

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALIVECOR, INC.,
Petitioner

v.

APPLE INC.,
Patent Owner

Case No. IPR2023-00950
U.S. Patent No. 10,076,257

PATENT OWNER'S NOTICE OF APPEAL

Patent Owner Apple Inc. hereby provides notice of its appeal to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board entered on December 23, 2024, in IPR2023-00950 (Paper No. 44), and from all underlying findings, determinations, rulings, opinions, orders, issues, and decisions regarding the *inter partes* review of U.S. Patent No. 10,076,257 (the “ ’257 patent”). *See* 35 U.S.C. §§ 141–142, 319; 37 C.F.R. §§ 90.2–90.3; Fed. R. App. P. 15; Fed. Cir. R. 15. This notice is timely under 37 C.F.R. § 90.3, having been filed no later than 63 days after the Final Written Decision.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Apple states that the issues on appeal include, but are not limited to: the Board’s determination that Petitioner AliveCor, Inc., had demonstrated by a preponderance of the evidence that claims 19–22 of the ’257 patent are unpatentable.

This notice is being electronically filed with the clerk’s office for the United States Court of Appeals for the Federal Circuit, along with payment of the required docketing fee. In addition, a true and correct copy of this notice is being filed simultaneously with the Director of the United States Patent and Trademark Office.

Dated: May 27, 2025

Respectfully submitted,

/Patrick J. Bisenius/

Patrick J. Bisenius, Reg. No. 63,893

Fish & Richardson P.C.

60 South Sixth Street

Minneapolis, MN 55402

T: (612) 766-2048

F: (877) 769-7945

CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on May 27, 2025, a complete and entire copy of this Patent Owner's Notice of Appeal was provided via email to the Petitioner by serving the correspondence address of record as follows:

Christopher TL Douglas, Reg. No. 56,950
Scott M. Stevens, Reg. No. 54,762
Philip Ducker, *Pro Hac Vice*
J. Ravindra Fernando, Reg. No. 73,762
Thomas F. Finch, *Pro Hac Vice*
Erin Beaton, Reg. No. 79,218

ALSTON & BIRD LLP
Vantage South End
1120 South Tryon Street, Suite 300
Charlotte, NC 28203-6818
Phone: 704.444.1000
Fax: 704.444.1111
E-mail: apple-alivecor-ndcal@alston.com

Pursuant to 37 C.F.R. § 90.2(a)(1), I hereby certify that in addition to being filed electronically through the Board's P-TACTS System, this Patent Owner's Notice of Appeal is being provided to the Director of the USPTO on May 27, 2025, by electronically filing to the email address as follows:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
efileSO@uspto.gov

I hereby certify that on May 27, 2025, a true and correct a copy of the foregoing Patent Owner's Notice of Appeal, along with a copy of the Final Written Decision, was filed electronically with the Clerk's Office of the United States Court of Appeals for the Federal Circuit, at the following address:

United States Court of Appeals for the Federal Circuit
717 Madison Place, N.W., Suite 401
Washington, DC 20005

Dated: May 27, 2025

Respectfully submitted,

/Patrick J. Bisenius/

Patrick J. Bisenius, Reg. No. 63,893
Fish & Richardson P.C.
60 South Sixth Street
Minneapolis, MN 55402
T: (612) 766-2048
F: (877) 769-7945

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALIVECOR, INC.,
Petitioner,

v.

APPLE INC.,
Patent Owner.

IPR2023-00950
Patent 10,076,257 B2

Before KEN B. BARRETT, JOSIAH C. COCKS, and
ROBERT L. KINDER, *Administrative Patent Judges*.

COCKS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
Dismissing Patent Owner's Revised Contingent Motion to Amend
35 U.S.C. § 318

I. INTRODUCTION

A. *Background and Summary*

AliveCor, Inc. (“Petitioner” or “AliveCor”)¹ filed a Petition requesting *inter partes* review of claims 1–22 of U.S. Patent No. 10,076,257 B2 (“the ’257 patent,” Ex. 1001). Paper 2 (“Pet.”). Apple Inc. (“Patent Owner” or “Apple”)² filed a Preliminary Response to the Petition. Paper 6. As was authorized by the panel, Petitioner filed a Preliminary Reply to the Preliminary Response (Paper 8), and Patent Owner filed a Preliminary Sur-reply (Paper 11). We instituted the petitioned review (Paper 12).

After institution, Patent Owner filed a Patent Owner Response (Paper 20, “PO Resp.”) to oppose the Petition. Petitioner filed a Reply (Paper 25, “Pet. Reply”) to the Patent Owner Response. Patent Owner filed a Sur-reply (Paper 28, “PO Sur-reply”) to the Reply. On October 15, 2024, the Board issued a final written decision in a related proceeding involving the ’257 patent. *See Masimo Corp. v. Apple Inc.*, IPR2023-00745, Paper 44 (“the 745 IPR”). In light of that decision, we authorized the parties to submit supplemental claim construction briefing concerning the terms “embedded” and “embedded in” that were at issue in the 745 IPR. *See* Paper 37. Both parties submitted briefing in that respect. *See* Papers 39 (Patent Owner’s Supplemental Claim Construction Briefing (“PO Supp. Br.”)), 40 (Petitioner’s Supplemental Claim Construction Briefing (“Pet. Supp. Br.”)).

¹ Petitioner identifies AliveCor, Inc. as the real party-in-interest. Pet. 95.

² Patent Owner identifies Apple Inc. as the real party-in-interest. Paper 3 ¶ 1 (Patent Owner’s Mandatory Notices).

Patent Owner additionally filed a Contingent Motion to Amend (Paper 19), which was followed by Petitioner's Response (Paper 24). We issued Preliminary Guidance on that Contingent Motion to Amend. Paper 26. Patent Owner subsequently filed a Revised Contingent Motion to Amend (Paper 29), which was followed by Petitioner's Opposition to that Motion (Paper 32), Patent Owner's Reply (Paper 36), and Petitioner's Sur-reply (Paper 38).

We conducted an oral hearing on November 5, 2024. A transcript has been entered into the record (Paper 43, "Tr.").

We have jurisdiction under 35 U.S.C. § 6(b)(4) and § 318(a). This Decision is a final written decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of claims 1–22 of the '257 patent. We determine Petitioner has not shown by a preponderance of the evidence that claims 1–14 claims are unpatentable, but has shown by a preponderance of the evidence that claims 15–22 are unpatentable. We dismiss as moot Patent Owner's Revised Contingent Motion to Amend.

B. Related Proceedings

Both parties identify, as a matter involving the '257 patent, *Apple Inc. v. AliveCor, Inc.*, Case No. 4:22-cv-07608-HSG (N.D. Cal.) ("the co-pending Litigation"). Pet. 95; Paper 3 ¶ 2. Both parties also identify *Apple Inc. v. Masimo Corporation and Sound United, LLC*, No. 1:22-cv-01378-MN (D. Del.) as a matter involving the '257 patent. Paper 3 ¶ 2; Paper 9, 1 (Petitioner's Second Updated Mandatory Notices).

Petitioner identifies the following related PTAB proceedings involving the '257 patent:

- *Masimo Corp. v. Apple Inc.*, IPR2023-00745 (final written decision issued on Oct. 15, 2024, Paper 44);
- *Masimo Corp. v. Apple Inc.*, IPR2024-00071 (institution denied on Apr. 25, 2024, Paper 7);
- *AliveCor, Inc. v. Apple Inc.*, IPR2024-00169 (terminated pre-institution on Feb. 7, 2024, Paper 9).

See Paper 9, at 1.

C. The '257 Patent

The '257 patent is titled “Seamlessly Embedded Heart Rate Monitor” and “is directed to an electronic device having an integrated sensor for detecting a user’s cardiac activity and cardiac electrical signals.” Ex. 1001, codes (54), (57). The '257 patent’s “seamlessly integrated cardiac sensor . . . can be integrated in any suitable portion of the electronic device” including “a portion with which the user is typically in contact (e.g., an input mechanism or a housing held by the user), or metallic or conductive portions of the device.” *Id.* at 2:6–13. The '257 patent illustrates, in Figure 1 (reproduced below), a schematic view of an electronic device for receiving the output of one or more sensors, and in Figure 3 (reproduced below), a schematic view of the elements (including integrated leads) of the electronic device. *Id.* at 3:22–24, 3:27–29.

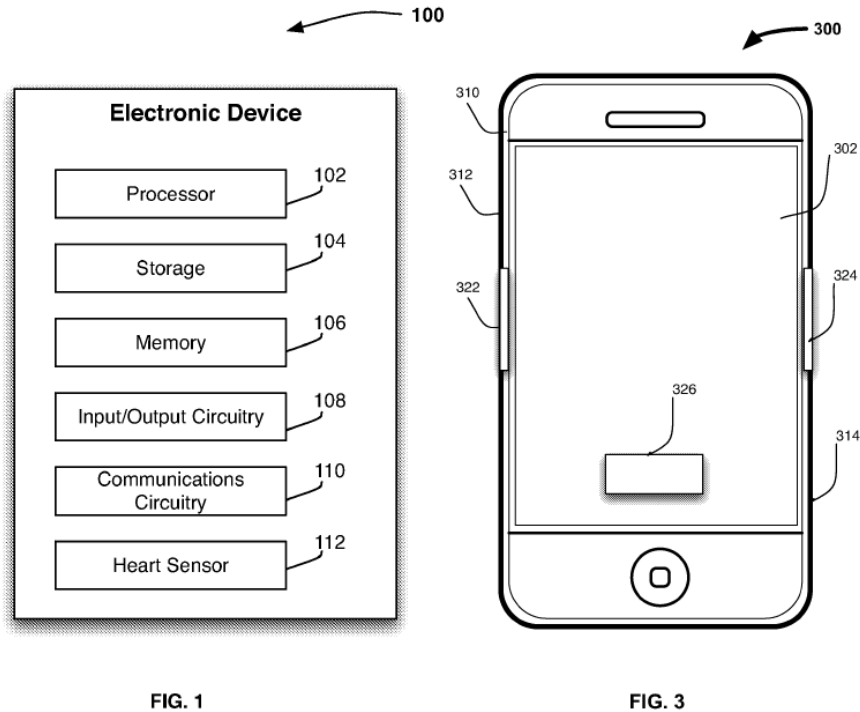


Figure 1 is a schematic view of an electronic device 100 for receiving the output of one or more sensors, and Figure 3 is a schematic view illustrating an electronic device 300 having several integrated leads. *Id.* at 3:47–49, 8:13–16. As shown in Figure 1, the electronic device includes control circuitry 102, storage 104, memory 106, input/output circuitry 108, communications circuitry 110, and heart sensor 112. *Id.* at 3:49–52. Control circuitry 102 includes processing circuitry or a processor operative to control the operations and performance of electronic device 100. *Id.* at 3:62–63. The control circuitry may be used to run operating system applications, firmware applications, media playback applications, media editing applications, and may also drive a display and process inputs received from a user interface. *Id.* at 3:64–4:2. Heart sensor 112 is operative to detect a user's heartbeat, heart rate, or other signal generated by the user's heart. *Id.* at 6:3–5. Thus, heart sensor 112 may serve as an EKG monitor. *Id.* at 6:5–6. Heart sensor 112 may include lead(s) connected to

the exterior of the electronic device such that the user may contact one or more of the leads to provide an electrical signal associated with the user's heart to heart sensor 112. *Id.* at 6:6–10. Cardiac signals detected by the heart sensor leads are analyzed by the processor, which generates, from the received signals, one or more characteristic quantities of the user's heartbeat or heart rate for authentication. *Id.* at 6:10–16. The leads may be integrated in any suitable portion of the electronic device. *Id.* at 8:11–13. Figure 3 illustrates an electronic device having such integrated leads. *Id.* at 8:13–15.

