

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

GUI GLOBAL PRODUCTS, LTD., D/B/A GWEE,
Patent Owner.

IPR2021-00472
Patent 10,562,077 B2

Before SALLY C. MEDLEY, SHEILA F. McSHANE, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

MEDLEY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition for *inter partes* review of claims 1–5 and 7–13 of U.S. Patent No. 10,562,077 B2 (Ex. 1001, “the ’077 patent”). Paper 2 (“Pet.”). GUI Global Products, Ltd., D/B/A Gwee (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Upon review of these papers, we instituted *inter partes* review, pursuant to 35 U.S.C. § 314, as to claims 1–5 and 7–13 based on the challenges set forth in the Petition. Paper 9 (“Decision to Institute” or “Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), Petitioner filed a Reply to Patent Owner’s Response (Paper 21, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 27, “Sur-Reply”). On May 19, 2022, we held an oral hearing. A transcript of the hearing is of record. Paper 32 (“Tr.”).

For the reasons that follow, we conclude that Petitioner has proven by a preponderance of the evidence that claims 1–5 and 7–13 of the ’077 patent are unpatentable.

A. Related Matters

The parties indicate that related district court litigations are *GUI Global Prods., Ltd. d/b/a Gwee v. Samsung Elecs. Co.*, No. 4:20-cv-02624 (S.D. Tex.) and *GUI Global Prods., Ltd. d/b/a Gwee v. Apple, Inc.*, No. 4:20-cv-02652 (S.D. Tex.). Pet. 82; Papers 4, 1–2. The parties also indicate that the ’077 patent is the subject of a petition filed by Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. in IPR2021-00337. Pet. 83; Papers 4, 2.

B. The '077 Patent

The Specification of the '077 patent describes how an apparatus may be used for cleaning view screens of electrical devices. Ex. 1001, 1:38–40. The '077 patent aims to address the lack of convenient cleaning materials faced by users' portable electronic devices. *Id.* at 1:60–2:14.

In one embodiment, a cleaning component for cleaning a view screen of an electronic device is coupled to a first case of the electronic device using magnetic attractive force. *Id.* at 2:19–24, Fig. 1B.

Figure 1B is illustrative and is reproduced below.

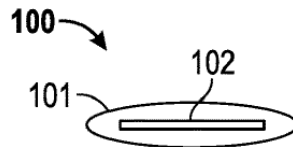


FIG. 1B

Figure 1B shows a side view of a cleaning component. *Id.* at 4:37–38. Cleaning component 100 includes ferromagnetic or ferrimagnetic substrate 102 covered by cleaning material 101, such as a fabric or a cloth. *Id.* at 6:29–49.

In another embodiment, a second case receives the cleaning component and also “functions to protect an electronic device’s primary case.” *Id.* at 2:47–60; Fig. 3.

Figure 3 is illustrative and is reproduced below.

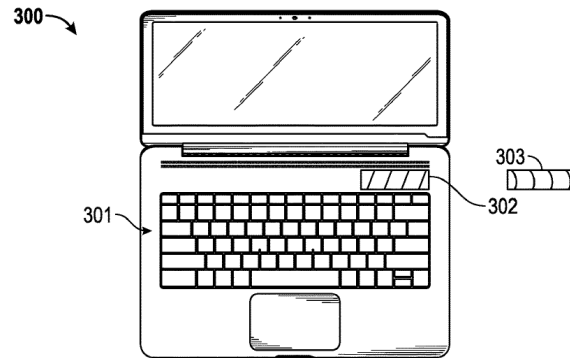


FIG. 3

Figure 3 shows a computer case configured to receive a cleaning component. *Id.* at 4:45–46. Laptop 300 has rectangular indentation 302 dimensioned for receiving cleaning component 303 which has a magnet. *Id.* at 8:62–9:2.

Figure 5A is also illustrative and is reproduced below.

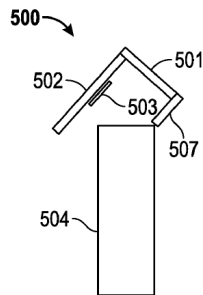


FIG. 5A

Figure 5A shows “a lateral type phone case configured to receive a cleaning component.” *Id.* at 4:49–50. Case 500 includes body 504 “which functions to hold a smart phone” and lid having tip 501, side 502, hinge 507, and cleaning component 503. *Id.* at 10:13–18.

The cleaning component is secured and adhered to a case via “dimensional stability to increase the security with which the clean components are adhered to the case.” *Id.* at 11:44–55; Fig. 9.

Figure 9 is illustrative and is reproduced below.

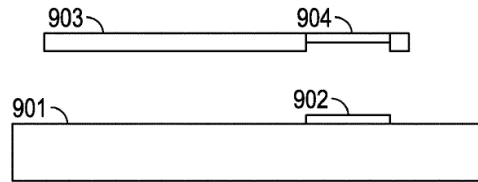


FIG. 9

Figure 9 shows a cleaning component “employing a structural feature to enhance adhesion.” *Id.* at 4:60–61. Device 901 has raised section 902 that is configured to fit within recess 904 of cleaning component 903. *Id.* at 11:49–51.

Still in another embodiment, the cleaning component has a magnetic element that activates or deactivates a magnetic switch. *Id.* at 3:6–8. The ’077 patent describes “activating or deactivating a device having a magnetic switch” as a “secondary application[]” and that “cleaning devices” “may also be manufactured without a cleaning component for use with the secondary application.” *Id.* at code (57); *see also id.* at 11:63–66. Thus, a device “may or may not include cleaning capabilities but will include a rare earth magnet or magnets” for “additional functionality.” *Id.* at 16:31–33, 41–43.

Figure 24 is illustrative and is reproduced below.

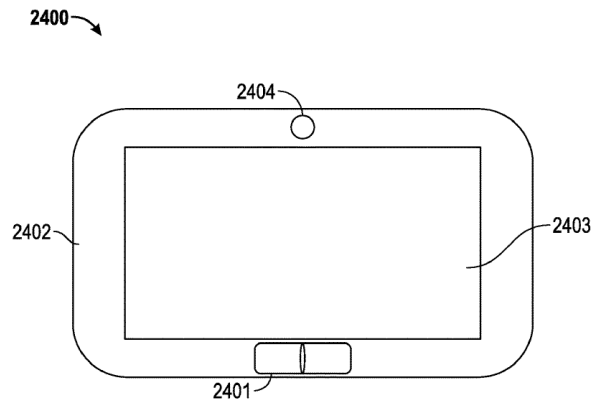


FIG. 24

Figure 24 shows a tablet computer having a switching device. *Id.* at 5:53–54. Tablet computer 2400 has switching device 2401 that “is selectively coupled to the front of the portable electronic device 2402 outside of the view screen 2403.” *Id.* at 18:6–10. A “magnetic switch is normally disposed with the portable electronic device but is shown [in Figure 24] for illustration purposes (2404).” *Id.* at 18:10–12. The ’077 patent describes that the switching component “may be picked up” and the switching device “is either applied directly to the magnetic switch or applied to either side of the switch and then slid past it to activate or deactivate the portable electronic device.” *Id.* at 18:13–18.

Figure 25, reproduced below, shows a side view of the switching device in Figure 24. *Id.* at 5:55–56, 18:19–20.

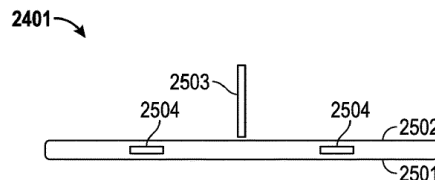


FIG. 25

Figure 25 shows switching device 2401 having bottom surface 2501, top surface 2502, and ferromagnetic or ferrimagnetic substrate 2504

disposed therebetween. *Id.* at 18:19–21, 23–25. Tab 2503 “on the top surface” facilitates manipulation of switching device 2401. *Id.* at 18:22–23.

C. Illustrative Claim

Petitioner challenges claims 1–5 and 7–13 of the ’077 patent. Claim 1 is an independent claim, and claims 2–5 and 7–13 depend therefrom. Claim 1 is reproduced below, which includes changes made per a Certificate of Correction.

1. A system comprising:

a portable switching device coupled to a portable electronic device;

wherein:

the switching device and the electronic device are configured to selectively couple to each other employing magnetic force;

the switching device comprises a first case;

the electronic device comprises a second case and an electronic circuit that is responsive to the switching device;

a first magnet is fully disposed within the electronic device;

the electronic device comprises at least one element selected from the group consisting of beveled edges, ridges, recessed areas, grooves, slots, indented shapes, bumps, raised shapes, and combinations thereof; configured to correspond to complementary surface elements on the switching device;

the portable switching device is configured to activate, deactivate or send into hibernation the portable electronic device;

the electronic device plays, pauses and/or changes the volume of a remote device;

the switching device includes a lid and hinge attaching the lid to the switching device;
the lid is recessed to configure to the electronic device; and
when coupled, the first case functions to protect the second case.

Ex. 1001, 21:38–22:18, p.27.

D. Instituted Grounds of Unpatentability

We instituted *inter partes* review based on the following grounds of unpatentability under 35 U.S.C. § 103(a)¹ as follows (Dec. 7–8, 36):

Claim(s) Challenged	35 U.S.C §	Reference(s)/Basis
1, 2, 8, 9, 11	103(a)	Gundlach, ² Lee ³
2, 8	103(a)	Gundlach, Lee, Nishikawa ⁴
11	103(a)	Gundlach, Lee, Rosener ⁵
3, 7	103(a)	Gundlach, Lee, Brown ⁶
4, 5, 10, 12, 13	103(a)	Gundlach, Lee, Mak-Fan ⁷
1, 2, 8, 9, 11	103(a)	Gundlach, Lee, Kim ⁸
2, 8	103(a)	Gundlach, Lee, Kim, Nishikawa

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended several provisions of 35 U.S.C., including § 103. Because the ’077 patent has an effective filing before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

² U.S. Pat. Appl. Pub. No. US 2008/0132293 A1, published June 5, 2008 (Ex. 1005, “Gundlach”).

³ U.S. Pat. No. US 7,548,040 B2, issued June 16, 2009 (Ex. 1006, “Lee”).

⁴ U.S. Pat. Appl. Pub. No. US 2007/0145255 A1, published June 28, 2007 (Ex. 1059, “Nishikawa”).

⁵ U.S. Pat. Appl. Pub. No. US 2008/0076489 A1, published Mar. 27, 2008 (Ex. 1050, “Rosener”).

⁶ U.S. Pat. No. US 7,631,811 B1, issued Dec. 15, 2009 (Ex. 1008, “Brown”).

⁷ U.S. Pat. Appl. Pub. No. US 2008/0012706 A1, published Jan. 17, 2008 (Ex. 1010, “Mak-Fan”).

⁸ U.S. Pat. Appl. Pub. No. US 2011/0117851 A1, published May 19, 2011 (Ex. 1007, “Kim”).

Claim(s) Challenged	35 U.S.C §	Reference(s)/Basis
11	103(a)	Gundlach, Lee, Kim, Rosener
3, 7	103(a)	Gundlach, Lee, Kim, Brown
4, 5, 10, 12, 13	103(a)	Gundlach, Lee, Kim, Mak-Fan

II. DISCUSSION

A. Principles of Law

To prevail in its challenges to Patent Owner’s claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2019). A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.⁹ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill

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

⁹ Patent Owner does not present any objective evidence of nonobviousness as to the challenged claims.

workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). Petitioner relies on the declaration testimony of Dr. Jeremy Cooperstock, who testifies that a person having ordinary skill in the art “would have had at least a Bachelor’s degree in an academic area emphasizing electrical engineering, mechanical engineering, or a similar discipline, and at least two years of experience in the field working with electronic devices” and that “[s]uperior education could compensate for a deficiency in work experience, and vice-versa.” Pet. 7 (citing Ex. 1003 ¶ 20). Patent Owner relies on the declaration testimony of Dr. Hamid Toliyat, who applies a similar definition and testifies that a person having ordinary skill in the art “would have been someone having either a bachelor’s degree in electrical engineering, computer science, or mechanical engineering with some level of post-baccalaureate electronic device or system design experience, or someone with an equivalent level of experience and training through other means.” PO Resp. 5 (citing Ex. 2022 ¶ 31). Dr. Toliyat further testifies that “Dr. Cooperstock’s definition of a POSITA¹⁰ is somewhat different than mine; however, my opinions in this declaration would be the same regardless of whether or not my description or Dr. Cooperstock’s description of a POSITA is used.” Ex. 2022 ¶ 33.

We adopt Petitioner’s definition of the level of skill for purposes of this Decision, except that we delete the phrase “at least” to avoid ambiguity in the definition of the level of skill. Patent Owner’s proposed level overlaps substantially with Petitioner’s proposed level. Even if we adopted Patent Owner’s proposed level of qualifications, the outcome would remain the same.

¹⁰ Person of ordinary skill in the art.

