limitations of claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 are taught or suggested by Gilliland and Vista, alone or in combination with additional references. Pet. 13–14, 20–90. Patent Owner does not present arguments for the patentability of claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 apart from its arguments for the patentability of independent claims 1, 22, and 43, and its arguments for the patentability of dependent claims 42 and 63. *See* PO Resp. We have reviewed the undisputed argument and evidence presented by Petitioner, and we find that the combination of Gilliland and Vista, alone or in further combination with additional references, teaches or suggests the additional limitations of claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63, and we find that a person of ordinary skill in the art would have been motivated to combine the references in the manner asserted by Petitioner with a reasonable expectation of success. Pet. 13–14, 20–90; Ex. 1004 ¶¶ 83–250. For the same reasons as set forth above for independent claims 1, 22, and 43, we determine that Petitioner has met its burden of proof for the disputed limitations of the challenged claims, whether expressly recited in the independent claims or incorporated by reference in the dependent claims. *See* 35 U.S.C. 112, para. 4 (2006) (“A claim in

dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.”). Therefore, based on the full record developed during the trial, we determine that Petitioner has met its burden to demonstrate unpatentability of the challenged claims.

### III. CONCLUSION<sup>10</sup>

For the reasons discussed above, we determine Petitioner meets its burden of establishing, by a preponderance of the evidence, that the challenged claims are unpatentable, as summarized in the following table:

| <b>Claims</b>                                                       | <b>35<br/>U.S.C.<br/>§</b> | <b>References/<br/>Basis</b>        | <b>Claims<br/>Shown<br/>Unpatentable</b>                            | <b>Claims Not<br/>Shown<br/>Unpatentable</b> |
|---------------------------------------------------------------------|----------------------------|-------------------------------------|---------------------------------------------------------------------|----------------------------------------------|
| 1, 4, 11, 12,<br>22, 25, 32, 33,<br>40–43, 46, 53,<br>54, 56, 61–63 | § 103                      | Gilliland,<br>Vista                 | 1, 4, 11, 12,<br>22, 25, 32, 33,<br>40–43, 46, 53,<br>54, 56, 61–63 |                                              |
| 5, 6, 26, 27,<br>47, 48                                             | § 103                      | Gilliland,<br>Vista, Jie            | 5, 6, 26, 27,<br>47, 48                                             |                                              |
| 7–9, 28–30,<br>49–51                                                | § 103                      | Gilliland,<br>Vista, Peck           | 7–9, 28–30,<br>49–51                                                |                                              |
| 10, 31, 52                                                          | § 103                      | Gilliland,<br>Vista, Peck,<br>Cheng | 10, 31, 52                                                          |                                              |

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<sup>10</sup> 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).

| <b>Claims</b>              | <b>35<br/>U.S.C.<br/>§</b> | <b>References/<br/>Basis</b>        | <b>Claims<br/>Shown<br/>Unpatentable</b>      | <b>Claims Not<br/>Shown<br/>Unpatentable</b> |
|----------------------------|----------------------------|-------------------------------------|-----------------------------------------------|----------------------------------------------|
| 39, 58–60                  | § 103                      | Gilliland,<br>Vista, Liao           | 39, 58–60                                     |                                              |
| 57                         | § 103                      | Gilliland,<br>Vista, Liao,<br>Cheng | 57                                            |                                              |
| <b>Overall<br/>Outcome</b> |                            |                                     | 1, 4–12, 22,<br>25–33, 39–43,<br>46–54, 56–63 |                                              |

#### IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner establishes, by a preponderance of the evidence, that claims 1, 4–12, 22, 25–33, 39–43, 46–54, and 56–63 of U.S. Patent No. 7,978,489 B1 are unpatentable; and

FURTHER ORDERED that this is a Final Written Decision; therefore, 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.

IPR2021-00308  
Patent 7,978,489 B1

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