Electronic device 300 illustrated in Figure 3 includes display 302 and bezel 310, and is portable such that a user can hold the electronic device with fingers extending against one of sides 312 and 314 of bezel 310, and the user's thumb extending against the other of sides 312 and 314. *Id.* at 8:15–20. Leads 322 and 324, which may include conductive pads, may be coupled to sides 312 and 314 of bezel 310, respectively, such that when the user holds the device, the user's thumb and fingers are placed in contact with leads 322 and 324. *Id.* at 8:20–24. Alternatively, bezel 310 may include any other suitable number of leads, or any other suitable distribution of leads along bezel 310 and in other portions of electronic device 300. *Id.* at 8:24–27. The leads detect the user's cardiac activity through the contact with the user's thumb and fingers, and provide the detected activity to the electronic device processor for processing. *Id.* at 8:27–30.

Electronic device 300 may also include additional lead 326 embedded in or behind display 302, as shown in Figure 3. *Id.* at 8:40–42. Lead 326 is operative to detect a user's heart activity as the user moves a finger across display 302, for example in the vicinity of or directly over lead 326 (e.g., as the user drags a finger over lead 326 to move a slider when unlocking the

electronic device). *Id.* at 8:42–46. Using lead 326, the electronic device can detect an electrical signal from a different portion of the user's body (e.g., leads 322 and 324 detect signals through a first hand, and lead 326 detects signals through the second hand), which can provide the processor with additional information for determining characteristics of the user's cardiac activity. *Id.* at 8:46–52.

To prevent leads 322, 324 and 326 from shorting, electronic device 300 may include at least one non-conductive component positioned between each of leads 322, 324 and 326: for example, a rubber gasket can be positioned between leads 322 and 324 (in bezel 310) and lead 326 (in display 302). *Id.* at 8:53–58. The cardiac electrical signals detected by leads 322, 324, and 326 may be faint or have particular characteristics that require materials having particular properties (e.g., silver-based compounds) to detect and transmit. *Id.* at 8:58–62. In such cases, although the material used for bezel 310 or other electronic device components can be conductive, its conductivity can be insufficient to transmit signals detected by lead 322 directly to lead 324 (e.g., shorting leads 322 and 324). *Id.* at 8:63–67. Leads 322 and 324 may be embedded directly in bezel 310 without the need for additional isolating material. *Id.* at 8:67–9:3.

Figures 4A and 4B, reproduced below, illustrate electronic devices having bezels with embedded heart sensor leads. *Id.* at 3:30–36.

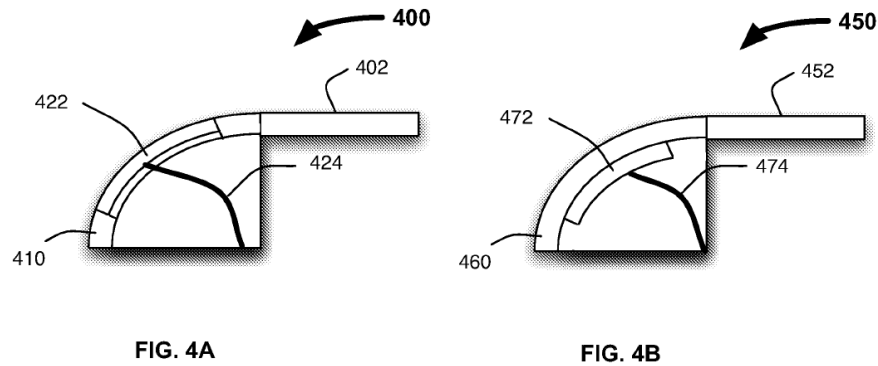


Figure 4A is a cross-sectional view of electronic device 400 having bezel 410 with embedded heart sensor lead 422, and Figure 4B is a cross-sectional view of another electronic device 450 having bezel 460 with embedded heart sensor lead 472. *Id.* at 9:18–21, 9:35–40. Electronic device 400 includes display 402 and bezel 410. *Id.* at 9:21–22. Lead 422 may be embedded along the outer surface of bezel 410 such that lead 422 is exposed to the user during use. *Id.* at 9:22–24. Connector 424 may be coupled to the inner surface of lead 422 and extend into electronic device 400 to be coupled with the processor. *Id.* at 9:24–26. Electronic device 400 may further include an isolating layer positioned between lead 422 and bezel 410 (not shown in Figure 4A). *Id.* at 9:26–28. The isolating layer may be constructed from a suitable material having non-conductive properties. *Id.* at 9:28–30. Alternatively, if the material of bezel 410 is not conductive, or insufficiently conductive to cause several distinct leads 422 positioned on bezel 410 from shorting, no isolating layer may be necessary. *Id.* at 9:32–35.

Electronic device 450 includes display 452 and bezel 460. *Id.* at 9:39–40. If the electrical conductivity and size of bezel 460, and the strength or characteristics of the cardiac signal provided by the user and detected by the heart sensor are adapted such that the signal can be

transmitted along short distances in bezel 460, lead 472 of the heart sensor may be positioned against the back surface of bezel 460. *Id.* at 9:40–45. Alternatively, lead 472 may be placed within the thickness of bezel 460 (e.g., in a pocket within the bezel wall), but underneath the outer surface of the bezel. *Id.* at 9:45–48. The short thickness of bezel 460 allows electrical signals to propagate from the user to the outer surface of bezel 460, through bezel 460, and into lead 472, which may in turn transmit the signals to the processor using connector 474. *Id.* at 9:48–52. In addition, if several leads are placed along different portions of bezel 460, the distance between adjacent leads may be sufficiently large (e.g., substantially larger than the thickness of bezel 460) that different leads of bezel 460 cannot detect the same electrical signal. *Id.* at 9:52–57.

D. Illustrative Claim

Claims 1 and 15 are independent claims. Claim 1, reproduced below, is illustrative.³

1. [1.pre] An electronic device for detecting a user's cardiac signal, comprising:
 - [1.a] an enclosure;
 - [1.b] a heart sensor configured to detect the user's cardiac signal, the heart sensor comprising:
 - [1.c.1] a first lead comprising a first pad that is embedded in a first portion of the enclosure, [1.c.ii] wherein an exterior surface of the enclosure comprises an exterior surface of the first portion, [1.c.iii] wherein the first pad is positioned underneath the exterior surface of the first portion, and wherein the first pad is configured to detect a first electrical signal of the user's

³ We reproduce claim 1 using similar bracketed designations as those added by Petitioner. *See* Pet. 7–29.

cardiac signal via the user's skin's contact with the exterior surface of the first portion of the enclosure; and

[1.d.i] a second lead comprising a second pad that is embedded in a second portion of the enclosure, [1.d.ii] wherein the second pad is configured to detect a second electrical signal of the user's cardiac signal via the user's skin's contact with at least one of the second pad and the second portion of the enclosure; and

[1.e] a processor coupled to the heart sensor and configured to receive and process the detected cardiac signal, wherein the first lead further comprises a first connector coupled to the first pad and configured to provide the first electrical signal detected by the first pad to the processor, and wherein the second lead further comprises a second connector coupled to the second pad and configured to provide the second electrical signal detected by the second pad to the processor.

Ex. 1001, 12:21–49. Independent claim 15 is similar in scope to claim 1, but additionally requires “a display screen,” and “a second lead embedded in the display screen.” *Id.* at 14:1–2, 14:12.

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit(s)
Markel	US 2007/0021677 A1, pub. Jan. 25, 2007	1005
Nissilä	US 6,775,566 B2, iss. Aug. 10, 2004	1006
Righter	US 5,191,891, iss. Mar. 9, 1993	1007

Petitioner supports its arguments by submitting, *inter alia*, three declarations from Dr. Ronald D. Berger. *See* Exs. 1003, 1021, 1023.

Petitioner also relies on other exhibits as discussed below. Patent Owner submits, *inter alia*, two declarations from Dr. Thomas W. Kenny. *See* Exs. 2001, 2004.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds (Pet. 1):

Claim(s) Challenged	35 U.S.C. §⁴	Reference(s)/Basis
1–22	103	Markel
1–22	103	Markel, Nissilä
12, 13, 19	103	Markel, Nissilä, Righter

II. ANALYSIS OF PETITIONER’S CHALLENGES

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). The evidentiary standard to meet that burden is “preponderance of the evidence.” 35 U.S.C § 316(e).

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying

⁴ The Leahy-Smith America Invents Act (“AIA”) includes revisions to 35 U.S.C. §§ 102 and 103 that became effective on March 16, 2013. Because the earliest filed application identified in the ’257 patent has a filing date of at least as early as January 23, 2009 (Ex. 1001, code (63), 1:7–12), we apply the pre-AIA-versions of 35 U.S.C. §§ 102 and 103.

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 skill in the art; and (4), if present, any objective evidence of obviousness or non-obviousness.⁵ See *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey–Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Petitioner contends the following:

A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the ’257 Patent would have been a person with a working knowledge of physiological monitoring technologies, a Bachelor of Science degree in an academic discipline emphasizing the design of electrical, computer, or software technologies, and training or at least one to two years of related work experience with capture and processing of data or information, including but not limited to physiological monitoring technologies (Ex. 1003, ¶38). More education can supplement practical experience and vice versa (Ex. 1003, ¶38).

Pet. 6–7.

Patent Owner, in turn, contends the following:

A person of ordinary skill in the art on or about the claimed priority date of the ’257 Patent (“POSITA”) would have had at

⁵ Neither party has introduced any objective evidence in this proceeding.

least a bachelor's degree in electrical engineering, mechanical engineering, biomedical engineering, computer engineering, physics, or a related field, and would have had at least two years of relevant work experience with capture and processing of data or information, including but not limited to physiological information, or equivalents thereof. Less work experience may be compensated by a higher level of education and vice versa.