C. Claim Construction

In an *inter partes* review, “[claims] of a patent . . . shall be construed using the same claim construction standard that would be used to construe the [claims] in a civil action under 35 U.S.C. 282(b), including construing the [claims] in accordance with the ordinary and customary meaning of such [claims] as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *See* 37 C.F.R. § 42.100(b) (2019); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

For purposes of this Decision, we need not expressly construe any claim terms. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

D. Asserted Obviousness of Claims 1, 2, 8, 9, and 11 over Gundlach and Lee

1. Gundlach

Gundlach describes a device that operates as a wireless headset and can be stored and charged in a host device such as a laptop computer or a cell phone. Ex. 1005 ¶ 2. Gundlach indicates a desire for mobility while managing peripherals that accompany a portable computer. *Id.* ¶ 3. To this end, Gundlach discloses that its device’s “relatively thin shape may allow the headset to be stored and charged in a portable cradle” and the “portable cradle may be a holder, clip, case or card that may fit inside a standard expansion slot.” *Id.* ¶ 56.

Figure 1 is illustrative and is reproduced below.

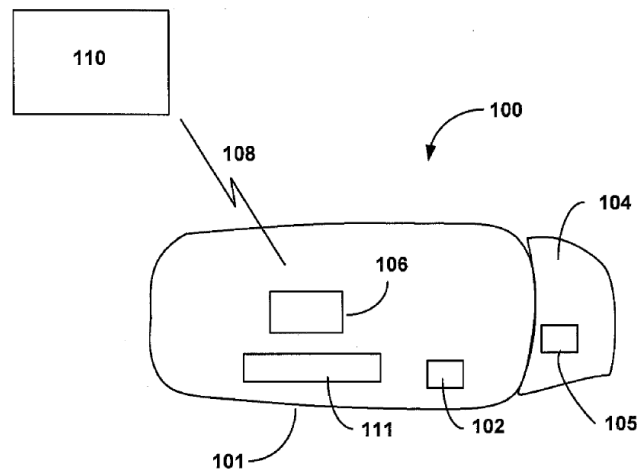


FIG. 1

Figure 1 shows a schematic view of a wireless device in communication with a host device. *Id.* ¶ 11. Wireless device 100 includes housing 101 and earpiece 104. *Id.* ¶ 58. Housing 101 includes microphone 102, power source 111 such as a battery, and transceiver 106 for sending and receiving information 108 from host device 110 such as a computer or a cell phone. *Id.* Earpiece 104 includes speaker 105. *Id.*

Gundlach’s wireless device may be held to a cradle by a magnet “which may be embedded in the cradle” and the wireless device “may also include a ferromagnetic portion” such as another magnet to which the magnet in the cradle may be attracted. *Id.* ¶ 68. The wireless device may also be held to the cradle by “mechanical means” such that the wireless headset is retained to the cradle. *Id.*

Figure 18b is illustrative and is reproduced below.

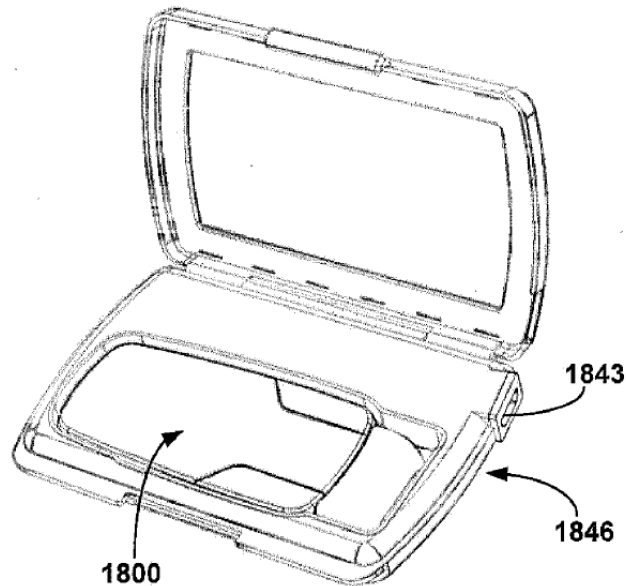


FIG. 18b

Figure 18b shows a perspective view of a case for retaining a wireless device. *Id.* ¶ 52. Wireless device 1800 is provided in a clamshell case that has recess 1846 “defined therein to accommodate the wireless device.” *Id.* ¶ 80.

2. Lee

Lee describes a wireless battery for charging a wireless headset. Ex. 1006, 3:21–22. Lee indicates that wireless headsets require their own power source such that many use rechargeable batteries which require a method for recharging. *Id.* at 1:25–29. Lee thus provides a method for wirelessly charging a battery in a wireless headset. *Id.* at 3:32–33.

Figure 5 is illustrative and is reproduced below.

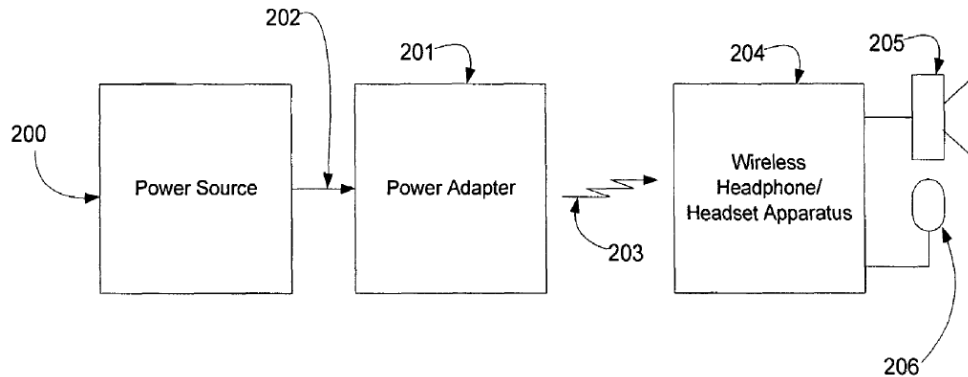


FIG. 5

Figure 5 shows a block diagram for wireless battery charging of a wireless headset. *Id.* at 2:14–15. Power source 200 provides energy via conductive means 202 to power adapter 201. *Id.* at 3:32–35. Power adapter 201 provides power to wireless headset apparatus 204 via non-conductive means 203, which is “typically inductive coupling.” *Id.* at 3:35–37. Lee indicates that energy can be transferred to a wireless headset via inductive coupling to an energy collection element which is then transferred to a battery via a battery charging circuit. *Id.* at 4:27–31. A headset circuit that is powered by the battery provides a drive signal to a transducer, in which the transducer has a dual purpose of producing sound and “receiving magnetic energy via [a] wireless magnetic field.” *Id.* at 4:32–39.

3. Discussion

Petitioner contends that claims 1, 2, 8, 9, and 11 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach and Lee. Pet. 8–47. In support of its showing, Petitioner relies upon the declaration of Dr. Jeremy Cooperstock. *Id.* (citing Ex. 1003).

Patent Owner argues that it would not have been obvious to combine Gundlach and Lee. PO Resp. 1–3, 9–40. Patent Owner also argues that several limitations are not taught or suggested by the combination of Gundlach and Lee. *Id.* at 41–57. In support of its arguments, Patent Owner relies upon the declaration of Dr. Hamid Toliyat (Ex. 2022). We first consider whether it would have been obvious to combine Gundlach and Lee, as the parties do, and then address the arguments regarding claim limitations.

For the reasons that follow, we conclude that Petitioner has met its burden of proving by a preponderance of the evidence that claims 1, 2, 8, 9, and 11 would have been obvious in view of the asserted prior art.

a. Gundlach in Combination with Lee

Claim 1 recites a “portable switching device,” or “switching device,” and a “portable electronic device,” or “electronic device.” Petitioner proposes modifying Gundlach’s portable charging case with Lee’s inductive charging circuit to meet the “portable switching device” limitation. *See, e.g.,* Pet. 20–21. Petitioner further proposes modifying Gundlach’s portable wireless headset with Lee’s inductive headset circuitry to meet the “portable electronic device” limitation. *See, e.g., id.* at 28–30, 33–34. Petitioner provides several reasons to combine Gundlach and Lee.

In particular, Petitioner contends that Gundlach describes a wireless headset that is stored and charged in a portable cradle such as a holder, clip

case, or card. Pet. 13 (citing Ex. 1005 ¶ 55). Petitioner further contends, and we find, that although Gundlach generally describes that the case may contain charging circuitry and electrical contacts, Gundlach does not expressly describe the manner in which the headset’s charging circuitry responds when placed in the cradle for charging. *Id.* Petitioner argues, and we agree, that “[a] POSITA considering Gundlach, and noting its limited disclosure on charging, would have seen a need for elaboration and description of design options.” *Id.* (citing Ex. 1003 ¶ 35). According to Petitioner, a person of ordinary skill in the art “seeking a supplement to Gundlach, . . . would have encountered Lee’s disclosure on charging in the familiar context of wireless headsets.” *Id.* (citing Ex. 1003 ¶ 35).

Petitioner argues, and we agree, that a person of ordinary skill in the art would have been motivated to exchange Gundlach’s conductive charging components with Lee’s more thoroughly explained inductive charging components. *Id.* at 14 (citing Ex. 1003 ¶ 37). We also agree with Petitioner’s contentions that the person of ordinary skill in the art would have recognized that inductive charging is a suitable alternative to conductive charging and would have appreciated benefits of inductive charging, such as enhanced reliability. *Id.* at 15–16 (citing Ex. 1003 ¶¶ 40–43; Exs. 1020–1022; Ex. 1006, 1:62–2:2). Petitioner further contends, and we agree, that employing Lee’s inductive charging solution in Gundlach’s device would result in a more compact form factor and interoperability absent the added bulk of a standardized connection. *Id.* at 16 (citing Ex. 1003 ¶¶ 44–45; Ex. 1005 ¶¶ 56–57, 66; Ex. 1006, 2:62–66, 4:55–57, Figs. 12, 16, 18, 19; Ex. 1029).

Patent Owner argues that “Gundlach provides ample disclosure concerning its conductive charging” and that “conductive charging of a

consumer device such as a headset would be a relatively simple and straightforward process for a POSITA” such that there would be no need to look beyond Gundlach’s teachings. PO Resp. 9 (citing Ex. 2022 ¶ 88¹¹), *id.* at 1–2. Dr. Toliyat, who testifies the same, does not support his conclusions with a sufficient factual basis. Ex. 2022 ¶ 88. For example, Dr. Toliyat does not explain how Gundlach provides ample disclosure concerning its conductive charging and we find that Gundlach does not. Rather, Gundlach describes that the case may contain “charging circuitry,” but does not describe what the circuitry contains. Ex. 1005 ¶ 80. Dr. Cooperstock’s testimony is entitled to substantial weight that “[w]hile robust on structural aspects of the wireless headset and storage solutions, Gundlach provides significantly less guidance and implementation details on the subject of charging” because his testimony is supported by Gundlach itself. Ex. 1003 ¶ 35 (citing Ex. 1005 ¶¶ 69, 73, 79, 80).

Moreover, Dr. Toliyat does not provide sufficient evidence to support his conclusion that, at the time of the invention, conductive charging for a wireless headset would have been simple and straightforward. Ex. 2022 ¶ 88. Thus, his testimony does not undermine Dr. Cooperstock’s sufficient explanation that a “POSITA considering Gundlach, and noting its limited disclosure on charging, would have seen a need for elaboration and description of design options to implement the charging functionality,” which would have led the POSITA to Lee, also directed to wireless headsets. Ex. 1003 ¶ 35. As Dr. Cooperstock points out, and we agree, a “POSITA would have immediately noted Lee’s similarity to Gundlach” as Lee

¹¹ We understand Patent Owner’s citation to Exhibit 1022 is a typographical error and that Exhibit 2022 was intended.

“discloses multiple embodiments for storing and charging a wireless headset in a ‘power adapter’ illustrated as a protective case” where “Lee provides clear circuit diagrams to guide implementation in the same context as Gundlach—wireless headsets.” *Id.* ¶¶ 36, 38. Thus, Patent Owner’s argument that Petitioner “is merely using hindsight reconstruction to advocate Lee’s Fig. 12 solution because the ‘dual role’ transducer coil design incorporates switch 470” does not undermine Petitioner’s arguments. PO Resp. 32 (citing Ex. 2022 ¶ 149). Patent Owner’s argument overlooks Petitioner’s persuasive reasoning that a POSITA considering Gundlach, and noting its limited disclosure on charging, would have seen a need for elaboration and description of design options to implement the charging functionality. Pet. 13 (citing Ex. 1003 ¶ 35).

Next, Patent Owner argues that a person of ordinary skill in the art would not have sought out Lee’s inductive charging as a suitable option for the charging circuitry in Gundlach, because inductive charging was inefficient, not recognized as an industry alternative to conductive charging, and not utilized in low power consumer electronic products. PO Resp. 10–15 (citing Ex. 2022 ¶¶ 92–96), 17 (inductive charging is less efficient and slower than conductive charging), 22–26. Lee describes a low power electronic device that utilizes inductive charging as an alternative to conductive charging like that utilized in Gundlach. Ex. 1006, 3:15–6:4; Pet. Reply 1–2¹². As Lee explains, conductive charging (like that used by

¹² Although Patent Owner argues that Petitioner’s assertion of a motivation based on Lee’s teachings is a new theory (PO Sur-Reply 8), we do not agree. The Petition discusses Lee’s teachings offering advantages to Gundlach (Pet. 13–14), with Dr. Cooperstock testifying that Lee discloses its enhanced “reliability,” in view of the known failure-prone nature of electric contacts, and that “a POSITA would have appreciated that the benefits of inductive

Gundlach) was known to “add size by way of the necessity of connectors and increase the risk of failure via failure of mechanical components caused by fatigue and corrosion of contact elements.” Ex. 1006, 1:62–2:1; Pet. Reply 1. Accordingly, Lee itself provides reasons why a person having ordinary skill in the art would have sought to modify Gundlach to include Lee’s inductive charging.