PO Resp. 7 (citing Ex. 2003 ¶¶ 23–24) (internal citation omitted).

Patent Owner's proposed level of ordinary skill in the art is somewhat broader in both education and proposed work experience. Patent Owner's proposed work experience is somewhat vague and potentially outside the scope of the claimed invention. For example, the requirement that the person of ordinary skill in the art have experience with the "capture and processing of data or information, including but not limited to physiological information," would seemingly encompass data processing areas that do not relate to the scope of the claimed invention. We adopt Petitioner's level of the level of ordinary skill in art because it is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). Nevertheless, our analysis and the end result are the same under either proposed definition.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire

patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

1. Petitioner’s Proposed Claim Constructions

In the Petition, Petitioner proposes constructions for:

- the preamble (recited in the independent claims);
- the term “lead” (recited in the independent claims);
- the term “pad” (recited in the independent claims);
- the clause “a first pad that is embedded in a first portion of the enclosure, wherein an exterior surface of the enclosure comprises an exterior surface of the first portion, wherein the first pad is positioned underneath the exterior surface of the first portion” hereafter “element [1.c.iii]” recited in claim 1;
- the clause “wherein the first pad and the second pad are positioned apart from one another at a distance larger than the thickness of the second portion by material having the second conductivity,” hereafter “element [7.a]” (recited in dependent claim 7); and
- the term “bezel” (recited in dependent claims 12, 13, and 19).

Pet. 4–5, 11, 16, 19, 39, 47, 87, 89.

In Petitioner’s Reply to Patent Owner’s Response and in the Supplemental Briefing, Petitioner addressed the term “embedded in.” Pet. Reply 1–6; Pet. Supp. Br. 1–5. Petitioner also further discussed the meaning of element [1.c.iii] and “bezel.” Pet. Reply 6–8.

2. *Patent Owner's Proposed Claim Constructions*

In its Patent Owner Response, Patent Owner proposed constructions for the following terms or phrases:

- “embedded in”;
- “a first pad that is embedded in a first portion of the enclosure, wherein an exterior surface of the enclosure comprises an exterior surface of the first portion, wherein the first pad is positioned underneath the exterior surface of the first portion” (element 1.c.iii); and
- “bezel.”

PO Resp. 7–12.

In its Sur-reply and Supplemental Briefing, Patent Owner further addressed the meaning of “embedded” and “embedded in.” PO Sur-reply 2–4; PO Supp. Br. 1–5. Patent Owner also further addressed the meaning of “bezel.” PO Sur-reply 4–5.

3. *Discussion—Claim Construction*

Although the parties seemingly have views that differ to some extent as to the meaning of “embedded in” and “bezel,” we determine that appropriate resolution of this proceeding does not require us to make explicit the meaning of either of those terms.⁶ It is, however, necessary to address the meaning of limitation [1.c.iii].

⁶ Notably, both parties agree that the term “embedded [in]” has its “plain and ordinary meaning,” and, despite some dispute over the scope of that meaning, both parties contend that it is unnecessary for this panel to adopt any construction for the term. *See, e.g.*, Pet. Supp. Br. 1 (“The Board does not need to adopt a construction for ‘embedded [in]’ because AliveCor and Apple agree the phrase deserves its plain and ordinary meaning.”); PO Supp.

In the Petition, Petitioner advances two “interpretation[s]” of limitation [1.c.iii] in urging that Markel accounts for that limitation. Pet. 16–21. Petitioner characterizes one interpretation as “Apple’s interpretation” that is said to have been advanced by Patent Owner in alleging infringement. *Id.* at 16. The second interpretation is assessed by Petitioner as being the “correct interpretation.” *Id.* at 19. To the extent necessary, we evaluate those interpretations below.

a) “Apple’s interpretation”

With respect to the interpretation styled as “Apple’s interpretation,” we understand Petitioner to urge that the interpretation contemplates that the first pad need only include a “surface of an exposed electrode pad” to account for the requirement of that the pad “positioned underneath an exterior surface” of a first portion of an enclosure. Pet. 16–19. Petitioner, however, seemingly disparages that interpretation in characterizing an alternative interpretation as one that is “correct.” *See, e.g.*, Pet. 19–21. It naturally follows from such assessment that Petitioner believes that the meaning presented as “Apple’s interpretation” is, in fact, incorrect. Indeed, Petitioner’s own declarant, Dr. Berger, also expresses disagreement with that interpretation, and characterizes it as “incorrect.” *See, e.g.*, Ex. 1003 ¶ 126 (“Apple’s interpretation of the claim language (with which I disagree) . . .”); ¶ 127 (“Under Apple’s own interpretation . . . (with which I disagree)[.]”); ¶ 128 (“This interpretation is incorrect . . .”)

Br. 1 (“formal construction for the term ‘embedded in’ is not strictly necessary”), 2 (“Apple’s construction goes to the proper plain and ordinary meaning of the term ‘embedded in’[.]”).

Furthermore, Patent Owner follows suit and discounts the propriety of the pertinent “Apple’s interpretation.” We note that Patent Owner characterizes the interpretation as having been “erroneously” attributed to Patent Owner. PO Resp. 10–11, 23. Patent Owner also associates the term “fail” or “fails” with the asserted interpretation, and, like Dr. Berger, expressly characterizes it as “incorrect.” *See, e.g., id.* at 23, 26; PO Resp. 11.

Unsurprisingly, we find it difficult to give credence to a claim interpretation that both parties regard as not correct. Indeed, we also see little logic in an interpretation or construction that permits a component, i.e., a pad, to be both “positioned underneath” an exterior surface, yet also somehow constitute a part of that very surface. Accordingly, we proceed to evaluate what Petitioner views as the “correct interpretation” of limitation [1.c.iii].

b) The “correct interpretation”

In the Petition, Petitioner assesses what it calls the “correct interpretation” in discussion spanning pages 19 through 21.⁷ Pet. 19–21. It is of some note that Petitioner does not articulate a singular, cogent statement as to what specifically constitutes the proposed “correct

⁷ We are cognizant that it is within a discussion of the ground of unpatentability based on Markel that Petitioner opted to assess the “interpretation” or construction of limitation [1.c.iii]. *See* Pet. 19–21. Although it is curious that Petitioner did not include such interpretation or construction of a central claim term/phrase of the ’257 patent as a part of Petitioner’s dedicated “Claim Construction” section (*see* Pet. 4–5), it is apparent that Petitioner’s interpretation discussion at pages 19–21 of the Petition operates to facilitate understanding of limitation [1.c.iii] generally.

interpretation.” We, however, are able to discern the contours of that interpretation from Petitioner’s discussion in the above-noted pages as a whole. In particular, Petitioner clearly places focus as a part of the “correct interpretation” on the language of claim 1, itself, in requiring that the pad be positioned “underneath” another component or structure, i.e., “the exterior surface of the first portion” of the enclosure (*see* Ex. 1001, 12:29–31). Pet. 20–21. Petitioner offers additional context for the understanding of “undemeath” in emphasizing that a pad is “substantially concealed (or hidden)” from a user when it is positioned “underneath” another component. *See id.* at 20; *see also* Ex. 1003 ¶ 135 (offering the same emphasis). It is clear from that additional context that Petitioner’s “correct interpretation” does not encompass a surface of the pad that is on, or part of, an exterior surface that is visible to a user, as was seemingly encompassed by the “Apple’s interpretation” of limitation [1.c.iii], which, as noted above, is regarded by both parties as incorrect (*see* § II.C.3.a)).

Patent Owner does not appear to address head-on the “correct interpretation” relied upon by Petitioner, but does advance its own views as to the meaning of limitation [1.c.iii]. Specifically, Patent Owner contends that the limitation “requires that the first pad be a distinct component from the first portion of the enclosure and that the first pad be both ‘embedded in’ and ‘positioned underneath’ the first portion of the enclosure,” such that first pad and the first portion of the enclosure cannot constitute the same structure. PO Resp. 11–12 (citing Ex. 2004 ¶ 37 (“The plain language of the claim requires a ‘first pad’ that is distinct from ‘the first portion of the enclosure’ and also specifies a physical relationship between the two components, reciting that the first pad is both ‘embedded in [the] first

portion of the enclosure’ and ‘positioned underneath the exterior surface of the first portion’ of the enclosure.”)); *see also id.* at 10 (“This claim recitation should be given its plain and ordinary meaning, as it requires precisely what it says” (citing Ex. 2004 ¶¶ 36–37)).

In response to the “distinct component” aspect of Patent Owner’s contention (and Dr. Berger’s testimony), Petitioner represents that “the parties appear to agree the first portion of the enclosure and the first pad cannot be met by the same structure.” *See* Pet. Reply 6.

In carefully and faithfully wrangling the parties’ views and explanation as to the meaning of limitation [1.c.iii], we conclude that Petitioner’s “correct interpretation” of that limitation is that a first pad is recognized as a distinct structure or component from a first portion of an enclosure, and that the pad is positioned underneath that first portion in a manner such that the pad is concealed from a user. We adopt that interpretation.

We determine that it is unnecessary to discuss an express construction for any other term to resolve this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Obviousness of Claims 1-22 over Markel

Petitioner alleges that claims 1–22 would have been obvious over Markel. Pet. 7–69. Patent Owner contends that Petitioner has failed to demonstrate how Markel discloses certain claim limitations. *See generally* PO Resp; PO Sur-reply. We evaluate this ground below.

1. *Overview of Markel (Ex. 1005)*

Markel is titled “Mobile Communication Device and Other Devices with Cardiovascular Monitoring Capability” and it relates to “a general-purpose mobile communication device (e.g., a cellular telephone, portable email device, personal digital assistant, etc.) comprising a communication interface module adapted to communicate with a general-purpose communication network, and at least one module operational to acquire cardiac information from a user of the general-purpose mobile communication device.” Ex. 1005, codes (54), (57). Figure 1 of Markel (reproduced below) illustrates such a mobile communication device. *Id.* ¶ 6.

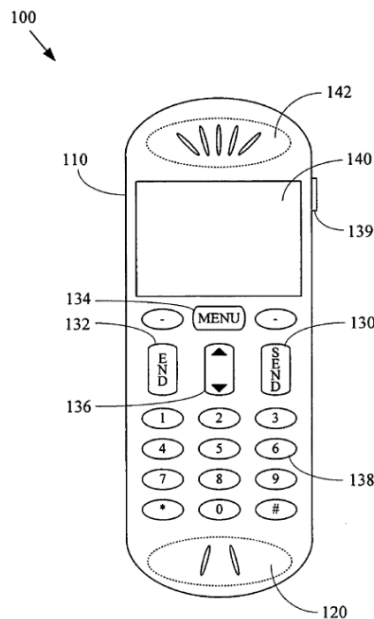


Figure 1

Figure 1 illustrates a mobile communication device 100 including a cardiac sensor. Ex. 1005 ¶¶ 33, 35. Mobile communication device (“MCD”) 100 illustrated in Figure 1 may comprise characteristics of a cellular or portable telephone, of a personal digital assistant with mobile communication capability, portable email device, or pager. Ex. 1005 ¶ 33.

MCD 100 includes main body portion 110, user input features (including microphone 120), user output features (including a display 140 that may also function as a touch screen input feature, and speaker 142), and pushbuttons (such as send button 130, end button 132, menu button 134, scroll button 136, numeric button 138 and volume control button 139). *Id.* ¶ 34.

MCD 100 also includes “at least one cardiac sensor (e.g., one or more electrodes, an audio monitoring or acoustical detection device, etc.) that is adapted to detect cardiac activity of a user of the MCD 100.” *Id.* ¶ 35. The electrodes may be adapted to detect cardiac activity of a user that is conductively coupled to the electrodes (e.g., by touching the electrodes). *Id.* Such electrodes may be incorporated into MCD 100. *Id.* The electrodes include a conductive material. *Id.* ¶ 37. For example, an electrode may comprise a metallic surface exposed for user contact. *Id.* The electrode also may be formed from conductive plastic (or another material) that may be integrated into various molded components of the mobile communication device. *Id.*

Electrodes may additionally be identified for the user in any of a variety of manners, or may be “concealed (or hidden)” from the user. *Id.* ¶¶ 39–40. For example, an electrode may be “concealed” or “hidden” by being molded conductive plastic with little or no visible indication of the electrode presence. *Id.* ¶ 40. The electrodes may be positioned such that the one or more electrodes contact a user during normal (or typical) use of MCD 100. Ex. 1005 ¶ 41.

Figure 4 of Markel (reproduced below) is a diagram illustrating an MCD having electrodes disposed on a main body portion. Ex. 1005 ¶¶ 9, 45.

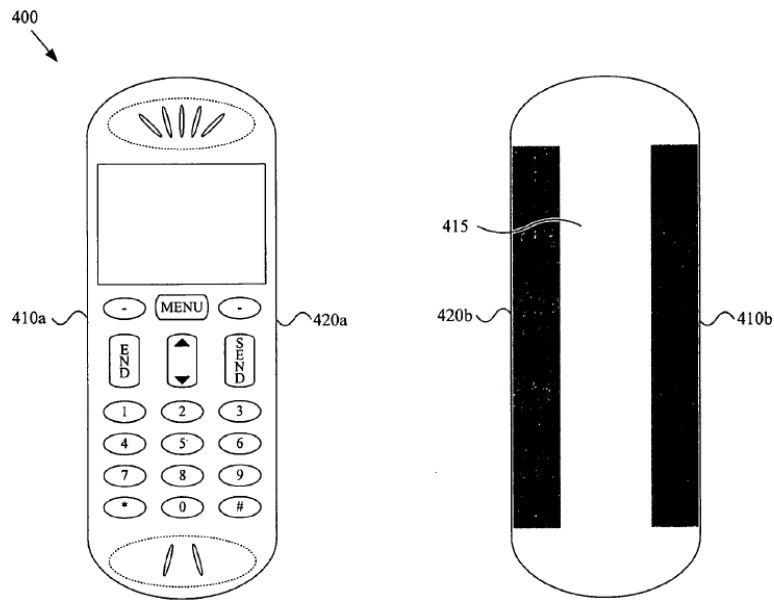


Figure 4

Figure 4 above is a diagram illustrating a mobile communication device having electrodes disposed on a main body portion thereof.

Ex. 1005 ¶¶ 9, 45. As shown in Figure 4, first and second electrodes may be disposed on main body portion 110 of MCD 400. Ex. 1005 ¶¶ 9, 45. MCD 400 includes left side portion 410 and right-side portion 420, with first electrode placed on left side portion 410 (e.g., placed on or molded into region 410*b*), and a second electrode placed on right side portion 420 (e.g., placed on or molded into region 420*b*). *Id.* In a case where regions 410*b* and 420*b* include conductive plastic, insulating region 415 may separate regions 410*b* and 420*b*. *Id.*

Figure 6 of Markel (reproduced below) is a diagram illustrating an MCD having electrodes disposed on an audio output portion and a main body portion. Ex. 1005 ¶¶ 11, 50.

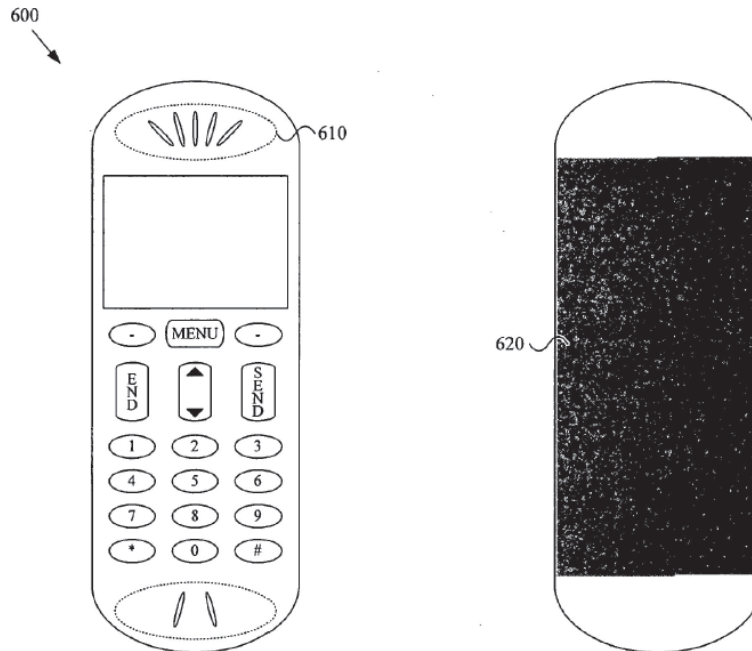


Figure 6

Figure 6 of Markel is a diagram illustrating a mobile communication device having electrodes disposed on an audio output portion and a main body portion thereof. Ex. 1005 ¶¶ 11, 50. As shown in Figure 6, first and second electrodes may be disposed on MCD 600. Ex. 1005 ¶¶ 11, 50. MCD 600 includes audio output portion 610 and main body portion 620, with a first electrode placed on main body portion 620 (e.g., placed on or molded into region 620), and a second electrode placed on audio output portion 610 (e.g., placed on or molded into region 610). *Id.*

Figure 10 of Markel (reproduced below) illustrates portions of an MCD 1000 including two or more electrodes. Ex. 1005 ¶¶ 15, 58.

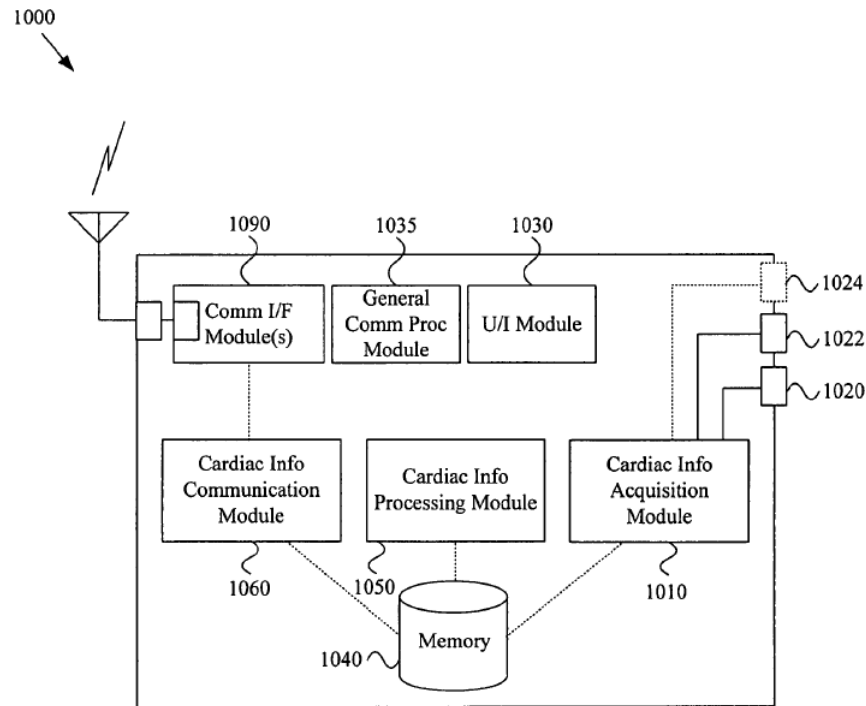


Figure 10

Figure 10 of Markel illustrates portions of an MCD 1000 including two or more electrodes. Ex. 1005 ¶¶ 15, 58. MCD 1000 illustrated in Figure 10 includes first electrode 1020 and second electrode 1022 (and, for example, a third or N^{th} electrode 1024). Ex. 1005 ¶ 58. MCD 1000 may also include a cardiac information acquisition module 1010 coupled to first and second electrodes 1020 and 1022, the module utilizing first and second electrodes 1020, 1022 to detect and acquire various cardiac signals from a user. *Id.*

2. Independent Claim 1

Independent claim 1 requires, in pertinent part, limitation [1.c.iii]. For

convenience, we reproduce that limitation below.⁸

[1.c.iii] wherein the first pad is positioned underneath the exterior surface of the first portion, and wherein the first pad is configured to detect a first electrical signal of the user's cardiac signal via the user's skin's contact with the exterior surface of the first portion of the enclosure.

Ex. 1001, 12:31–34. *See also* Pet. 10–21.

A primary focus of the parties' dispute as to claim 1 lies with the above-noted limitation. As discussed above (*see* § II.C.3.b), we adopt what we understand to be the “correct interpretation” of limitation [1.c.iii] that was discussed by Petitioner.⁹ That interpretation calls for a first pad to be a distinct structure from a first portion of an enclosure where the first pad is positioned underneath that first portion in manner such that it is concealed from a user.

a) Summary of Petitioner's Arguments

In connection with limitation [1.c.iii], Petitioner contends that Markel “renders obvious” that limitation. Pet. 19. In attempting to support that contention, Petitioner urges that Markel discloses that a “‘second electrode’ comprises a first pad that is embedded in the ‘audio output portion 610’ (i.e., a first portion of the enclosure).” *Id.* at 20 (referencing limitation [1.c.i] and Ex. 1003 ¶ 135). According to Petitioner, a person of ordinary skill in the

⁸ Limitation [1.c.i] first introduces “a first lead comprising a first pad that is embedded in a first portion of the enclosure.” Ex. 1001, 12:26–27; *see* Pet. 10.