We have considered Dr. Toliyat’s testimony that at the time of the invention he was not aware of any hand-held, consumer portable earpiece charging systems that did not use conductive charging to charge an earpiece from a portable, battery powered case. Ex. 2022 ¶¶ 96, 99. We determine that such testimony is not particularly relevant to the obviousness determination before us because it focuses too narrowly on *consumer* portable earpiece charging systems.¹³ Also, to the extent that Dr. Toliyat’s

charging disclosed by Lee also would apply to Gundlach’s embodiments.” Ex. 1003 ¶ 42 (citing Ex. 1006, 1:62–2:2, 3:17–20).

Additionally, even though we do not find that Petitioner raises a new issue in the Reply, Patent Owner argues for the first time in the Sur-Reply that Lee’s teachings are limited, that is, they “might arguably suggest, if anything, some advantage [of inductive charging], if any, over a USB cord.” PO Sur-Reply 9 (citing Ex. 1006, 1:62–2:2). We do not find this argument persuasive because Patent Owner has failed to show that Gundlach is limited to charging of the headset battery from the case battery. Gundlach discloses that the case *may* contain a reserve power supply, such as a reserve battery. Ex. 1005 ¶ 80. If a battery is not used, power could be sent to the headset battery via the power supply adapter in the case. *Id.* In this case, Gundlach’s charging of the wireless headset would not be “from a portable battery powered device to portable battery powered device,” as Patent Owner contends and instead would be similar to Lee’s charging by USB connection which is replaced by inductive charging.

¹³ Moreover, during cross examination, Dr. Toliyat confirmed that he did not recall having ever done any work, research into, or provided testimony

testimony presents a differentiation based on charging from a portable battery powered device, Dr. Toliyat has failed to support the assertion that Gundlach is limited to charging from a portable, battery powered case, as explained *supra* note 12. In any event, and as Petitioner points out, “the Wireless Power Consortium—a multi-national group of electronics companies formed in 2008—promoted *commercial* adoption of inductive charging by standardizing specifications for inductive transmitters and receivers.” Pet. Reply 9–10 (citing Ex. 2032¹⁴). Exhibit 2032 describes that the Wireless Power Consortium (WPC), comprised of “a group of Asian, European, and American companies in diverse industries, including electronics manufacturers” has defined “the type of inductive coupling (coil configuration) and the communications protocol *to be used for low-power wireless devices*.” Ex. 2032, 1 (emphasis added).

Based on the record before us, inductive charging was a known alternative to conductive charging, and beneficial over conductive charging in some aspects. Ex. 1006, 1:62–2:1, 3:15–6:4; Ex. 1003 ¶¶ 41–43; Ex. 1023, 1:39–60 (recognizing problems with exposed contacts on wireless headsets and seeking inductive charging as a preferred alternative), 3:25–29, 5:1–4 (describing an inductive battery charger for use with wireless headsets); Ex. 1029, 8:35–42 (describing inductive charging for a wireless headset such that “[t]he earbud advantageously does not require charging

related to earbuds or headsets. Ex. 1088, 19:19–21. Thus, to the extent his testimony would be relevant (Ex. 2022 ¶¶ 96, 99), such testimony is entitled to diminished weight based on Dr. Toliyat’s confirmation during cross examination of his lack of experience with headsets or earbuds.

¹⁴ Patent Owner submitted Exhibit 2032 into evidence and argues that it is relevant to what a POSITA would have known at the time of the invention. See, e.g., Ex. 2022 ¶ 143, n.11.

contacts on its small exterior surface when charging is performed with inductive charging”). We agree with Petitioner that to the extent there were known inefficiencies with inductive charging, a person having ordinary skill in the art would have known of tradeoffs between inductive and conductive charging, but would still have known inductive charging to be a viable alternative to conductive charging. Pet. Reply 9–10. An obviousness determination does not turn on whether the proposed combination is the preferred or most desirable combination. *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004); *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014).

Patent Owner argues that Petitioner’s assertions that “conductors would add bulk and unreliability” is “false and contradicts the teachings of Gundlach itself.” PO Resp. 15–16. This is so, Patent Owner argues, because electrical contacts for charging Gundlach’s headset are only a couple of millimeters and “a POSITA would appreciate that electrical contacts are highly reliable.” *Id.* (citing 2022 ¶¶ 97–100), 18 (citing 2022 ¶ 114). Patent Owner’s arguments do not undermine Petitioner’s showing. We find that a person having ordinary skill in the art at the time of the invention would have known that eliminating electrical contacts, like those in Gundlach’s headset, would reduce bulk even if only “a couple of millimeters” because the conductors are eliminated entirely. Ex. 1005 ¶ 66, Figs. 9a, 9b.; Ex. 1003 ¶ 42. We further find that inductive charging was a known alternative to conductive charging, and in some aspects, more reliable than conductive charging. Ex. 1006, 1:62–2:1, 3:15–6:4; Ex. 1003 ¶¶ 41–43; Ex. 1023, 1:39–60, 3:25–29, 5:1–4; Ex. 1029, 8:35–42.

Patent Owner additionally argues that Lee’s inductive charging solution was not consistent with Gundlach’s compact form factor because

Gundlach’s charging contacts occupy less space than the necessary coils, circuitry, and larger battery needed by Lee’s inductive charging solution. PO Resp. 16–17 (citing Ex. 2022 ¶¶ 104–105), 18 (arguing that the Gundlach-Lee combination would require a larger, heavier form factor due to larger battery and additional circuitry). Patent Owner further argues that Gundlach’s clamshell case is capable of insertion into a laptop or phone slot, but replacing Gundlach’s conductive charging with inductive charging would violate these benefits. *Id.* at 17 (citing Ex. 2022 ¶¶ 106–109), 37.

Dr. Toliyat testifies that a POSITA would have understood that “Gundlach requires a compact form factor . . . because it wants to charge and provide data [to] the headset from a slot in a PC or phone” and “that Gundlach requires its headsets to be conductively charged inside a laptop or cell phone expansion slot.” Ex. 2022 ¶¶ 105, 109. Dr. Toliyat’s testimony is not entitled to substantial weight because it is not consistent with Gundlach. Gundlach’s language regarding charging per expansion slots is permissive, not mandatory. Ex. 1005 ¶ 56 (the portable cradle “*may* fit inside a standard expansion slot” or “a unique slot or cavity *may* be designed”) (emphases added), ¶ 70 (describing a configuration “that *may* allow the cradle to be inserted into a slot in a host device”) (emphasis added), ¶ 80 (describing a clamshell case for charging a headset through power supply adapter 184 capable of receiving USB connector without mention of charging through an expansion slot). Dr. Cooperstock’s testimony that “a POSITA would have appreciated that Lee’s approach was consistent with the expressly stated design goal of Gundlach to provide a compact form factor” is entitled to substantial weight, because it is consistent with Lee itself. Ex. 1003 ¶ 44. For example, Lee describes a charging solution for wireless headsets that achieves “a reduction of size and

weight” and further describes “a mechanism to re-charge batteries in wireless headphones/headsets in order to minimize size, weight, maximize reliability, and improve end user experience” through inductive charging. Ex. 1006, 1:62–66, 3:17–20, 3:32–37. On the other hand, we do not afford substantial weight to Dr. Toliyat’s conclusory testimony that the “Gundlach-Lee combination would require a larger and heavier form factor due to the additional circuitry and larger clamshell battery” because his testimony is not supported by a sufficient factual basis. Ex. 2022 ¶ 114. In any event, we agree with Petitioner that, Patent Owner’s size, shape, and componentry layout arguments throughout its brief are not particularly relevant, because as our reviewing court has cautioned, it is not whether the references could be physically combined. Rather, what is important is whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole. Pet. Reply 7 (citing multiple cases explaining the same).

In response to Petitioner’s showing that the Gundlach-Lee device would have provided charger interoperability, for example such that the headset could be recharged by a charging pad should the clamshell case not be available (Pet. 16), Patent Owner argues that Lee’s dual-purpose coil design would not work with a charging pad because there would be coil alignment issues. PO Resp. 17–19 (citing Ex. 2022 ¶ 116), 35–36 (citing Ex. 2022 ¶¶ 157–158). Patent Owner’s arguments do not undermine Petitioner’s showing. Pet. 16–17. Dr. Toliyat’s testimony focuses narrowly on what Lee allegedly teaches with respect to Lee’s Figure 16 alone. Ex. 2022 ¶ 157. We agree with Petitioner, however, that “Lee’s form factor is not the correct frame of reference,” and rather “[w]hat matters is that a POSITA would have understood that Gundlach’s form factor is particularly well suited for using a charging mat.” Pet. Reply 14–15. In other words,

Petitioner proposes Gundlach’s headset as modified by Lee “could be charged using other types of chargers,” which we find persuasive. Pet. 17 (citing Ex. 1003 ¶ 45). Moreover, Dr. Toliyat fails to explain sufficiently how he arrives at the assumption that Figure 16 does not apply to Lee’s Figure 12 embodiment due to how the coil would be arranged in the earpiece shown in Lee Figure 12. Ex. 2022 ¶¶ 157–158. Petitioner does not propose modifying the Gundlach-Lee combination by placing a coil in the Gundlach earpiece. *See, e.g.*, Pet. 14 where coil 465 is shown in the body of Gundlach’s headset, not the earpiece; Tr. 46:12–47:1. As such, we do not credit Dr. Toliyat’s testimony in that regard.

Patent Owner argues that Lee’s dual role transducer coil depicted in Lee Figure 12 would be much less efficient than conventional inductive charging and that the transducer coil would be small, vibrate a speaker diaphragm, result in a large air gap, and produce excessive heat. PO Resp. 26–31 (citing Ex. 2022 ¶¶ 131–148). Again, Patent Owner and Dr. Toliyat narrowly focus on bodily incorporating Lee’s Figure 12 circuit into Gundlach’s clamshell/headset arrangement without considering what the combined teachings of Gundlach and Lee would have suggested to a person having ordinary skill in the art. *See In re Keller*, 642 F.2d 413, 425 (Fed. Cir. 1981).¹⁵ Moreover, as explained above, Patent Owner incorrectly assumes that Petitioner proposes placing the dual role transducer coil in the earpiece of Gundlach. *See, e.g.*, PO Resp. 19 (referring to “the earpiece transducer coil”).

¹⁵ The Petition indicates that it does not propose bodily incorporating Lee into Gundlach. Pet. 16 n.2.

As explained above, inductive charging was a known alternative to conductive charging, and was known to be more reliable than conductive charging in some aspects. Ex. 1006, 1:62–2:1, 3:15–6:4; Ex. 1003 ¶¶ 41–43; Ex. 1023, 1:39–60, 3:25–29, 5:1–4; Ex. 1029, 8:35–42. As further explained above, to the extent there were known inefficiencies with inductive charging, a person having ordinary skill in the art would have known of tradeoffs between inductive and conductive charging, but would still have known inductive charging to be a viable alternative to conductive charging. Pet. Reply 9–10; Ex. 2032, 1. We have considered Dr. Toliyat’s testimony, but afford it little weight, because it is conclusory and without factual basis. For instance, Dr. Toliyat testifies that Lee presents several constraints that would result in inefficient inductive charging. Ex. 2022 ¶¶ 131–148. Dr. Toliyat testifies that “a POSITA would have to spend a significant amount of time and money on experimentation to try to make Lee’s Fig. 12 device work, especially with any meaningful level of efficiency” and that a “POSITA would have never seen a wire coil capable of both acting as a transducer and an inductive charging coil.” Ex. 2022 ¶ 147. Lee, however, teaches using a wire coil as a transducer and inductive charging coil and Dr. Toliyat does not explain why effort to “make Lee’s Fig. 12 work” constitutes undue experimentation rather than routine experimentation as he suggests. Moreover, Exhibit 1029 also describes embodiments of a headset with a multi-purpose coil that “functions multiply to receive charging power for [the] battery, generate a wake up signal, or receive an audio signal carrier.” Ex. 1029, 8:35–46. Thus, we do not give substantial weight to Dr. Toliyat’s testimony that a person having ordinary skill in the art would have never seen a dual purpose coil or that it would have required the person an undue amount of experimentation “to make Lee’s Fig. 12 device work.” Further,

and in contrast to his undue experimentation statements, Dr. Toliyat acknowledges that a POSITA would have known how to design an inductive charging system for Gundlach by arranging the dual purpose coil flat and parallel to a coil in Gundlach's case. Ex. 2022 ¶ 152.

Patent Owner argues that a "POSITA would understand that the charging system taught by Lee's Fig. 12 embodiment has no disclosed means of communication for controlling the charging process" such that "Lee's inductive charger would continue emitting its charging field" and "drain the clamshell case battery, resulting in a highly undesirable charging system." PO Resp. 36–39. Patent Owner further argues that even if there were a means of communication for controlling the charging process, such addition to the Gundlach-Lee device would result in significant energy loss. *Id.* We agree with Petitioner that Patent Owner's arguments are not particularly relevant to Petitioner's reasons to combine Gundlach and Lee, and that to the extent relevant, Lee itself teaches wireless communication between the wireless headphone/headset and power adapter. Pet. Reply 13–14 (citing Ex. 1006, 6:5–21). Contrary to Patent Owner's assertion (Sur-Reply 24), Petitioner's argument is responsive to the arguments presented in Patent Owner's Response, and not based on a "new theory." And, Petitioner cited the same in the Petition. *See, e.g.*, Pet. 37 (citing Ex. 1006, 6:5–21 and explaining that Lee teaches providing control signals "between the power adapter [clamshell case in Gundlach-Lee] and the headset").

For all of the above reasons, we determine that Petitioner has shown sufficient reasons to combine Gundlach and Lee.

b. Claim 1: “[a] system comprising” (preamble)¹⁶

For the preamble, Petitioner contends that Gundlach describes a system including a headset and case where the headset is stored and charged. Pet. 18 (citing Ex. 1005 ¶¶ 55–56, 80; Ex. 1003 ¶¶ 46–47; Ex. 1025; Ex. 1026). Patent Owner does not dispute that Gundlach describes a “system.” *See generally* PO Resp.

c. Claim 1: “a portable switching device coupled to a portable electronic device”

For the above limitation, Petitioner contends that “Gundlach-Lee satisfies” this limitation. Pet. 19. In particular, Petitioner contends, and we agree, that Gundlach’s wireless headset as modified by Lee is a portable electronic device as claimed. *Id.* at 19–22 (citing Ex. 1005 ¶¶ 55–58, 80, Figs. 18a, 18b; Ex. 1006, 3:50–62, 5:12–40, 6:31–38, Fig. 7; Ex. 1003 ¶¶ 48–50; Ex. 1024; Ex. 1027; Ex. 1100 ¶ 49; Section V.A.3).

Petitioner further contends, and we agree, that the combined teachings of Gundlach and Lee “yield a clamshell case that stores and inductively charges a wireless headset.” *Id.* at 20 (citing Ex. 1005 ¶¶ 56, 80, Figs. 18a–18b; Ex. 1006, 3:50–62, Fig. 7). In particular, Petitioner argues that Gundlach describes a portable cradle (case). *Id.* (citing Ex. 1005 ¶ 56). Petitioner further argues, and we find, that Lee describes an inductive charging case that activates a charging “switch” in a wireless headset. *Id.* at 20–21 (citing Ex. 1006, 5:12–40, 6:31–38, Figs. 12, 17; Ex. 1003 ¶ 50; Ex. 1001, 18:6–18). Petitioner contends, and we agree, that the “Gundlach-Lee” charging case (switching device) is coupled to the wireless headset (electronic device) in two alternative ways: (1) inductive coupling and (2)

¹⁶ We need not determine whether the preamble is limiting because, regardless, Petitioner shows that Gundlach meets the preamble.

physical coupling. *Id.* at 22 (citing Ex. 1003 ¶ 51; Ex. 1006, 3:31–62, Figs. 5–7; Ex. 1005 ¶¶ 55–56, 80, Figs. 18a–18b).

For reasons discussed above, Patent Owner’s arguments that a POSITA would not have combined Lee with Gundlach do not undermine Petitioner’s showing. PO Resp. 41. Patent Owner, otherwise, does not contest Petitioner’s showing as to the above limitation. *Id.*

d. Claim 1: “the switching device and the electronic device are configured to selectively couple to each other employing magnetic force”

For the above limitation, Petitioner contends that the Gundlach-Lee charging case (switching device) is both inductively and physically coupled to the wireless headset (electronic device) employing magnetic force and that either the inductive or physical coupling meets the claim limitation. Pet. 23–25. For purposes of this Decision, we focus our analysis on Petitioner’s physical coupling showing.

Petitioner argues, and we agree, that a POSITA would have appreciated that physical coupling exists when a user chooses (selects) to install the wireless headset in the charging case. *Id.* at 23 (citing Ex. 1003 ¶ 53). Petitioner contends, and we agree, that with respect “to the physical ***coupling***, Gundlach describes an embodiment where a wireless headset is secured within a cradle by both ‘mechanical means’ and the attractive ***magnetic force*** between respective embedded magnets.” *Id.* at 24 (citing Ex. 1005 ¶¶ 67, 68, Figs. 10a–10c; Ex. 1003 ¶ 55). Petitioner provides reasons for incorporating the embedded magnets disclosed in Gundlach’s cradle embodiment in the clamshell case embodiment. *Id.* at 24–26 (citing Ex. 1003 ¶¶ 56–62; Ex. 1005 ¶¶ 56, 68, Figs. 10, 18; Exs. 1020, 1030–1032).

First, Petitioner contends, and we agree, that “Gundlach’s own teachings and suggestions would have motivated a POSITA to include embedded magnets in the clamshell case embodiment.” *Id.* at 25. This is so, Petitioner argues, because Gundlach describes that “the headset is ‘stored and charged in a portable cradle’ taking the form of ‘a holder, clip, case or card.’” *Id.* (quoting Ex. 1005 ¶ 56). Petitioner contends, and we agree, that “Gundlach teaches the POSITA that a ‘case’ is an exemplary type (species) of ‘portable cradle’ (genus).” *Id.* (citing Ex. 1003 ¶¶ 57–58). Petitioner further argues, and we agree, “[w]ith this genus-species relationship between ‘cradles’ and ‘cases’ in mind, the POSITA would have understood that certain features of Gundlach’s Figure 10 cradle embodiment—such as the coupling via magnetic force—are generally applicable to the Figure 18 clamshell case embodiment.” *Id.*

Second, Petitioner argues that a person having ordinary skill in the art “would have viewed inclusion of embedded magnets in a clamshell case as merely the use of a known technique—i.e., magnetic force to achieve a physical coupling, per the Figure 10 cradle embodiment—to improve a similar device—i.e., the Figure 18 clamshell case embodiment—in the same way.” *Id.* Petitioner contends, and we agree, that for the Gundlach Figure 10 embodiment, Gundlach suggests that embedded magnets supplement mechanical means for holding the wireless headset to the cradle. *Id.* (citing Ex. 1005 ¶ 68). Petitioner further contends, and we agree, that the Figure 18 embodiment also includes a mechanical solution for retaining the wireless headset (the clamshell lid) that would be supplemented in a substantially similar way by embedded magnets. *Id.* at 25–26 (citing Ex. 1003 ¶ 59). Petitioner asserts, and we agree, that a “POSITA would have understood that incorporating embedded magnets would promote retention of the wireless

headset within the clamshell case if the case were opened inadvertently (e.g., dropped or otherwise jarred),” would assist users with fitting the headset into the case by pulling the headset into place against the case, and would facilitate inductive charging by holding the headset firmly in place. *Id.* at 26 (citing Ex. 1003 ¶¶ 60–62; Ex. 1030, 1:59–64; Ex. 1031, 2–4; Ex. 1032; Ex. 1020).

Patent Owner argues that Petitioner’s showing is based on hindsight reconstruction. PO Resp. 42 (citing Ex. 2022 ¶ 172). Patent Owner further argues that “Apple’s genus/species argument” is unpersuasive and incorrect because “Gundlach does not state that a clamshell case 1860 is a species of cradle, nor would a POSITA understand something with a lid to be a cradle,” and that the teachings of the cradle would not be applicable to the clamshell case. *Id.* at 43 (citing Ex. 2022 ¶ 173). Patent Owner’s arguments do not undermine Petitioner’s persuasive showing. Dr. Toliyat’s testimony that “Gundlach does not *state* that a clamshell case 1860 is a species of cradle” (Ex. 2022 ¶ 173 (emphasis added)) is misplaced and overlooks Gundlach’s description that the “*cradle may be a holder, clip, case, or card*” (Ex. 1005 ¶ 56 (emphases added)). Moreover, we do not afford substantial weight to Dr. Toliyat’s testimony that a person having ordinary skill in the art would not “understand something with a lid to be a cradle,” because such testimony is not supported by evidence. Ex. 2022 ¶ 173. We agree with Petitioner that a case as described in Gundlach is a type of cradle, such as the Figure 10 cradle. Pet. Reply 18 (citing Pet. 23–25; Ex. 1003 ¶¶ 55–58; Ex. 1005 ¶ 56).

Next, Patent Owner argues that “a POSITA would have no motivation to add an unnecessary magnet to further secure an already well secured earpiece in a clamshell case” and that adding an extra magnet would add no additional protection. PO Resp. 43–44 (citing Ex. 2022 ¶¶ 174–175). Dr.

Toliyat testifies the same, but his testimony is not entitled to substantial weight. For instance, Dr. Toliyat testifies that a POSITA would have appreciated that if the clamshell case was dropped with enough force to eject the earpiece, then adding an extra magnet would add no additional protection. Ex. 2022 ¶ 175. Dr. Toliyat fails to direct us to evidence to support the conclusion that adding a magnet to the clamshell case would add no additional protection if the clamshell case was dropped. Dr. Cooperstock's testimony that "magnets were commonly used long before the Critical Date in 2011 to retain mobile phones in vehicle dashboard mounts with sufficient force to prevent inadvertent detachment when jostled during use" is entitled to substantial weight because such testimony is supported by record evidence. Ex. 1003 ¶ 60 (citing Ex. 1030, 1:50–64 (describing a mobile phone vehicle mount where magnetic forces firmly hold a phone in engagement so that the phone will not move unintentionally)).

Moreover, Patent Owner does not address Petitioner's other reasons for why a POSITA would have been motivated to embed magnets into the clamshell case, which we determine are reasonable. In particular, we afford substantial weight to Dr. Cooperstock's reasonable assessment that "incorporating magnets would assist users, some of which may have lower levels of dexterity, with fitting the headset into the case," because "a magnetic attraction would pull the headset into place against the case." Ex. 1003 ¶ 61 (citing Ex. 1031, 2–4 (describing older users as a growing consumer group with a decrease in dexterity)). Dr. Cooperstock's testimony that "a POSITA would have known that incorporating magnets would facilitate inductive charging by holding the headset firmly in place within the case" is also entitled to substantial weight because it is supported by record evidence. *Id.* ¶ 62 (citing Ex. 1020, 2 (describing magnetic attraction

between receiver and charging mat to ensure that alignment is precise for efficient charging)).

Patent Owner argues that adding magnets would increase weight and the size of Gundlach's earpieces and risk getting the device stuck in Gundlach's laptop expansion slot. PO Resp. 44 (citing Ex. 2022 ¶ 177). We agree with Petitioner that "[s]ize and weight penalties are design tradeoffs that do not preclude obviousness." Pet. Reply 20. We further agree with Petitioner that Gundlach's clamshell case embodiment is not limited to fitting within the expansion slot of a laptop, as further explained above. *Id.*

e. Claim 1: "the switching device comprises a first case"

For the above limitation, Petitioner contends, and we agree, that "the combined teachings of Gundlach-Lee provide a **switching device** in the form of a clamshell inductive charging (**first**) **case**." Pet. 27 (citing Ex. 1003 ¶ 63). For reasons provided above, Patent Owner's arguments that "a POSITA would not be motivated" to "replace efficient conductive charging with highly questionable and inefficient inductive charging with a dual role transducer coil" do not undermine Petitioner's showing. PO Resp. 46. Patent Owner otherwise does not contest Petitioner's showing as to the above limitation. *Id.*

f. Claim 1: "the electronic device comprises a second case and an electronic circuit that is responsive to the switching device"

For this limitation, Petitioner contends, and we agree, that Gundlach's wireless headset (electronic device) includes a housing (second case). Pet. 28 (citing Ex. 1005 ¶¶ 58, 59, 65, Figs. 1, 2a–2f, 8; Ex. 1003 ¶¶ 64, 65; Ex. 1001, 6:2–8). Petitioner further contends, and we agree, that the combined teachings of Gundlach and Lee yield a clamshell case that stores and

inductively charges a wireless headset. *Id.* at 29 (citing Ex. 1005 ¶¶ 56, 80, Figs. 18a–18b; Ex. 1006, 3:50–62, Fig. 7). We also agree with Petitioner’s assertion that Lee teaches that the “wireless headset includes an *electronic* ‘battery charging *circuit*’ that ‘manages charging ... taking the raw energy received by the [energy collecting] coil and providing the proper voltage to the battery.’” *Id.* (quoting Ex. 1006, 4:62–66). Petitioner contends, and we agree, that in the combined Gundlach-Lee device, the battery charging circuit of the headset (electronic device) is responsive to the clamshell charging case (switching device) “which provides ‘[t]he energy received by the coil [and] transferred via the battery charging *circuit* to the battery.’” *Id.* (quoting Ex. 1006, 4:57–59). As further explained above with respect to Petitioner’s showing of a “switching device,” we agree with Petitioner that the Gundlach-Lee charging case would have resulted in an inductive charging case that activates a charging “switch” in a wireless headset. *Id.* at 20–21 (citing Ex. 1006, 5:12–40, 6:31–38, Figs. 12, 17; Ex. 1003 ¶ 50; Ex. 1001, 18:6–18).