⁹ Both parties offer arguments that involve “Apple’s interpretation” of limitation [1.c.iii] (*see, e.g.*, Pet. 16–19; PO Resp. 23–26), but, as noted above (*see* § II.C.3.a), we reject that interpretation as being illogical and incorrect according to both parties. Accordingly, we need not address the parties’ merits-based arguments that involve “Apple’s interpretation.”

art would have been motivated “to place the pad of the ‘second electrode’ *underneath*^[10] the conductive plastic of the ‘audio output portion 610’ (i.e., a first portion of the enclosure)” of Markel to substantially conceal “the electrode pad from the user, which would have been desirable to increase the device’s aesthetics while protecting the electrode.” *Id.* (Ex. 1003, ¶135; Ex. 1005 ¶ 37). Similarly, Petitioner is of the view that to detect the cardiac signal, “a POSITA would have placed the pad of the ‘second electrode’ in *Markel*’s Figure 4 *underneath* the conductive plastic of the ‘right side portion 420.’” Pet. 21 (citing Ex. 1003 ¶ 139). Petitioner additionally submits that a skilled artisan would have had a reasonable expectation of success in placing the electrode pad underneath the conductive plastic and detecting a cardiac signal of the audio output portion. Pet. 21 (citing Ex. 1003 ¶¶ 137–138; Ex. 1005 ¶¶ 35, 37, 45).

In its Reply, Petitioner generally reiterates its views that Markel’s teachings would have suggested limitation [1.c.iii] to one of ordinary skill in the art, and discounts Patent Owner’s arguments to the contrary as “improper[.]” *See* Pet. Reply 9–14. In urging that the panel should reject Patent Owner’s arguments, Petitioner takes positions such as: (1) Patent Owner “incorrectly assumes an exterior ‘electrode’ cannot meet element [1.c.iii]’s requirement of a ‘pad’ ‘positioned underneath the exterior surface of the’ enclosure” (*id.* at 9); (2) “[a] ‘pad’ is a narrower term referring to a specific component of an ‘electrode’” (*id.* at 10); (3) “a POSITA would have been motivated to construct an electrode pad with ‘superior conductivity’ to ensure a ‘high margin for success’” (*id.* at 13 (citing Ex. 1001, 45:3–48:14));

¹⁰ Unless otherwise noted, in this Decision, emphasis presented is a part a party’s argument and was provided by the party.

(4) Petitioner’s declarant “opined a POSITA would be motivated to ‘substantially conceal[] or hid[e]’ the pad of the electrode from the user to increase aesthetics while protecting the pad (*id.* at 14 (citing Pet. 20; Ex. 1005 ¶ 40; Ex. 1003 ¶ 135)); and (5) “*Markel* renders obvious that ‘audio output portion 610’ comprises a ***pad*** underneath the enclosure” (*id.*).

b) Summary of Patent Owner’s Arguments

Patent Owner disagrees with Petitioner. To that end, Patent Owner contends that “[t]here is no disclosure or suggestion in *Markel* that would have motivated a POSITA to place an electrode pad ***underneath*** an enclosure of a device.” PO Resp. 26 (citing Ex. 2001 ¶¶ 72–73; Ex. 2004, ¶¶ 77–94). Patent Owner discounts Petitioner’s argument that a person of ordinary skill in the art would have been motivated to position an internal electrode pad under an external conductive layer due to *Markel*’s discussion surrounding “substantially conceal[ing]” the electrode. *Id.* Patent Owner expresses that such argument overlooks the actual disclosures of *Markel*. *Id.* As explained by Patent Owner, the actual disclosures of *Markel* “reveal that the presence of electrodes is concealed by forming the electrodes of a ‘conductive plastic’ that visually blends in with the surrounding plastic housing” and does not disclose the “conceal[ment] of electrodes by positioning them under the exterior surface of the device.” *Id.* at 27 (citing Ex. 1005 ¶¶ 37–40, 45, 47; Ex. 2001 ¶ 77; Ex. 2004 ¶¶ 78–79, 81).

Patent Owner also urges that in each of the three different embodiments set forth in *Markel*, the electrodes that the Petitioner identifies as a “first pad” are “expressly described as being on the ***exterior*** of the device for direct contact with the skin of the user.” PO Resp. 27 (citing Ex. 2004 ¶¶ 82, 85–88, 64). Patent Owner contends the Petition fails

because all three mappings presented “are all external electrodes positioned for direct contact with the user’s skin.” *Id.* (citing Ex. 2004 ¶¶ 85–88).

Patent owner points to Figures 4, 6, and 10 of Markel as demonstrating that the electrodes are “clearly depicted as being positioned on, and extending from, the exterior of the device.” *Id.* at 28.

Patent Owner further expresses that Markel “discloses two scenarios for its electrodes: one where the electrodes are identifiable by the user and the other where the electrodes are ‘concealed from the user.’” PO Resp. 29 (citing Ex. 1005 ¶ 39; Ex. 2001 ¶ 75; Ex. 2004 ¶¶ 80–81). Patent Owner refers to Figure 3 of Markel as an illustration in which the identifiable electrodes positioned on the exterior “may comprise *a visible or tactile indicium* to indicate the location of the electrode to a user.” *Id.* (citing Ex. 2004 ¶¶ 80–82). In the embodiment of ***concealed*** electrodes, Markel explains it “‘may be substantially concealed (or hidden) from a user’ by having the electrode made of ‘***molded conductive plastic with little or no visible indication of the electrode presence.***’” PO Resp. 29–30 (citing Ex. 2004 ¶ 40). Patent Owner further emphasizes that Markel “[f]orms an ***electrode from*** ‘conductive plastic,’ and molding the conductive plastic into the corresponding portion of the device.” PO Resp. 30 (citing Ex. 1005 ¶ 37). Patent Owner thus contends the “concealed alleged electrode in Markel is ‘***made of***’ or ‘***formed from***’ the conductive plastic, and is not ***underneath*** a conductive plastic layer. *Id.* at 30–31 (citing Ex. 2001 ¶ 77; Ex. 2004 ¶ 82). Patent Owner contends that “[a] POSITA would find nothing in cited portions of Markel to inform or encourage placement of an electrode underneath an exterior layer” because Markel “describes concealing electrodes by making them from conductive plastics not discernible by a

user . . . on the exterior of the device.” *Id.* at 31 (citing Ex. 2001 ¶ 78; Ex. 1005 ¶ 40; Ex. 2004 ¶ 83).

Patent Owner submits that a “POSITA would not be motivated to modify Markel in the manner” Petitioner presents. PO Resp. 35. In addition to any factual basis, Patent Owner contends that Petitioner’s obviousness theory in Ground 1 is faulty because it “fails to provide any reasoning as to why a POSITA would have found Markel’s method of concealment to be deficient, or why a POSITA would have been motivated in light of Markel’s manner of concealment to nevertheless place an electrode underneath the exterior portion of the device.” *Id.* at 31, 35 (citing Ex. 2001 ¶ 79; Ex. 2004 ¶ 84). Instead, Patent Owner contends that Markel “gives rise to an especially strong ‘inference of nonobviousness’” because it “expressly describes how to conceal the presence of its external electrodes (by forming them of molded conductive plastic) and includes no suggestion to place a second electrode under the external electrode.” PO Resp. 36 (citing *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1326 (Fed. Cir. 2009)).

Patent Owner additionally argues that Markel does not disclose or suggest concealment underneath the enclosure of the device, because the invention is “directed to **exposing** its electrodes to **enable a user to directly contact them**” specifically directing “[s]uch electrode placement’ . . . is to *provide for user contact with both electrodes*” during use. PO Resp. 32 (citing Ex. 1005 ¶ 50). Patent Owner discounts Petitioner and Petitioner’s declarant proposal (*see, e.g.*, Pet. 31; Ex. 1003 ¶¶ 122, 135–139) that one of ordinary skill in the art would have modified Markel’s device to position an

electrode pad underneath an outer electrode as unsupported by any disclosure in Markel. PO Resp. 32–35.

In its Sur-reply, Patent Owner discounts arguments made by Petitioner in its Reply as “misleading and irrelevant.” PO Sur-reply 7. Patent Owner also contends that Petitioner “mischaracterizes” the testimony of Patent Owner’s declarant, Dr. Kenny. *Id.* at 12. Patent Owner proceeds to rebut arguments advanced by Petitioner and further addresses Dr. Kenny’s testimony en route to a position that Petitioner, as well as its declarant, Dr. Berger, provide insufficient support and analysis that the Petition adequately accounts for limitation [1.c.iii], and thus does not establish the unpatentability of the claims of the ’257 patent based on Markel. *See id.* at 7–20.

c) Discussion—Claim 1

A core dispute between the parties is whether, in light of Markel’s teachings, a skilled artisan would have positioned an electrode “pad” underneath an exterior surface of a portion of an enclosure of an electronic device. As both parties have observed, Markel discloses various embodiments that employ electrodes as a part of a mobile communication device. As noted above, Patent Owner surmises that Markel discloses three types of electrodes as a part of its different embodiments and notes that in each case the electrodes are “on” portions of a mobile device, such as audio output portion 610. *See, e.g.*, PO Resp. 27–29. Patent Owner characterizes that disclosure as conveying that the electrodes are “*exterior*” of the device, and constitute “*external*” electrodes positioned for direct contact with the user’s skin.” *Id.* (citing Ex. 2004 ¶¶ 64, 82, 85–88). Of note is that Petitioner does not disagree with such characterization. Indeed, Petitioner

acknowledges that Markel’s electrodes are regarded as components that are “exterior” or “exposed.” *See, e.g.*, Pet. Reply 9. Petitioner, however, theorizes that such disclosure is not an impediment to meeting the requirement of limitation [1.c.iii] pertaining to a “pad” that is “underneath” a surface of an enclosure. *See, e.g., id.* at 11 (“disclosure of an exterior ‘electrode’ does not preclude a prior art reference from rendering obvious the ‘pad’ of element [1.c.iii] (as Apple wrongly assumes)”). At first blush, that premise seems questionable, but, we proceed to further evaluate Petitioner’s view to that effect alongside Patent Owner’s view and the disclosure of Markel.

Patent Owner recognizes that “Markel discloses two scenarios for its electrodes: one where the electrodes are identifiable by the user, and the other where the electrodes are ‘concealed from the user.’” PO Resp. 29 (citing Ex. 1005 ¶ 39; Ex. 2001 ¶ 75; Ex. 2004 ¶¶ 80–81). The basis of Petitioner’s proposed ground of unpatentability centers on Markel’s disclosure pertaining to electrodes that are concealed. As Patent Owner observes (*see, e.g.*, PO Resp 29–31), Markel provides context for how it contemplates accomplishing such concealment. In that regard, Markel explains that one contemplated approach to concealing an electrode is through the use of “molded conductive plastic” so that the electrode is not visible. *See, e.g.*, Ex. 1005 ¶ 40. At various other portions, Markel similarly describes molding or forming electrodes or parts thereof from conductive plastic. *See, e.g., id.* ¶¶ 37, 45, 47. We agree with Patent Owner (*see, e.g.*, PO Resp. 30–31), and its declarant, Dr. Kenny (*see, e.g.*, Ex. 2001 ¶ 77; Ex. 2004 ¶ 82), that Markel’s contemplated approach to concealing the electrodes as a part of a conductive plastic layer involves molding or

integrating the electrode as a part of the layer rather than positioning it underneath another component.