Patent Owner argues that “[t]o a POSITA, the portion of Lee relied upon by Apple is not disclosed by Lee to involve anything more than the passive receipt of a charge by a battery charging circuit” and that “a POSITA would not understand such passive receipt of electric current flowing automatically from negative to positive to be switching.” PO Resp. 47 (citing Ex. 2022 ¶¶ 185–186). Dr. Toliyat testifies the same. Ex. 2022 ¶¶ 185–186. Dr. Toliyat’s testimony is conclusory and does not take into account what Lee teaches. We agree with Petitioner that “Lee’s battery charging circuit ‘manages charging of the battery by taking the raw energy received by the [energy collecting] coil and providing the proper voltage to the battery based on its type’” that amounts to more than just “passive

receipt of a charge.” Pet. Reply 21 (quoting Ex. 1006, 4:62–66). We afford substantial weight to Dr. Cooperstock’s testimony that Lee’s “battery charging *circuit* only transfers energy to the battery when the charging case (*switching device*) provides that energy through the inductive coupling, meaning that the battery charging circuit’s function is triggered by—i.e., *responsive to*—the charging case.” Ex. 1003 ¶ 66.

g. *Claim 1: “a first magnet is fully disposed within the electronic device”*

For the above limitation, Petitioner asserts, and we agree for the reasons discussed above, that “a POSITA would have been motivated to incorporate the embedded magnets of Gundlach’s cradle embodiment (Figures 10a–10c) into the clamshell case embodiment (Figures 18a–18b).” Pet. 30. Petitioner explains that Gundlach describes, with respect to the Figure 10 embodiment, that one magnet is embedded in the case and that the wireless headset may also include another magnet. *Id.* (citing Ex. 1005 ¶ 68; Ex. 1003 ¶ 67). Petitioner asserts, and we agree, that to the extent that Gundlach does not expressly state that the magnet of the wireless headset (electronic device) is fully disposed within the headset, a “POSITA would have understood as much or otherwise been prompted to pursue such a configuration for multiple reasons.” *Id.* at 31 (citing Ex. 1003 ¶¶ 68–71). The first reason is that, because Gundlach teaches an embedded magnet in the case, a POSITA would have been led to a similar design solution with respect to the magnet of the companion wireless headset. *Id.* (citing Ex. 1003 ¶ 69; Ex. 1005 ¶ 68). Second, Petitioner argues that there would have been predictable advantages such as maintaining the compactness envelope of the headset and protecting the magnet against corrosion, debris accumulation, and impact damage compared to an exposed magnet. *Id.*

(citing Ex. 1005 ¶¶ 56, 57; Ex. 1003 ¶ 70). Lastly, Petitioner contends that embedding the magnet into the housing of the wireless headset would have been a “menial design choice amongst a small number of options that would have produced substantially similar results.” *Id.* (citing Ex. 1003 ¶ 71). We determine that Petitioner’s reasons for making the proposed modification are sufficient.

For reasons provided above, Patent Owner’s argument that a POSITA would not be motivated to incorporate embedded magnets of Gundlach’s cradle embodiment into the clamshell case embodiment do not undermine Petitioner’s showing. PO Resp. 48.

h. Claim 1: “the electronic device comprises at least one element selected from the group consisting of beveled edges, ridges, recessed areas, grooves, slots, indented shapes, bumps, raised shapes, and combinations thereof; configured to correspond to complementary surface elements on the switching device”

For the above limitation, Petitioner contends, and we find, that Gundlach describes that the clamshell case (switching device) has a recess to accommodate the wireless headset and that the wireless headset, with “recessed areas” and “raised shapes,” is “configured to correspond” to the “complimentary surface elements” of the clamshell case (switching device) recess. Pet. 32–33 (citing Ex. 1005 ¶¶ 59, 80, Fig. 18b; Ex. 1003 ¶¶ 72, 73). We have addressed Patent Owner’s arguments that a POSITA would not have combined Gundlach and Lee. PO Resp. 48. Patent Owner makes no other arguments regarding the above limitation. *Id.*

- i. *Claim 1: “the portable switching device is configured to activate, deactivate or send into hibernation the portable electronic device”*

For this limitation, Petitioner contends that the combined teachings of Gundlach and Lee yield a clamshell case that stores and inductively charges a wireless headset that satisfies the claim phrase in four ways. Pet. 33. For purposes of this Decision, we focus our analysis on Petitioner’s first, second, and fourth showings and begin with the parties’ arguments with respect to Petitioner’s fourth showing.

For its fourth showing, Petitioner argues, and we agree, that a POSITA would have been motivated to configure the Gundlach-Lee clamshell charging case to place the wireless headset in a hibernation mode by deactivating at least the battery-powered headset circuit when the headset is stored and charging. *Id.* at 36–37 (citing Ex. 1006, 4:51–5:11; Ex. 1003 ¶¶ 79–80; Exs. 1033, 1060, 1061). Petitioner further contends, and we agree, that a “POSITA contemplating Gundlach-Lee would have recognized Lee’s teaching of a ‘wireless data communication channel’ for ‘provid[ing] control signals’ between the power adapter [clamshell case in Gundlach-Lee] and the headset.” *Id.* at 37 (citing Ex. 1006, 6:5–21, Fig. 15). Petitioner asserts, and we agree, that a “POSITA also would have appreciated that it was known to utilize a control signal for triggering component **deactivation** in a portable device, and that such a signal could be easily leveraged to **deactivate** Lee’s ‘headset circuit’” and that it was known to place portable devices into a hibernation mode. *Id.* at 37 (citing Ex. 1003 ¶ 81; Ex. 1033; Ex. 1060; Ex. 1061). Petitioner explains, and we agree, that a POSITA would have been motivated to deactivate the headset when not in use, such as when stored in the clamshell case to conserve battery power,

speed up the charging process, and to improve usability. *Id.* at 37–38 (citing Ex. 1003 ¶ 82).

Patent Owner argues, with respect to all of Petitioner’s showings, that “a POSITA would not be motivated to” replace Gundlach’s “efficient conductive charging with [Lee’s] highly questionable and inefficient inductive charging with a dual role transducer coil.” PO Resp. 49. For reasons provided above, this argument does not undermine Petitioner’s showing. For Petitioner’s fourth showing, Patent Owner also argues that the “headphone/headset circuit 468 in Fig. 12 would control power to the headphone consistent with whether the headset itself is powered on or off using its own on/off controls.” *Id.* at 52 (citing Ex. 2022 ¶ 203). Patent Owner further argues that “[t]he only external control signal is shown in a Fig. 14 device, not the Fig. 12 device” and that “there is no teaching or suggestion of even those control signals being used to power or depower the headphone.” *Id.* (citing Ex. 1006, 5:56–6:4; Ex. 2022 ¶ 203). Lastly, Patent Owner argues that without more details, “a POSITA would not understand that merely turning on power to an earphone would constitute activating a Gundlach earpiece, or that merely turning off power to an earphone would constitute deactivating or hibernating a Gundlach earpiece.” *Id.* (citing Ex. 2022 ¶ 204).

Patent Owner’s arguments do not undermine Petitioner’s fourth persuasive alternate showing. We have considered Dr. Toliyat’s testimony in support of the arguments, which largely repeats the above arguments. Dr. Toliyat’s testimony is not entitled to substantial weight because his testimony is misplaced and narrowly focused on what Lee in isolation discloses. For instance, Dr. Toliyat’s testimony that “Lee’s Fig. 12 embodiment relied upon by Dr. Cooperstock lacks any disclosed means for

such control signals to be sent or received” and that “[t]he only external control signal is shown in a Fig. 14 device, not the Fig. 12 device” is of no moment, as Petitioner does not rely solely on the Lee Figure 12 embodiment and does not rely at all on the Figure 14 embodiment. Ex. 2022 ¶ 203; Pet. 36–38. As Petitioner points out, “the Petition does not rely on the disclosure in Figure 12,” but “presents a theory of obviousness where the POSITA would have been motivated to utilize the control signals Lee discussed regarding Figure 15 to deactivate the headset circuit and/or place the wireless headset in hibernation mode.” Pet. Reply 23–24 (citing Pet. 36–37; Ex. 1003 ¶¶ 79–82; Ex. 1033; Ex. 1060; Ex. 1061). Accordingly, Dr. Toliyat’s testimony that “[w]ithout more details of what might constitute activation, deactivation or hibernation, a POSITA would not understand that merely... turning off power to an earphone would constitute deactivating or hibernating” is entitled to no weight because Dr. Toliyat overlooks the specific details provided by Petitioner. Ex. 2022 ¶ 204.

We give substantial weight to Dr. Cooperstock’s testimony that deactivating “the ‘headset circuit’ of the Gundlach-Lee headset is consistent with a POSITA’s understanding of placing the wireless headset in a minimal-power *hibernation* mode,” because his testimony is based on a sufficient factual basis. Ex. 1003 ¶ 80 (citing Ex. 1060 ¶ 5 (describing that a portable computing device can be designed to transition into a hibernation mode in which some components of the device that consume significant power, are powered down); Ex. 1061 ¶ 43 (describing that circuitry may not receive power in the hibernation mode)). We also give substantial weight to Dr. Cooperstock’s testimony that Lee teaches a wireless data communication channel for providing control signals between the power adapter (clamshell case in the Gundlach-Lee combination) and the headset, and that it was well

known at the time of the invention to utilize control signals for triggering component deactivation in a portable device and that such a signal could be used to deactivate Lee's headset circuit. Ex. 1003 ¶ 81 (citing Ex. 1006, 6:5–21, Fig. 15; Ex. 1033 ¶ 30). We determine that a person having ordinary skill in the art would have been motivated to utilize Lee's control signal from the power adapter (clamshell case in Gundlach-Lee) to deactivate the combined Gundlach-Lee wireless headset (to deactivate the "headset circuit") in order to "conserve battery power and speed up the charging process." Ex. 1003 ¶ 82. For all of the above reasons, Petitioner has sufficiently accounted for the claim 1 limitation that "the portable switching device is configured to activate, deactivate or send into hibernation the portable electronic device."

For completeness, we address Petitioner's first and second alternative showings, which we also determine are persuasive. For its first showing, Petitioner contends, and we agree, that in the Gundlach-Lee system, the battery charging circuit of the headset that manages charging of the headset battery is activated by the clamshell charging case because the case provides "[t]he energy received by the coil [and] transferred via the battery charging circuit to the battery." Pet. 34 (citing Ex. 1006, 4:57–59). Petitioner asserts that a POSITA would have understood that the battery charging circuit of the headset is activated to an operative state (transferring energy to the battery) from an inoperative state in response to receiving energy from the clamshell case. *Id.* (citing Ex. 1005 ¶ 75).

For its second showing, Petitioner argues that Lee provides a switch triggered by the charging case (switching device) that activates the headset (electronic device). *Id.* at 34–35 (citing Ex. 1006, 5:12–40; Ex. 1003 ¶¶ 76, 77; Ex. 1001, 4:1–7, 17:55–59, 18:13–18). In particular, Petitioner argues,

and we agree, that when the switch is open, the battery charging circuit is isolated from the energy-receiving coil and thus inoperative to charge the battery, but when the switch is closed, the battery charging circuit is connected to the energy-receiving coil and thus operative to charge the battery. *Id.* at 34 (citing Ex. 1003 ¶ 76). Petitioner explains, and we agree, that Lee discloses that the switch automatically closes to the charge position when near the power adapter (which in the proposed combination is the Gundlach-Lee clamshell case) or opens/closes in response to a wireless control signal from the power adapter (the Gundlach-Lee clamshell case). *Id.* at 35 (citing Ex. 1006, 5:30–40). Petitioner argues that “[t]o the extent the ’077 patent’s specification equates deactivating/activating a switch in the portable electronic device with deactivating/activating the device (as claimed), Lee’s disclosure of a switch in the headset triggered by the charging case to open/close, satisfies” the limitation. *Id.* (citing Ex. 1001, 4:1–7, 18:13–18). Petitioner further argues that “[t]o the extent the ’077 patent’s specification suggests using a switch in the portable electronic device to change between on/off modes of the device is an example of activating/deactivating the device (as claimed), Lee’s similar disclosure of a switch in the headset that changes the headset between charging/non-charging modes satisfies” the limitation. *Id.* (citing Ex. 1001, 17:55–59, 18:13–18).

Patent Owner argues, regarding Petitioner’s first and second showings, that “[t]o a POSITA, the portion of Lee relied upon by [Petitioner] again discloses nothing more than the passive receipt of a charge by the headset battery.” PO Resp. 49–50 (citing Ex. 2022 ¶¶ 193–194, 196–197). For reasons discussed already, we are not persuaded by such argument as we agree with Petitioner that “the Petition does not rely on ‘passive

receipt of a charge” but instead “shows how a POSITA would have understood various aspects of the Gundlach-Lee wireless headset to transition to an operative state (activation) or inoperable state (deactivation).” Pet. Reply 22.