Petitioner does not appear to disagree that Markel, itself, does not convey that an electrode, or any structure identifiable as a “pad,” is positioned underneath any surface of any enclosure. Rather, Petitioner’s theory of unpatentability is premised on modification of Markel to so position such a pad. Although seemingly acknowledging that Markel contemplates a concealment technique involving molding an electrode into an exterior surface, Petitioner extrapolates from that disclosure that a skilled artisan would be motivated to try an alternative means of concealing an electrode pad by placing the pad underneath an outer layer or portion, i.e., “audio output portion 610.” *See* Pet. 20 (citing Ex. 1003 ¶ 135). Neither Petitioner, nor Dr. Kenny, however, meaningfully explains why a skilled artisan would have deviated from Markel’s express teachings of concealing an electrode via molding techniques to then arrive at an entirely different concealment approach of placing an electrode pad underneath the audio output portion. Petitioner’s modification proposal in that regard appears borne of hindsight bias based on the disclosure of the ’257 patent rather than any dutiful consideration of what Markel’s actual teachings would have conveyed to a skilled artisan. *See* Ex. 2004 ¶ 84 (Dr. Kenny explaining why Petitioner’s proposed modification to Markel to hide the electrode underneath a plastic conductive layer was based on improper hindsight). Such hindsight bias is impermissible. *See, e.g., Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) (“[W]e cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention.”).

Patent Owner makes a more persuasive case as to what a person of ordinary skill in the art reasonably would have understood from Markel's disclosure. In particular, we agree with Patent Owner that the record before us readily conveys that a skilled artisan would have followed Markel's practice of forming or molding electrodes from conductive plastic rather than locating a separate electrode component underneath a conductive plaster layer. *See, e.g.*, PO Resp. 30–31 (“[a] POSITA would find nothing in cited portions of Markel to inform or encourage placement of an electrode underneath an exterior layer.”). Indeed, as Patent Owner articulates, Petitioner “fails to provide any reasoning as to why a POSITA would have found Markel's method of concealment to be deficient, or why a POSITA would have been motivated in light of Markel's manner of concealment to nevertheless place an electrode underneath the exterior portion of the device.” *Id.* To that end, we credit Dr. Kenny's supporting testimony as consistent with Markel's express teachings. *See, e.g.*, Ex. 2001 ¶¶ 77–83; Ex. 2004 ¶¶ 81–88. We credit that testimony over the countervailing testimony of Petitioner's declarant, Dr. Berger (*see, e.g.*, Ex. 1003 ¶¶ 122, 135–139), as we agree with Patent Owner that Dr. Berger's testimony “is not supported by Markel's actual disclosures.” PO Resp. 31.

d) Conclusion—Claim 1

We have considered all of the parties' arguments and positions advanced in their respective briefings as well as the evidence offered in support thereof. For the reasons set forth above, we determine that Petitioner's proposed ground of unpatentability based on Markel is deficient in accounting for limitation [1.c.iii]. That is dispositive, and, as a result we

conclude that Petitioner has not shown by a preponderance of the evidence that claim 1 is unpatentable over Markel.

3. Dependent Claims 2–14

Claims 2–14 ultimately depend from independent claim 1, and thus incorporate all the limitations of that independent claim, including limitation [1.c.iii]. Accordingly, we also conclude that Petitioner has not shown by a preponderance of the evidence that claims 2–14 are unpatentable over Markel.

4. Independent Claim 15

Claim 15, like claim 1, is drawn to an “electronic device for detecting a user’s cardiac signal.” Ex. 1001, 13:49–50. Claim 15 clearly has different claim language from claim 1. Notably, claim 15 does not include any limitation that is analogous to limitation [1.c.iii].

In its Response, Patent Owner does not advance any arguments in connection with claim 15 as to the proposed ground of unpatentability based on Markel (or any other ground). *See generally* PO Resp. Patent Owner also does not present arguments directed to, or even mentioning, claim 15 as a part of its Sur-reply. *See generally* PO Sur-reply. During oral argument and upon inquiry from the panel, counsel for Patent Owner expressed that Patent Owner is “going to rest on the papers on Claim 15.” Tr. 36:9–10. Upon further inquiry, counsel for Patent Owner was unable to identify any arguments pertaining to claim 15 as a part of its papers. *Id.* at 36:11–19. In considering those representations made during oral argument, and having reviewed Patent Owner’s briefings, we are unable to locate any arguments

challenging the ground of unpatentability proposed for claim 15 based on Markel (or any other ground).

In the Scheduling Order (Paper 13), we expressed that Patent Owner may file a response to the petition and “cautioned that any arguments not raised in the response may be deemed waived.” Paper 13, 9. The situation that is present here in which Patent Owner has presented no arguments pertaining to claim 15 reasonably gives rise to a conclusion that Patent Owner has waived any argument challenging Petitioner’s proposed grounds of unpatentability as to claim 15.¹¹

In any event, we note that Petitioner lays out its challenge to claim 15 based on Markel including record citation to content of Markel as well as citation to testimony of Dr. Berger. *See* Pet. 52–63. Thus, on the one hand, Petitioner has provided argument and evidence supporting a ground of unpatentability of claim 15 based on Markel, and on the other, Patent Owner has provided no argument or evidence challenging that ground. In reviewing the Petition, it also is not apparent to us that there are any defects in Petitioner’s challenge to 15 based on Markel.

Accordingly, given the circumstances presented here, we conclude that Petitioner has shown by a preponderance of the evidence that claim 15 is unpatentable based on Markel.

5. Dependent Claims 16–18

Claims 16–18 ultimately depend from claim 15. The circumstances noted above with respect to claim 15 are also present with respect to

¹¹ In its Reply, Petitioner also contends that Patent Owner has not proposed any arguments in connection with claim 15 and “has waived any opposition.” Pet. Reply 22.

dependent claims 16–18.¹² Having considered Petitioner’s arguments and evidence, we conclude that Petitioner has shown by a preponderance of the evidence that claims 16–18 are unpatentable over Markel.

6. Dependent Claim 19

Claim 19 is reproduced below:

19. The electronic device of claim 15, wherein:
the first portion of the electronic device comprises a bezel of the enclosure;
the electronic device further comprises a non-conductive component positioned between the bezel and the display screen for electrically isolating the first lead from the second lead.

Ex. 1001, 14:32–34.

Petitioner points to content of Markel, with support from the testimony of Dr. Berger, in explaining how Petitioner believes all of the features of claim 19 are accounted for by Markel. Pet. 65–67; *see also id.* at 47–49 (discussing limitation [12.a], which is referenced in Petitioner’s accounting of claim 19 on pages 65–67 of the Petition). In particular, Petitioner points to Markel’s disclosures of a “right side portion 420” of an electronic device that is a “first portion of the enclosure” and has “side portions” that “wrap around the front and back of the device, like a bezel.” *Id.* at 48 (citing Ex. 1003 ¶¶ 250–251). Alternatively, Petitioner contends that if Markel “is found not to disclose that the ‘first portion of the enclosure’ includes the ‘bezel,’ this would have been a trivial modification well-within the general knowledge of a POSITA.” *Id.* at 49 (citing Ex. 1003 ¶ 252). In that regard, Petitioner expresses the following:

¹² Petitioner supports its unpatentability challenge to claims 16–18 in the Petition on pages 63 through 65.

A POSITA would have extended the edges of *Markel*'s "second electrode" in 420*b* so that they reached the border of the "display 140" (i.e., bezel) because this would have created additional contact area to enhance the ability of the "second electrode" to detect a signal from a user's hand and make it more likely that a user would interact with the second electrode so as to have a successful test (Ex. 1003, ¶252).

Id. at 49.

Petitioner additionally contends that "*Markel* further teaches that its electrodes would be electrically isolated (*see* Claim 3; Ex. 1003, ¶332)," and that "[a] POSITA would thus have known that an 'insulating region' would electrically isolate the 'bezel' from the 'display 140' (Ex. 1003, ¶333)." Pet. 67.

Patent Owner asserts the following:

[W]ith respect to claim 19 specifically, AliveCor identifies an "insulating region" between the two electrodes positioned on the back of *Markel*'s device but does not identify "a non-conductive component positioned between *the bezel* and the *display screen*" as required by claim 19. Pet., 66-67; APPLE-2004, ¶159. Even if AliveCor's general assertion that "*Markel* further teaches that its electrodes would be electrically isolated" *and* its assertion that the electrode 420*b* would somehow form part of the bezel (Pet., 65-67) were both accepted as true, AliveCor still has shown no teaching in *Markel* that would instruct a POSITA to isolate an electrode embedded in the display and an electrode embedded in the bezel in the precise manner recited by claim 19, rather than electrically isolating the two electrodes in another manner. APPLE-2004, ¶159.

PO Resp. 73–74.

Patent Owner, thus, does not appear to expressly dispute Petitioner's view that *Markel* conveys that its electrodes would be electrically isolated or that electrode 420*b* would be part of a bezel. Rather, Patent Owner

challenges Petitioner for not explaining why a skilled artisan would seek “to isolate an electrode embedded in the display and an electrode embedded in the bezel in the precise manner recited by claim 19, rather than electrically isolating the two electrodes in another manner.” *Id.* at 74 (citing Ex. 2004 ¶ 159).

It is noteworthy that Patent Owner’s argument is not based on its particular construction of “bezel,” or that the meaning of bezel that was advanced by Patent Owner (*see, e.g.*, PO Resp. 12) operates to distinguish claim 19 over Markel’s teachings. It also is notable that Patent Owner does not appear to dispute that Markel discloses that one of its electrodes is embedded in a display and another is embedded in the bezel as is urged Petitioner.¹³ Rather, Patent Owner apparently is of the view that claim 19 requires some “precise manner” of isolating the two electrodes, and that “precise manner” is presumably not addressed by Petitioner. That reference to an alleged “precise manner” for isolation without elaboration is vague and difficult to parse. Dr. Kenny also provides the same vague discussion as a part of his declaration. *See* Ex. 2004 ¶ 159.