For instance, and with respect to the second mapping, we agree with Petitioner that “Patent Owner does not contest that Lee’s disclosure of opening/closing a switch comports with the ’077 Patent’s specification.” *Id.* at 22–23 (citing Pet. 34–35; Ex. 1001, 4:1–7, 18:13–18). We agree with Petitioner’s showing that Lee’s switch in the Gundlach-Lee wireless headset (portable electronic device) changing the headset between charging/non-charging modes is not a passive receipt of a charge, because the charge does not occur unless, for example, the switch is closed to provide charge to the headset charging circuit. Ex. 1003 ¶ 76. The switch is triggered by the charging case (switching device) that activates the headset (electronic device). *Id.* ¶ 77.

We give substantial weight to Dr. Cooperstock’s testimony that using the switch in the electronic device to change its mode of operation with respect to charging “is similar to the ’077 patent’s embodiment of using a switch to change between on/off modes” and that “[t]hese paradigms are analogous and not materially distinct within the broad scope of” the claim limitation, “which does not recite any specifics relating to activation/deactivation.” *Id.* (citing Ex. 1001, 18:13–18 (broadly describing the switching device applied to the magnetic switch to activate or deactivate the portable electronic device, but not describing what is meant by activation or deactivation, e.g., which elements are affected in the electronic device)). We disagree with Patent Owner (Sur-Reply 29) that Petitioner presents a new theory “that merely closing Lee’s switch 470 activates the ‘electronic

device” as the Petition included this showing. Pet. 34–35. For all of the above reasons, Petitioner’s first and second alternative showings sufficiently account for the claim 1 limitation that “the portable switching device is configured to activate, deactivate or send into hibernation the portable electronic device.”

j. Claim 1: “the electronic device plays, pauses and/or changes the volume of a remote device”

For the above limitation, Petitioner contends that Gundlach discloses that its wireless headset (electronic device) includes a transceiver for sending and receiving information from a host device, such as a media player. Pet. 38 (citing Ex. 1005 ¶ 58). Petitioner asserts, and we agree, that Gundlach’s “disclosure of ‘sending’ information from a wireless headset to a **remote** media-player host **device** would have suggested to a POSITA that the headset (**electronic device**) is operable to issue **play/pause** controls to the media player (**remote device**).” *Id.* at 38–39 (citing Ex. 1003 ¶¶ 83–88; Ex. 1005 ¶¶ 3, 81; Ex. 1007 ¶¶ 6, 7, 36; Exs. 1034, 1039). Other than arguing that a POSITA would not be motivated to combine Gundlach and Lee, which we address above, Patent Owner does not contest Petitioner’s showing as to the above limitation. PO Resp. 53.

k. Claim 1: “the switching device includes a lid and hinge attaching the lid to the switching device”

For the above limitation, Petitioner contends, and we agree, that Gundlach teaches a clamshell charging case (switching device) with opposing cover sections (lids) attached by a hinge. Pet. 39–40 (citing Ex. 1005 ¶ 80, Figs. 18a–18b; Ex. 1003 ¶ 89). Other than arguing that a POSITA would not be motivated to combine Gundlach and Lee, which we

address above, Patent Owner does not contest Petitioner's showing as to the above limitation. PO Resp. 53.

l. Claim 1: "the lid is recessed to configure to the electronic device"

For this limitation, Petitioner argues, and we agree, that Gundlach teaches a clamshell charging case with opposing cover sections (lids) and that each lid includes a recess that accommodates (configures to) the wireless headset (electronic device), resulting in "two independent bases for finding" the limitation satisfied. Pet. 40–41 (citing Ex. 1005 ¶ 80, Figs. 18a–18b; Ex. 1003 ¶ 90).

Besides arguing that a POSITA would not be motivated to combine Gundlach and Lee, which we address above, Patent Owner argues that "Gundlach has a beveled earpiece" and a "flat/planar interior lid." PO Resp. 53. Patent Owner argues that "a POSITA would not understand the flat clamshell case lid to be configured to the beveled earpiece." *Id.* (citing Ex. 2022 ¶ 208). Dr. Toliyat testifies the same. Such arguments and evidence do not undermine Petitioner's persuasive showing, because neither Patent Owner nor Dr. Toliyat explain why Patent Owner's implicit claim construction of "recessed to configure to the electronic device" to mean that the recess must completely conform to the exact shape of the electronic device is warranted. In other words, Patent Owner's arguments are not commensurate in scope with the claim language which only requires that the lid be "recessed to configure to the electronic device," which Gundlach describes. Ex. 1005 ¶ 80, Figs. 18a–18b; Ex. 1003 ¶ 90 (explaining that the cover section (lid) provides a recess that accommodates (configures to) the thickness of the wireless headset). We agree with Petitioner that "Patent

Owner seeks to narrow a facially broad limitation without support in the intrinsic record.” Pet. Reply 24–25.

With respect to Petitioner’s showing that the other cover section meets the limitation (Pet. 40–41), Patent Owner argues that the “base” of the clamshell case is not a lid, and if it were deemed a lid, then Petitioner’s “analysis of dependent claims based upon the lid highlighted above being the lid [shown in PO Resp. as the “top” of the clamshell case highlighted in yellow] would be invalid and further lacking in merit.” PO Resp. 54 (citing Ex. 2022 ¶ 208). Dr. Toliyat’s testimony that the base of the clamshell case is not a lid is not entitled to substantial weight because he does not explain why the bottom cover is not a lid. We agree with Petitioner that nothing in the ’077 patent limits the term “lid” to a covering on the topside of the case, nor does the patent exclude a case with two lids. Pet. Reply 25.

m. Claim 1: “when coupled, the first case functions to protect the second case”

For this limitation, we agree with Petitioner’s contentions that the Gundlach-Lee clamshell charging case comprises a first case and the wireless headset comprises a second case and that the clamshell case (first case) protects the second case. Pet. 41–42 (citing Ex. 1003 ¶¶ 91–93; Exs. 1040, 1041). Other than arguing that a POSITA would not be motivated to combine Gundlach and Lee, which we address above, Patent Owner does not contest Petitioner’s showing as to the above limitation. PO Resp. 54.

For the above reasons, having considered Petitioner’s and Patent Owner’s arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claim 1 of the ’077 patent would have been obvious over the combination of Gundlach and Lee.

n. Dependent claims 2, 8, 9, and 11

Claim 2 depends from claim 1 and recites “wherein the switching device has a first lens.” Petitioner contends, and we agree, that Gundlach discloses an indicator light that a POSITA would have understood to be a lens-equipped light emitting diode (LED) or that it would have been obvious to implement an LED with a lens to provide the indicator light suggested by Gundlach. Pet. 42–43 (citing Ex. 1005 ¶ 80; Ex. 1003 ¶¶ 95–97). Petitioner alternatively argues that Gundlach discloses an embodiment featuring a cradle integrated with a host flip-phone, and flip-phones were known at the time of the invention to include cameras with lenses. *Id.* at 43 (citing Ex. 1005 ¶¶ 56, 58, 78, 79, Figs. 17b, 17c; Ex. 1003 ¶ 98; Ex. 1046). Petitioner provides persuasive reasons for modifying the Gundlach clamshell case with a flip-phone that has a camera. *Id.* at 43–44. Patent Owner does not contest Petitioner’s showing as to the above limitation. PO Resp. 54–55. We are persuaded by Petitioner’s showing for claim 2, which we adopt.

Claim 8 depends from claim 2 and recites “wherein the second case is configured to be nonabrasive to the first lens.” Petitioner contends, and we agree, that Gundlach’s wireless headset (electronic device with second case) is depicted as having smooth surfaces, which a POSITA would have been motivated to manufacture using nonabrasive plastic. Pet. 44–45 (citing Ex. 1003 ¶ 100; Ex. 1049). Patent Owner does not contest Petitioner’s showing as to the above limitation. PO Resp. 55. We are persuaded by Petitioner’s showing for claim 8, which we adopt.

Claim 9 depends from claim 1 and recites “wherein the first magnet is employed in actuating the electronic circuit.” Petitioner refers back to its showing for claim 1 element [b] and claim 1 element [e] that a POSITA would have been motivated to incorporate embedded magnets into the

clamshell case and headset for the purpose of securing the headset in the case, assisting users with fitting the headset into the case, and boosting the consistency and efficiency of the inductive charging process. Pet. 45. Petitioner further contends, and we agree, that a POSITA would have understood a first magnet embedded in a wireless headset that facilitates inductive charging is employed in actuating the electronic battery circuit of the wireless headset during inductive charging. *Id.* at 45–46 (Ex. 1003 ¶ 102; Ex. 1100 ¶ 66). Beyond making arguments that we have addressed already; Patent Owner does not make any specific arguments regarding the limitations of claim 9. PO Resp. 55. We are persuaded by Petitioner’s showing for claim 9, which we adopt.

Claim 11 depends directly from claim 1 and recites “wherein the electronic device is wireless earplugs.” Petitioner argues that Gundlach discloses a wireless headset with an earpiece that, like an earplug, is “inserted into an ear, such as the tragus slot, [and] may deform from a first geometry . . . into a second geometry . . . [that] may conform to an ear canal, sealing . . . the earpiece in the ear to achieve improved sound characteristics or improved retention with the ear.” Pet. 46 (quoting from Ex. 1005 ¶ 63; Ex. 1003 ¶ 103). Petitioner argues to the extent Gundlach’s disclosure of an earpiece that conforms to an ear canal and seals in the ear fails to meet the “earplug” limitation, claim 11 “is no less obvious.” *Id.* This is so, Petitioner argues, and we agree, because a “POSITA would have been motivated to modify Gundlach’s earpiece to seal deep in the user’s *ear* canal to fully **plug** the canal,” since doing so “would have yielded the predictable benefit of configuring Gundlach’s wireless headset for use in particularly noisy environments.” *Id.* at 46–47 (citing Ex. 1003 ¶¶ 104–105; Exs. 1064–1066). Lastly, Petitioner argues that claim 11 “pairs the singular form of **electronic**

device with the plural form of *wireless earplugs*.” *Id.* at 47. Petitioner argues, and we agree, that whether the claim is interpreted to include one wireless earplug or multiple wireless earplugs, Gundlach’s disclosure teaches or suggests either arrangement. *Id.* (citing Ex. 1005 ¶ 82, Figs. 18a–18b; Ex. 1003 ¶¶ 106–107; Ex. 1050; Ex. 1051).

Besides arguing that a POSITA would not be motivated to combine Gundlach and Lee, which we address above, Patent Owner argues that “[e]xpanding the size to the Gundlach clamshell case design to accommodate a second earpiece would make it impossible to then fit this significantly larger clamshell case, now holding two earpieces, into an expansion slot,” and would also add to power loss and “deplete the clamshell battery 30% faster.” PO Resp. 56–57 (citing Ex. 2022 ¶¶ 212–213). These arguments do not undermine Petitioner’s showing for reasons already discussed above regarding alleged size limitations and inefficiencies of using inductive charging. *See also* Pet. Reply 25–26 (explaining the same). Accordingly, for all of the above reasons, we are persuaded that Petitioner has sufficiently accounted for claim 11.

For the above reasons, having considered Petitioner’s and Patent Owner’s arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claims 2, 8, 9, and 11 of the ’077 patent would have been obvious over Gundlach and Lee.

E. Asserted Obviousness of Claims 2 and 8 over Gundlach, Lee, and Nishikawa

Petitioner contends that claims 2 and 8 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, and Nishikawa. Pet. 48–50.

1. Nishikawa

Nishikawa describes a lens-equipped light-emitting diode device which extracts light from a light-emitting diode through a lens. Ex. 1059 ¶ 3.

Figure 1 is illustrative and is reproduced below.

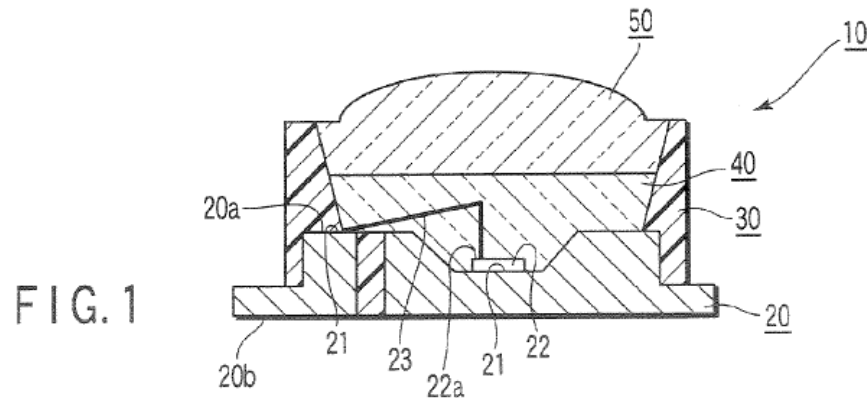


Figure 1 shows a longitudinal sectional view of a lens-equipped light-emitting diode device. *Id.* ¶ 17. Lens-equipped light-emitting diode device 10 has lead frame 20, outer peripheral unit 30, sealing portion 40, and lens unit 50. *Id.* ¶ 30. According to Nishikawa, its lens-equipped light-emitting diode device “is excellent in the light extraction efficiency and the reliability, and the production cost can be reduced.” *Id.* ¶ 38.

2. Discussion

Claim 2 depends directly from claim 1 and recites “wherein the switching device has a first lens.” Claim 8 depends from claim 2 and recites “wherein the second case is configured to be nonabrasive to the first lens.” Petitioner argues that claims 2 and 8 would have been obvious over Gundlach, Lee, and Nishikawa. Pet. 48–50. Petitioner argues, and we agree, that it would have been obvious to modify the Gundlach-Lee clamshell case with Nishikawa’s lens-equipped LED indicator light and that

a “POSITA would have been motivated to use Nishikawa’s design to leverage the stated benefits of ‘excellent ... light extraction efficiency and reliability’ with reduced ‘production cost[s].’” *Id.* at 49 (citing Exs. 1042–1044, 1062, 1063; Ex. 1003 ¶ 109; Ex. 1059 ¶ 3). Petitioner also provides a sufficient showing for claim 8, referring back to its previous showing for claim 8. *Id.* at 50. Other than arguing that a POSITA would not be motivated to combine Gundlach and Lee, which we have addressed, Patent Owner does not separately argue claims 2 and 8 for this ground. PO Resp. 57–58.

For the above reasons, having considered Petitioner’s and Patent Owner’s arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claims 2 and 8 of the ’077 patent would have been obvious over Gundlach, Lee, and Nishikawa.

F. Asserted Obviousness of Claim 11 over Gundlach, Lee, and Rosener

Petitioner contends that claim 11 is unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, and Rosener. Pet. 50–53.

1. Rosener

Rosener describes wireless earphones. Ex. 1050 ¶ 1. The earphone comprises a housing containing a speaker, an RF receiver or transceiver, and a battery. *Id.* at ¶ 30. The earphone “may be in the form of an earbud” or “a canalphone, which can be fitted within the ear canal of the user’s ear.” *Id.*

2. Discussion

Claim 11 depends directly from claim 1 and recites “wherein the electronic device is wireless earplugs.” Petitioner argues that claim 11 would have been obvious over Gundlach, Lee, and Rosener. Pet. 50–53.

Petitioner argues, and we agree, that to the extent that the Gundlach-Lee headset is not “wireless” (e.g., without a wire between the earpieces), it would have been obvious to combine Gundlach and Lee with “Rosener’s teachings to provide a Bluetooth stereo headset having two wireless earpieces that are also not wired together” to eliminate an additional wire. *Id.* at 51–52. Patent Owner’s arguments are the same as those presented above with respect to the asserted obviousness of claim 11 over Gundlach and Lee, which we have addressed. POREsp. 58–59.

For the above reasons, having considered Petitioner’s and Patent Owner’s arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claim 11 of the ’077 patent would have been obvious over Gundlach, Lee, and Rosener.

G. Asserted Obviousness of Claims 3 and 7 over Gundlach, Lee, and Brown

Petitioner contends that claims 3 and 7 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, and Brown. Pet. 53–58.

1. Brown

Brown describes a headset user interface input mechanism with an optical line scanner that detects finger movements that can be translated into various inputs. Ex. 1008, 2:1–9.

Figure 1 is illustrative and is reproduced below.

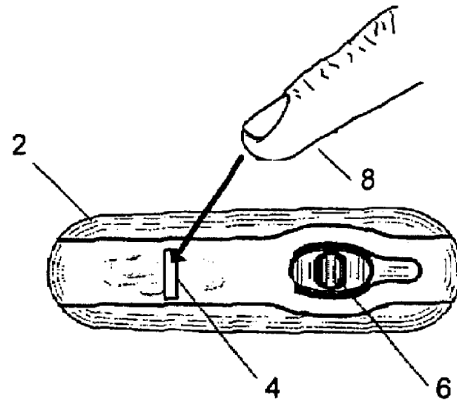


Figure 1 shows a headset that is capable of receiving user inputs via an optical line scanner. *Id.* at 1:39–40. Headset 2 has finger pad 4 that is optically transparent, and a lens for focusing light on an optical sensor. *Id.* at 3:14–18, 4:18–23. Light reflected off finger pad 4 forms an image of a user finger and the image is captured by the optical sensor. *Id.* at 4:35–37. Successive images of a finger placed on finger pad 4 are compared by a processor to determine motions of the finger which are then translated to a user command. *Id.* at 4:39–52.

2. Discussion

Claim 3 depends directly from claim 1 and recites “wherein the electronic device has a second lens.” Claim 7 depends from claim 3 and recites “wherein the first case is configured to be nonabrasive to the second lens.” Petitioner argues claims 3 and 7 would have been obvious over Gundlach, Lee, and Brown. Pet. 53–58. For claim 3, Petitioner argues, and we find, that Brown teaches a headset with a “finger pad” and “line scanner” that includes a lens (second lens), to facilitate touch-based user inputs. *Id.* at 56–57 (citing Ex. 1008, 3:23–30; Ex. 1003 ¶ 125).

For claim 7, Petitioner argues, and we agree, that “[a]s a POSITA would have understood, the *lens* in Brown’s ‘line scanner’ is disposed

within the housing of the headset and would not contact the clamshell *case*.” *Id.* at 57–58 (citing Ex. 1003 ¶ 127; Ex. 1008, 4:18–23). Petitioner further argues, and we agree, that “[r]ecognizing that abrasion requires physical contact, the POSITA would have understood that in the Gundlach-Lee-Brown combination, the clamshell **(first) case is configured to be non-abrasive to the second lens** within the headset.” *Id.* at 58 (citing Ex. 1003 ¶ 127; Ex. 1058). Alternatively, for claim 7, Petitioner argues, and we agree, that a “POSITA would have been motivated to manufacture the clamshell **(first) case** with smooth plastic surfaces, which are known to be **nonabrasive**.” *Id.* (citing Ex. 1003 ¶ 128; Ex. 1049; Ex. 1100 ¶ 65).

Patent Owner argues that Brown is not “analogous art to the ’077 patent.” PO Resp. 59. Patent Owner contends that “[t]he only apparent analogy is that the electronic device of the ’077 patent can be wireless earplugs and Brown pertains to a specific variety of wireless earbuds with optical user interfaces.” *Id.* (citing Ex. 2022 ¶ 224¹⁷). Patent Owner contends that the field of endeavor of the ’077 patent is “magnetic switching devices that activate, deactivate or hibernate an electronic device” and the “field of endeavor for Brown is a very specific, optical user interface for headsets.” *Id.* at 59–60. Patent Owner also contends that a POSITA would not “understand Brown’s disclosure to be reasonably pertinent to problems encountered by the ’077 inventor.” *Id.*

The test for determining whether a prior art reference constitutes analogous art to the claimed invention is “(1) whether the [prior] art is from

¹⁷ We understand Patent Owner’s citations to various paragraphs of Dr. Toliyat’s declaration for this ground to contain several typographical errors. We present citations we believe were intended by considering the context of the assertions.

the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” See *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). “Prior art is analogous if it is from the same field of endeavor or if it is reasonably pertinent to the particular problem the inventor is trying to solve.” *Circuit Check Inc. v. QXQ Inc.*, 795 F.3d 1331, 1335 (Fec. Cir. 2015). A reference is analogous art if either of these two tests is met. *Scientific Plastic Prods., Inc. v. Biotage AB*, 766 F.3d 1355, 1359 (Fed. Cir. 2014). The Federal Circuit has indicated that the scope of analogous art is to be construed broadly. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (“The Supreme Court’s decision in *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398 . . . (2007), directs us to construe the scope of analogous art broadly . . .”).

In determining the field of endeavor, we look to the ’077 patent’s written description and claims, including the structure and function of the invention. *Bigio*, 381 F.3d at 1326. And, we agree with Petitioner that in defining the field of invention, and in determining the relevance of Brown to the obviousness inquiry, here a broad approach should be taken. Pet. Reply 15. Indeed, the Supreme Court provided guidance in determining the applicability of a reference’s teachings in an obviousness inquiry. In *KSR International Co. v. Teleflex Inc.*, the Court explained that if a feature has been used to improve one device, and a person of ordinary skill in the art would have recognized that it would improve a similar device in that field or another, implementing that feature on the similar device is likely obvious. 550 U.S. at 417.

Here, we agree with Petitioner that the appropriate scope of the field of endeavor of the claimed invention is directed to switching devices and electronic devices. Pet. Reply 15 (citing Ex. 1001, 4:8–16, 17:63–65, 21:39–40); PO Resp. 59–60 (“[t]he field of endeavor of the ’077 patent is, broadly, speaking, magnetic switching devices that activate deactivate or hibernate an electronic device”). We further agree with Petitioner that “Brown’s headset falls into the general descriptive category of ‘electronic device.’” Pet. Reply 15. Patent Owner fails to show sufficiently that Brown is not within the same field of endeavor as the ’077 patent. PO Resp. 59. Although Brown may describe optical user interfaces for headsets, its teachings are relevant to the broad field of endeavor which includes electronic devices such as headsets.

Because we find that Brown is from the same field of endeavor as the claimed invention and provides relevant teachings to a person of ordinary skill in the art at the time of the invention, we need not consider Patent Owner’s arguments regarding whether Brown is reasonably pertinent to the particular problem with which the inventors are involved.

Next, Patent Owner argues that Petitioner is “using hindsight reconstruction to advocate drastically modifying Gundlach’s headset with Brown’s optical headset user interface, merely for the reason of supplying a lens on the headset.” PO Resp. 60 (citing Ex. 2022 ¶ 225). Patent Owner further argues that a POSITA “would not have the knowledge, experience, or expertise to implement Brown’s highly complex optical scanning system” and that a POSITA would not have been motivated “to dramatically increase the cost and complexity of Gundlach’s headsets to add Brown’s optical user interface.” *Id.* (citing Ex. 2022 ¶¶ 226–227).

In support of Patent Owner’s arguments, Dr. Toliyat testifies the same. Ex. 2022 ¶¶ 225–227. Dr. Toliyat’s testimony that Petitioner is using hindsight merely for the reason of supplying a lens on the headset is not entitled to substantial weight, because Dr. Toliyat fails to consider Dr. Cooperstock’s testimony, which we determine is reasonable. For instance, Dr. Cooperstock explains that a POSITA would have “viewed Brown’s touch-based user interface, and all of its advantages, as applicable to the wireless headset of Gundlach-Lee” and “that the Gundlach-Lee headset was ripe for improvement in this area as Gundlach’s and Lee’s disclosures are not particularly concerned with the headset’s user interface.” Ex. 1003 ¶ 123. We afford substantial weight to Dr. Cooperstock’s testimony that a POSITA would have known of limitations with headset user interfaces and would have been motivated to provide a user interface like Brown’s on the Gundlach-Lee headset that would have been compatible with enhanced functionality on a headset with limited physical size. *Id.*

Dr. Toliyat further testifies that a POSITA would not have the knowledge, experience, or expertise to implement Brown’s highly complex optical scanning system and would not do so because of the cost and complexity of adding Brown’s interface to Gundlach’s headset. Ex. 2022 ¶¶ 226–227. Dr. Toliyat’s testimony is not entitled to substantial weight because it is conclusory. For example, Dr. Toliyat fails to explain what kind of obstacles the POSITA would have faced incorporating Brown’s finger pad and line scanner into the Gundlach-Lee device. We afford substantial weight to Dr. Cooperstock’s testimony that a POSITA would have been able to include a finger pad and line scanner, like those taught by Brown, to the Gundlach-Lee device and that doing so “would have been entirely predictable to a POSITA and implemented with merely routine skill”

because his testimony is supported by record evidence. Ex. 1003 ¶¶ 20, 122–124 (citing multiple passages from Ex. 1008).

For the above reasons, having considered Petitioner’s and Patent Owner’s arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claims 3 and 7 of the ’077 patent would have been obvious over Gundlach, Lee, and Brown.

H. Asserted Obviousness of Claims 4, 5, 10, 12, and 13 over Gundlach, Lee, and Mak-Fan

Petitioner contends that claims 4, 5, 10, 12, and 13 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, and Mak-Fan. Pet. 58–65.

1. Mak-Fan

Mak-Fan describes holsters for portable handheld wireless communication devices. Ex. 1010 ¶ 1. Mak-Fan indicates that “[i]t is known to have a magnet in the holster, with a Hall effect sensor in the device, so that either the device is turned off in response to the device being placed in the holster and the sensor aligning with the magnet, or at least certain functions are disabled.” *Id.* ¶ 2. In one embodiment, an electronic device has a Hall effect sensor and a holster has a magnet positioned to align with the sensor when the electronic device is fully holstered. *Id.* ¶ 14. “The device is programmed so that when the Hall effect sensor detects the magnet, the device is disabled, or at least certain elements thereof are disabled.” *Id.* The holster can have a fold-over flap that has a metal element to engage a magnet of the holster to hold down the flap in a closed position. *Id.* ¶ 19.