On this record, we discern that Petitioner, supported by the testimony of Dr. Berger (*see* Ex. 1003 ¶¶ 250–252, 332, 333), articulates credible explanation and reasoning as to how Markel’s teachings give rise to the requirements of claim 19 including electrically isolating two electrodes by

¹³ To that end, although the parties have offered differing meanings for the term “embedded in” and that term is disputed in connection with claim 1, Patent Owner’s arguments as to claim 19 do not appear to turn on any particular meaning of “embedded in,” or that any meaning of “embedded in” is dispositive as to claim 19.

creating an “insulating region” that “would electrically isolate the ‘bezel’ from the ‘display 140.’” *See* Pet. 67.

Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that claim 19 is unpatentable based on Markel.

7. Dependent Claims 20–22

Claims 21 and 22 depend from claim 20. Claim 20 depends from claim 15 and adds “wherein the first lead is configured to detect the first electrical signal of the user’s cardiac signal via the user’s contact with the first portion of the enclosure.” Ex. 1001, 14:38–42. As a part of element [15.d.i], Petitioner previously identified Markel’s “first electrode 1020” as structurally constituting, and functioning as, the claimed “first lead.” *See* Pet. 54–56 (citing, in-part, Ex. 1005 ¶ 50; Ex. 1003 ¶ 280). Petitioner further sets forth the following in accounting for claim 20:

Markel renders obvious [20.a] (Ex. 1003, ¶¶ 337–339).

Markel discloses a “first electrode” embedded in the “main body portion 620,” which corresponds to the claimed “first lead” (*see* [15.d.i]; Ex. 1003, ¶ 338). Furthermore, the “first electrode” may be configured to detect a cardiac signal via the user’s contact with the “main body portion 620” (*see* [15.d.ii]; Ex. 1003, ¶ 338). Consequently, the first lead is configured to detect the first electrical signal of a cardiac signal via the user’s contact with the first portion of the enclosure (Ex. 1003, ¶ 338).

Pet. 67–68.

According to Patent Owner, “the electrodes in Markel’s device detect the first electrical signal of the user’s cardiac signal via direct contact between the electrode and the user’s skin, *not* ‘via the user’s contact with the first portion of the enclosure.’” PO Resp. 76–77 (citing Ex. 2004 ¶¶ 166–168

and referencing generally Patent Owner's prior arguments pertaining to claim 1).

In considering Patent Owner's arguments and Dr. Kenny's noted testimony pertaining to claim 20, we find both the arguments and testimony difficult to follow. Neither Patent Owner nor Dr. Kenny disputes that Markel's "first electrode" constitutes the claimed "first lead." Both Petitioner and Dr. Berger point to Markel's disclosure of either molding the first electrode into main body portion 620 or positioning the electrode on main body portion 620. *See, e.g.*, Pet. 55 (citing Ex. 1005 ¶ 50); Ex. 1003 ¶ 280. Petitioner and Dr. Berger also cite to Markel's disclosure that its "electrodes may, for example, be adapted to detect cardiac activity of a user that is conductively coupled to the electrodes (e.g., by touching the electrodes)" (Ex. 1005 ¶ 35). *See, e.g.*, Pet. 57–58; Ex. 1003 ¶¶ 286–289. Thus, Petitioner and Dr. Berger persuasively and credibly identify disclosure in Markel that a first lead (i.e., first electrode 1020) may form part of an enclosure (i.e., main body portion 620) and operates to detect cardiac activity of a user through contact with the user and the electrode. That disclosure is readily viewed as accounting for claim 20's requirement that "the first lead is configured to detect the first electrical signal of the user's cardiac signal via the user's contact with the first portion of the enclosure." We reject Patent Owner's contrary arguments (*see, e.g.*, PO Resp. 76–77), and Dr. Kenny's associated testimony (*see, e.g.*, Ex. 2004 ¶¶ 166–168), as not being in accord with Markel's plain and clear disclosure.

Claims 21 and 22 depend from claim 20. Petitioner persuasively explains, with adequate record citation, how Markel's teachings account for

the added features of claims 21 and 22. *See* Pet. 68–69. Patent Owner does not advance any arguments in connection with claims 21 and 22.

Accordingly, we determine that Petitioner has shown by a preponderance of the evidence that claims 20–22 are unpatentable based on Markel.

E. Obviousness of Claims 1-22 over Markel and Nissilä

1. Overview of Nissilä (Ex. 1006)

Nissilä is titled “Electrode Structure and Heart Rate Measuring Arrangement” and it relates to “an electrode structure and a heart rate measuring arrangement for measuring an ECG signal on the skin of a person’s chest.” Ex. 1006, codes (54), (57). The device can be used for non-invasive heart rate monitoring in connection with exercise and sport activities. *Id.* at 1:6–9. The device is described as “inconspicuous, comfortable and well suited for long-term use.” *Id.* at 4:23–24.

Figure 5 of Nissilä (reproduced below) illustrates a cross section of the electrode structure of a heart rate measuring arrangement. Ex. 1006, 4:35–36, 4:40–41.

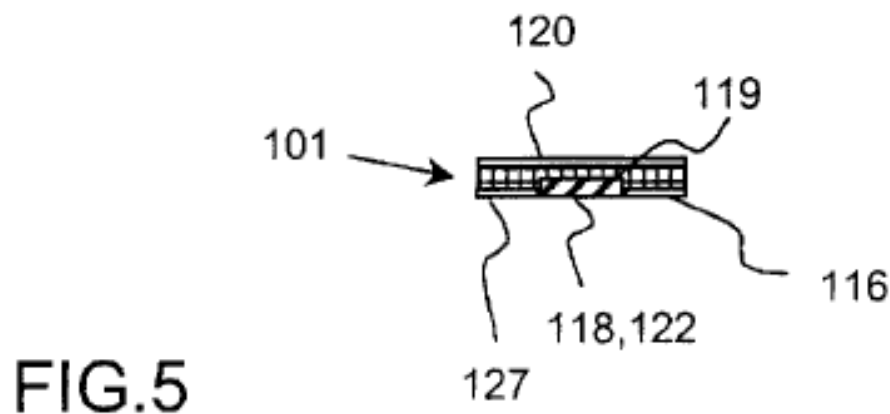


Figure 5 illustrates band-like component 101 of an electrode structure

for measuring an ECG signal on the skin of a person's chest.

Ex. 1006, code (57), 5:3–5, 5:16–17. Band-like component 101 illustrated in Figure 5 is preferably continuous band 101 having inner surface 116 against the skin of the person's chest and outer surface 120. Ex. 1006, 5:4–6. The electrodes 118, 122 of electrode structure 100 consist of membrane 119 that is located at both ends of the electrode structure 100, at electrode 118, 122, and is made of metal, electrically conductive plastic or a similar conductive material. *Id.* at 5:33–38. Electrodes 118, 122 at both ends of electrode structure 100 can be equal or narrower in width to band-like component 101. *Id.* at 5:38–39. Membrane 119 can come into contact with the person's skin surface 102. *Id.* at 5:39–41. In the alternative, there can be electrically conductive adhesive 127 on the inner surface 116 of membrane 119, which is against the person's skin. *Id.* at 5:41–43.

2. Independent Claim 1

a) Summary of Petitioner's Arguments

In attempting to account for limitations [1.c.i], [1.c.ii], and [1.c.iii]¹⁴ as a part of the Markel and Nissilä ground, Petitioner again emphasizes Markel's disclosure at paragraph 40 stating that an electrode “may be ***substantially concealed (or hidden) from a user . . . with little or no visible indication*** of the electrode.” Pet. 71 (quoting Ex. 1005 ¶ 40). Petitioner then contends the following:

¹⁴ In the Petition, Petitioner assesses limitations [1.c.i], [1.c.ii], and [1.c.iii] collectively as a part of its proposed Ground based on Markel and Nissilä. Pet. 71–74.

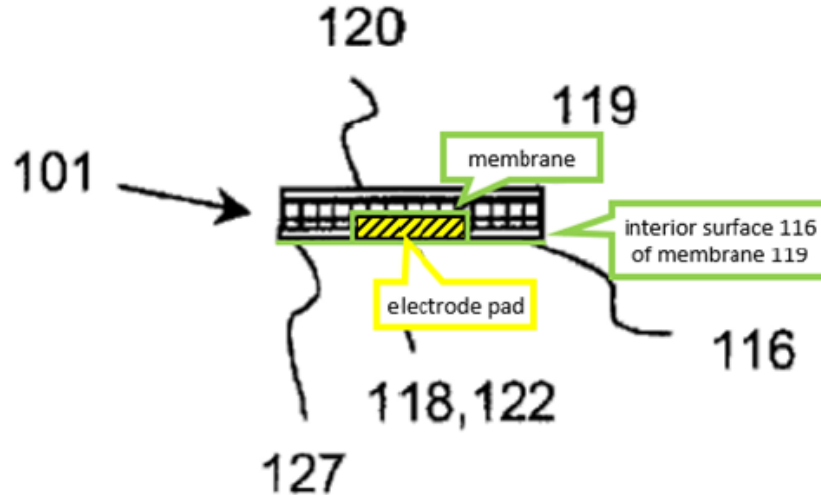
To the extent that a POSITA sought additional detail on how to implement *Markel*'s "hidden" electrode, that POSITA would have turned to *Nissilä*, which expressly teaches a cross-sectional view of an "improved electrode structure" having a pad that is positioned underneath the exterior surface of an enclosure (Ex. 1006, 2: 17-20, Fig. 5; Ex. 1003, ¶357). A POSITA would have combined the teachings of these references in order to accomplish construction of *Markel*'s "hidden" electrode (Ex. 1003, ¶357).

Pet. 71.

In expanding on the "additional detail" referenced above, Petitioner focuses heavily on three reference characters introduced in *Nissilä*, namely, 119, 118, and 122. *See* Pet. 71–76. Specifically, Petitioner points to *Nissilä*'s "membrane 119" as being a structure "that 'is made of metal, electrically conductive plastic or a similar conductive material.'" *Id.* at 71–72. Petitioner also points to "second electrode 122," that is said to constitute constituting an "electrode pad [that] is *underneath* the 'membrane 119,' which includes an 'exterior surface of the enclosure' and 'exterior surface of the first portion.'" *Id.* at 72 (citing Ex. 1003 ¶ 358).¹⁵ Petitioner provides the following annotated version of *Nissilä*'s Figure 5:

¹⁵ In assessing other limitations of claim 1 (i.e., limitations [1.d.i] and [1.d.ii], Petitioner makes similar representations as to "first electrode 118" as being allegedly enclosed by 'membrane 119.'" *See* Pet. 74–75.

Ex. 1006, Fig. 5 (annotated)



Pet. 72.