2. Discussion

Claim 4 depends from claim 1 and recites “wherein the lid has a second magnet disposed within it.” Petitioner proposes replacing snap elements in Gundlach’s clamshell case (Figures 18a–18b) with Mak-Fan’s magnet that would have resulted, and we agree, as “nothing more than the simple substitution of one known closure element for another to achieve an exceedingly predictable result.” Pet. 60 (citing Ex. 1003 ¶ 132). Petitioner contends, and we agree, that a “POSITA would have known that magnetic closures can be easier for users to operate than snap closures” and are “less susceptible to fatigue failure modes.” *Id.* at 61 (citing Ex. 1003 ¶ 133; Ex. 1054). Petitioner further contends, and we agree, that a POSITA would have considered Mak-Fan’s magnetic closure to be an obvious variant of Gundlach’s snap closure because magnetic closures were among a limited number of solutions for retaining a clamshell case. *Id.* (citing Ex. 1003 ¶ 133; Ex. 1055). Petitioner asserts, and we agree, that a “POSITA would have been motivated to integrate Mak-Fan’s teachings with Gundlach-Lee to produce a clamshell case with a **(second) magnet** installed on one of the protective **lids** and a piece of metal in the other lid.” *Id.* at 62–63 (citing Ex. 1003 ¶¶ 134–135; Ex. 1010 ¶ 2). Petitioner further asserts, and we agree, that Mak-Fan’s disclosure of a “magnet in the holster” is “sufficient to obviate the [claim 4] requirement of ‘a second magnet disposed within [the lid].” *Id.* at 63 (citing Ex. 1010 ¶ 2; Ex. 1003 ¶ 135).

We address above Patent Owner’s arguments that the Gundlach-Lee combination does not render obvious claim 1. PO Resp. 65. Patent Owner also argues that due to size limitations inherent in the lip of the clamshell case, that Mak-Fan’s “magnetic closure would be significantly less secure

than Gundlach’s mechanical snap fastener” and “make it more likely that Gundlach’s headset would be damaged if the clamshell case was dropped.” *Id.* at 62–63 (citing Ex. 2022 ¶¶ 232–233¹⁸). Patent Owner argues that as a result, a POSITA would not have been motivated to replace Gundlach’s secure fastener with a less secure magnetic fastener. *Id.* at 63–64 (citing Ex. 2022 ¶¶ 233–235). Patent Owner further argues that Petitioner’s showing is “premised upon [the] mistaken belief that Mak-Fan discloses a magnet in its lid flap,” but, to the contrary, “Mak-Fan discloses a magnet 4 in the main body of its case and metal element 11 in the flap or lid.” *Id.* at 64–65 (citing Pet. 63; Ex. 1010 ¶¶ 14, 19, Figs. 1, 4; Ex. 2022 ¶ 238).

We have considered Patent Owner’s arguments, but determine that they do not undermine Petitioner’s showing. First, we agree with Petitioner that Patent Owner does not respond to Petitioner’s showing that, although magnetic closures provide a lesser closure force compared to a snap closure, magnetic closures can be easier for users to operate than snap closures. Pet. Reply 16–17 (citing Pet. 59–61; Ex. 1003 ¶ 130–133; Ex. 1054). Thus, there would have been an advantage to using magnetic closures as opposed to snap closures. Ex. 1003 ¶ 133; Ex. 1054, 1–2 (describing that magnetic closures provide design incentives for “easy-to-open devices, and strong repeat closure technologies”). As Petitioner correctly points out, “tradeoffs and challenges do not preclude obviousness.” Pet. Reply 17.

We further agree with Petitioner that the “Petition correctly interpreted Mak-Fan as describing an embodiment where ‘[t]he fold-over

¹⁸ Patent Owner makes several typographical errors to citations of the paragraphs of Dr. Toliyat’s declaration. Throughout this discussion, and elsewhere, we present paragraphs from Dr. Toliyat’s declaration that we believe were intended by considering context.

flap includes a metal element engaging a magnet to hold the holster closed,” and that the Petition presents reasons that “a POSITA would have applied this teaching of Mak-Fan’s to modify the Gundlach-Lee clamshell case by installing a magnet on one of the lids and a piece of metal on the other lid.” *Id.* at 26 (citing Pet. 62, 64; Ex. 1010 ¶¶ 14, 19).

Claim 5 depends from claim 4 and recites “wherein the lid is configured to employ the second magnet to secure the lid in a closed position.” Petitioner refers to its showing for claim 5 for meeting the claim 4 limitation, which we determine is sufficient. Pet. 63 (citing Ex. 1003 ¶ 138). Patent Owner’s arguments for claim 5 are the same as the arguments presented for claim 4, which we have addressed. PO Resp. 65–66.

Claim 10 depends from claim 4 and recites “wherein the second or a third magnet is employed in the lid to actuate the electronic circuit.” Petitioner argues, referring back to its showing for claim 4, that the Gundlach-Lee-Mak-Fan combination would have produced a clamshell case with a second magnet disposed within one of the lids for the purpose of maintaining the case in a closed state with the wireless headset secured inside to charge inductively. Pet. 63–64. Petitioner further argues, and we agree, that Mak-Fan teaches a portable device with a Hall effect sensor responsive to a magnet disposed in its case and that detection of the magnet by the sensor signals to the device that it is installed within the case. *Id.* at 64 (citing Ex. 1010 ¶¶ 14, 19; Ex. 1003 ¶ 138). Petitioner contends, and we agree, that a POSITA would have viewed a Hall effect sensor as a suitable solution to Lee’s switch that closes to actuate the battery circuit when positioned near the clamshell case. *Id.* at 64–65 (citing Ex. 1006, 5:30–40; Ex. 1003 ¶ 139; Ex. 1057). Petitioner further contends, and we agree, that a POSITA would have been motivated to employ a Hall effect sensor due to

Mak-Fan’s disclosure of detecting magnets to determine when a device is holstered and because of the known benefits of such sensors (high reliability and durability). *Id.* (citing Ex. 1003 ¶ 139).

Patent Owner argues that in Mak-Fan, the Hall sensor is actuated by a magnet in the body of the holster case, and that the magnet is not in the lid of the case, and that switching the position of the magnet with the metal element would have frustrated the Mak-Fan design. PO Resp. 67–68. As explained above, we agree with Petitioner that the Petition correctly interprets the teachings of Mak-Fan. Pet. Reply 26–27. We further agree with Petitioner that Patent Owner’s arguments of switching magnet 4 and metal element 11 on Mak-Fan’s holster are misplaced, as the “Petition does not propose a modification to Mak-Fan’s holster. Instead, the Petition contends that a POSITA would have applied Mak-Fan’s teachings to the Gundlach-Lee clamshell case.” *Id.* at 26.

Next, Patent Owner argues that a POSITA would not agree with Petitioner’s assertion that Lee does not disclose the implementation details of the switch, because Lee describes switch 470 opening and closing. PO Resp. 68–69 (citing Ex. 2022 ¶ 254; Ex. 1006, 5:12–40). This argument is misplaced since whether Lee describes how switch 470 functions, e.g., to open or close, does not undermine Dr. Cooperstock’s sufficient testimony that while Lee teaches a switch that automatically closes to actuate the battery circuit when positioned near the clamshell case, Lee does not describe the *implementation* details of the switch and that “a POSITA would have viewed the Hall effect sensor described by Mak-Fan as a suitable solution.” Ex. 1003 ¶ 139 (citing Ex. 1057, 2–4 for the proposition that Hall effect sensors were a common solution for presence sensing applications in mobile devices).

Patent Owner further argues that the Gundlach-Lee combination teaches that the earpiece charges automatically when put in proximity to a wireless coil, whether the case is open or closed, but that the “Gundlach-Lee-Mak-Fan combination would not allow the Gundlach earpiece to charge when not placed in a closed clamshell case.” PO Resp. 69–71 (citing Ex. 2022 ¶¶ 255–257). We agree with Petitioner that “there is no dissonance between the combination with Mak-Fan and Lee’s teaching that ‘the switch 470 can sense when the headphone/headset apparatus 460 is near the power adapter [i.e., case], so that it automatically closes to the charge position when near the power adapter,’” because Mak-Fan teaches the use of a Hall effect sensor as a known solution to Lee’s suggestion of sensing proximity, resulting in a combination that does not change Lee’s functionality, but rather enables it. Pet. Reply 27 (citing Ex. 1006, 5:30–34; Pet. 65–66; Ex. 1003 ¶ 139 (citing Ex. 1057)).

Lastly, we find unavailing Patent Owner’s arguments regarding Petitioner’s proposed modifications being incompatible with Gundlach’s intended design of being chargeable inside an expansion slot for a laptop or phone, for reasons already discussed. PO Resp. 70–71.

Claim 12 depends directly from claim 1 and recites “wherein the system further comprises a sensor that can be activated using a magnet.” Petitioner refers to its showing for claim 10 for meeting the claim 12 limitation, which we determine is sufficient. Pet. 65 (citing Ex. 1003 ¶ 140). Patent Owner’s arguments for claim 12 are the same as the arguments presented for claim 10, which we have addressed. PO Resp. 71.

Claim 13 depends from claim 5 and recites “wherein the system further comprises a sensor than can be actuated using a magnet.” Petitioner refers to its showing for claim 10 for meeting the claim 13 limitation, which

we determine is sufficient. Pet. 65 (citing Ex. 1003 ¶ 141). Patent Owner's arguments for claim 12 are the same as the arguments presented for claim 10, which we have addressed. PO Resp. 71–72.

For the above reasons, having considered Petitioner's and Patent Owner's arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claims 4, 5, 10, 12, and 13 of the '077 patent would have been obvious over Gundlach, Lee, and Mak-Fan.

I. Asserted Obviousness of Claims Based on Gundlach, Lee, and Kim

Petitioner contends that: (1) claims 1, 2, 8, 9, and 11 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, and Kim; (2) claims 2 and 8 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Nishikawa; (3) claim 11 is unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Rosener; (4) claims 3 and 7 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Brown; and (5) claims 4, 5, 10, 12, and 13 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Mak-Fan. Pet. 65–70.

1. Kim

Kim describes an apparatus and method for remotely controlling a Bluetooth device executing an application based on Audio Video Remote Control Profile (AVRCP). Ex. 1007 ¶ 3. Kim further describes embodiments that provide for the remote control of functions of a Bluetooth device based on AVRCP through a virtual audio or video streaming connection between the Bluetooth device and a Bluetooth stereo headset. *Id.* ¶ 26.

2. Discussion

Claim 1 recites “the electronic device plays, pauses, and/or changes the volume of a remote device.” Petitioner argues, and we agree, that to the extent Gundlach does not teach this limitation, Kim teaches a wireless headset configured to remotely control a Bluetooth-enabled device such as a smart phone that meets the limitation. Pet. 68–69 (citing Ex. 1007 ¶¶ 34–35, 39–40, 91; Ex. 1003 ¶ 138). Petitioner provides sufficient reasons for combining Gundlach, Lee, and Kim. *Id.* at 66–68 (citing Ex. 1003 ¶¶ 144–147). The challenges to claims 1–5 and 7–13 are otherwise the same as those challenges we discuss above that are without Kim. *Id.* at 65, 69–70. Patent Owner does not separately contest the challenges to claims 1–5 and 7–13 based on the addition of Kim. PO Resp. 72–74.

We have reviewed Petitioner’s challenges based on the addition of Kim and determine that Petitioner has shown by a preponderance of the evidence that: (1) claims 1, 2, 8, 9, and 11 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, and Kim; (2) claims 2 and 8 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Nishikawa; (3) claim 11 is unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Rosener; (4) claims 3 and 7 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Brown; and (5) claims 4, 5, 10, 12, and 13 are unpatentable under 35 U.S.C. § 103(a) as obvious over Gundlach, Lee, Kim, and Mak-Fan.

III. CONCLUSION¹⁹

For the foregoing reasons, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–5 and 7–13 of the '077 patent are unpatentable, as summarized in the following table:

Claims	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 8, 9, 11	103(a)	Gundlach, Lee	1, 4–7, 10, 14–16, 19	
2, 8	103(a)	Gundlach, Lee, Nishikawa	2, 8	
11	103(a)	Gundlach, Lee, Rosener	11	
3, 7	103(a)	Gundlach, Lee, Brown	3, 7	
4, 5, 10, 12, 13	103(a)	Gundlach, Lee, Mak-Fan	4, 5, 10, 12, 13	
1, 2, 8, 9, 11	103(a)	Gundlach, Lee, Kim	1, 2, 8, 9, 11	
2, 8	103(a)	Gundlach, Lee, Kim, Nishikawa	2, 8	
11	103(a)	Gundlach, Lee, Kim, Rosener	11	
3, 7	103(a)	Gundlach, Lee, Kim, Brown	3, 7	
4, 5, 10, 12, 13	103(a)	Gundlach, Lee, Kim, Mak-Fan	4, 5, 10, 12, 13	

¹⁹ 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. 16654 (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).

Overall Outcome			1, 2, 4–10, 12, 14–17, 19	
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IV. ORDER

Accordingly, it is:

ORDERED that claims 1–5 and 7–13 of the '077 have been shown to be unpatentable; and

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

IPR2021-00472
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