Figure 5 above, annotated by Petitioner, shows a cross-section of an electrode structure labeling, and emphasizing via green lines, a “membrane” and what is said to be “interior surface 116 of 119” as well as labeling, and emphasizing in yellow, what is said to be an “electrode pad” formed from electrodes 118 and 122. *See* Ex. 1006, 4:40; Pet. 72 (citing Ex. 1003 ¶ 358). Petitioner also subsequently characterizes surface 116 as an “exterior surface of the enclosure comprising an exterior surface of the first portion” in reasoning that membrane 119 would be in contact with the skin or a user for purposes of “detect[ing] a first electrical signal of the user’s cardiac signal[.]” Pet. 72–73 (citing 1003 ¶ 359). Noting that Nissilä describes its electrode structure as “inconspicuous,” Petitioner contends the following:

A POSITA would be motivated to combine *Nissilä*’s electrode structure with *Markel*’s electronic device in order to accomplish *Markel*’s stated goal of an electrode that is “***substantially concealed (or hidden) from a user . . . with little or no visible indication*** of the electrode presence” (Ex. 1005, [0040]; Ex. 1003, ¶355). *Markel*’s hidden electrode is desirable because it

increases aesthetics of the device while protecting the electrode from bumps or other damage (Ex. 1003, ¶354). Indeed, by concealing the electrode from the user, the user is able to obtain the benefits of having an ECG capability without a **visible indication** of the electrode presence that takes away from the device's appearance (Ex. 1003, ¶354).

Pet. 70–71.

In the Petition, Petitioner ultimately concludes that “*Markel* in view of *Nissilä* renders obvious claim elements [1.c.i], [1.c.ii], and [1.c.iii].” *Id.* at 74 (citing Ex. 1003 ¶ 361).

In its Reply, Petitioner reiterates its view that the Petition (Pet. 71–77) adequately accounts for each of elements [1.c.i], [1.c.ii], and [1.c.iii] (and also limitations [1.d.i]–[1.d.ii]) based on *Markel* and *Nissilä*, challenging Patent Owner's countervailing arguments in its Patent Owner Response as “misinterpretation” of *Nissilä*'s disclosure. Pet. Reply 15–21. Petitioner also maintains that a person of ordinary skill in the art would have had adequate motivation to modify *Markel* based on *Nissilä*'s teachings. *Id.* at 21–22.

b) Summary of Patent Owner's Arguments

Patent Owner disputes that Petitioner's ground based on *Markel* and *Nissilä* accounts for claim 1. *See* PO Resp. 39–59. In particular, Patent Owner argues that the ground “fails because, as with *Markel*, *Nissilä* includes no disclosure of a pad or electrode positioned **underneath** the exterior surface of a first portion of the enclosure of *Nissilä*'s device.” PO Resp. 39 (citing Ex. 2004 ¶¶ 102–132). Patent Owner further summarizes its view in that respect as follows:

All of AliveCor's assertions that *Nissilä* discloses a conductive membrane that is distinct from the electrode 118 or the electrode

122 and positioned between the electrode 118 or the electrode 122 and the skin of the user are based on nothing more than AliveCor's expert's unsupported assertions, using the claims of the '257 patent as a guide. To be clear, there is no disclosure anywhere in Nissilä of a separate membrane positioned between the electrodes 118 and 122 of Nissilä and the skin of the user wearing Nissilä's device.

Id. (citing Ex. 2004 ¶¶ 58, 105–106).

In further articulating its view, Patent Owner assesses:

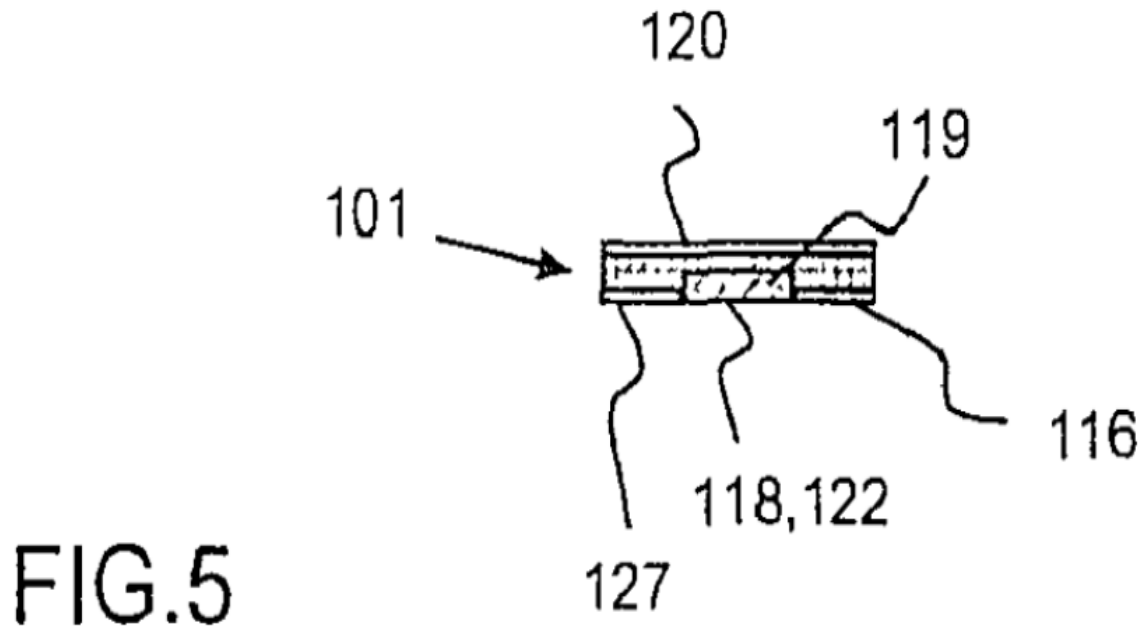
In stark contrast to AliveCor's assertions, what Nissilä actually discloses is that, in the embodiment of FIGs. 3-6 (the embodiment relied on by AliveCor in the Petition), each of the electrodes 118 and 122 is a membrane 119 made of metal, electrically conductive plastic or a similar conductive material.

Id. at 43 (citing Ex. 1006 5:32–49; Ex. 2013 (Dr. Berger's deposition testimony) 129:10–16)).

In that respect, Patent Owner advances the view that Nissilä does not describe membrane 119 as, itself, a separate structural component from electrodes 118 and 122, but rather, it is those electrodes that themselves, form or “consist of”¹⁶ the membrane 119. *See id.* at 47–48 (citing Ex. 1006, 5:33–38; Ex. 2004 ¶¶ 115–116). In further support of that view, Patent Owner also refers to, and reproduces in its Patent Owner Response, Figure 5 of a “Finnish patent to which Nissilä claims priority.” *Id.* at 48–49 (citing

¹⁶ We are cognizant of Patent Owner's contention that “consist of” or “consisting of” is language that is presumed to convey a particular understanding in patent law. *See, e.g.*, PO Resp. 46, 51; PO Sur-reply 25–27. We note generally that such understanding typically arises when the “consist of” or “consisting of” terminology appears in a patent claim and is a matter of claim construction, rather than, as here, in the specification of a patent and pertaining to assessing prior art disclosure. This Final Written Decision, and our resolution of the proceeding, does not depend on the particular understanding of “consist of” that is advocated by Patent Owner.

Ex. 2004 ¶¶ 118–119).¹⁷ Figure 5 of the Finnish patent as presented in the Patent Owner Response also is reproduced below:



APPLE-2006, FIG. 5.

PO Resp. 49.

Figure 5 from the Finnish patent shows an “electrode structure,” and resembles Figure 5 of Nissilä. Ex. 2006, 9:20; *compare* Ex. 1006, Fig. 5 with Ex. 2006, Fig. 5. Patent Owner submits that the Figures from the Finnish patent “confirm the disclosures of the specification that the electrodes 118 and 122 are made of or formed of an electrically conductive membrane, not enclosed by a separate membrane.” PO Resp. 48 (citing Ex. 2004 ¶¶ 118–119).

¹⁷ The identified Finnish patent (FI 119716 B) appears in the record as Exhibit 2006, with an English translation of that Finnish patent appearing as Exhibit 2007 (hereinafter “the Finnish patent”).

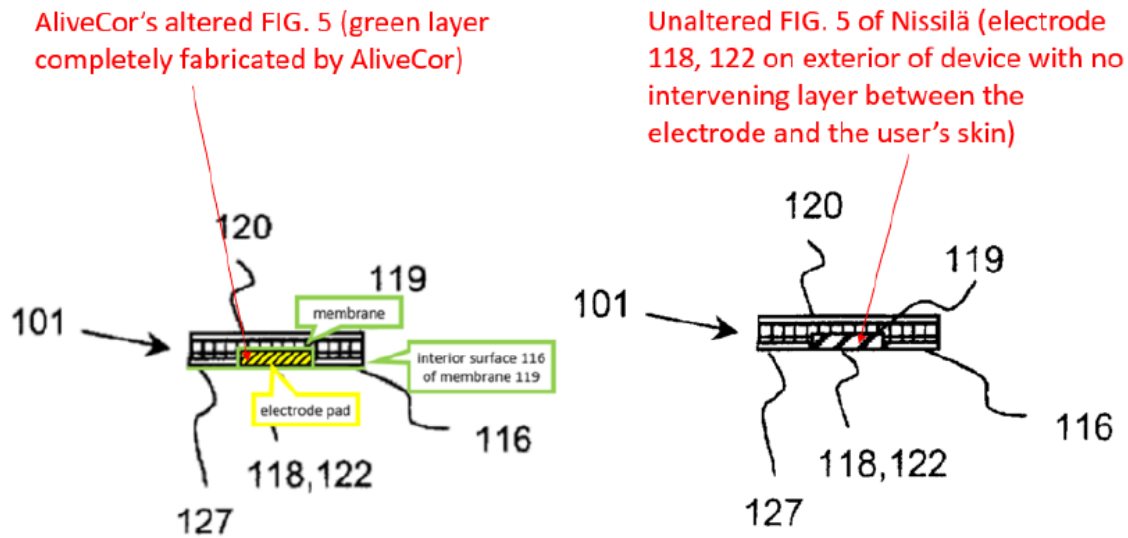
Patent Owner further contends that the “translation of the original source document” states “the electrodes 118, 122 of the electrode 100 *are formed of* an electrically conductive film 119 at the position of the electrodes 118, 122 at both ends of the electrode structure 100; for example, the film is metal, electrically conductive plastic, or a comparable electrically conductive material.” *Id.* at 49–50 (quoting Ex. 1007, 11:9–15). Patent Owner thus contends:

These disclosures of the original Finnish patent to which Nissilä claims priority once again demonstrate that discussion of the “membrane 119” in Nissilä (“film 119” in the original patent) is a description of the material used to make the electrodes 118, 122 and not a description of a second structure that is distinct from the electrodes.

Id. at 50 (citing Ex. 2004 ¶ 120).

Thus, Patent Owner points to the Finnish patent as supporting evidence for its view that Nissilä, via its Figure 5 and associated description, does not present its membrane as being a particular structure apart from electrodes 118 and 122.

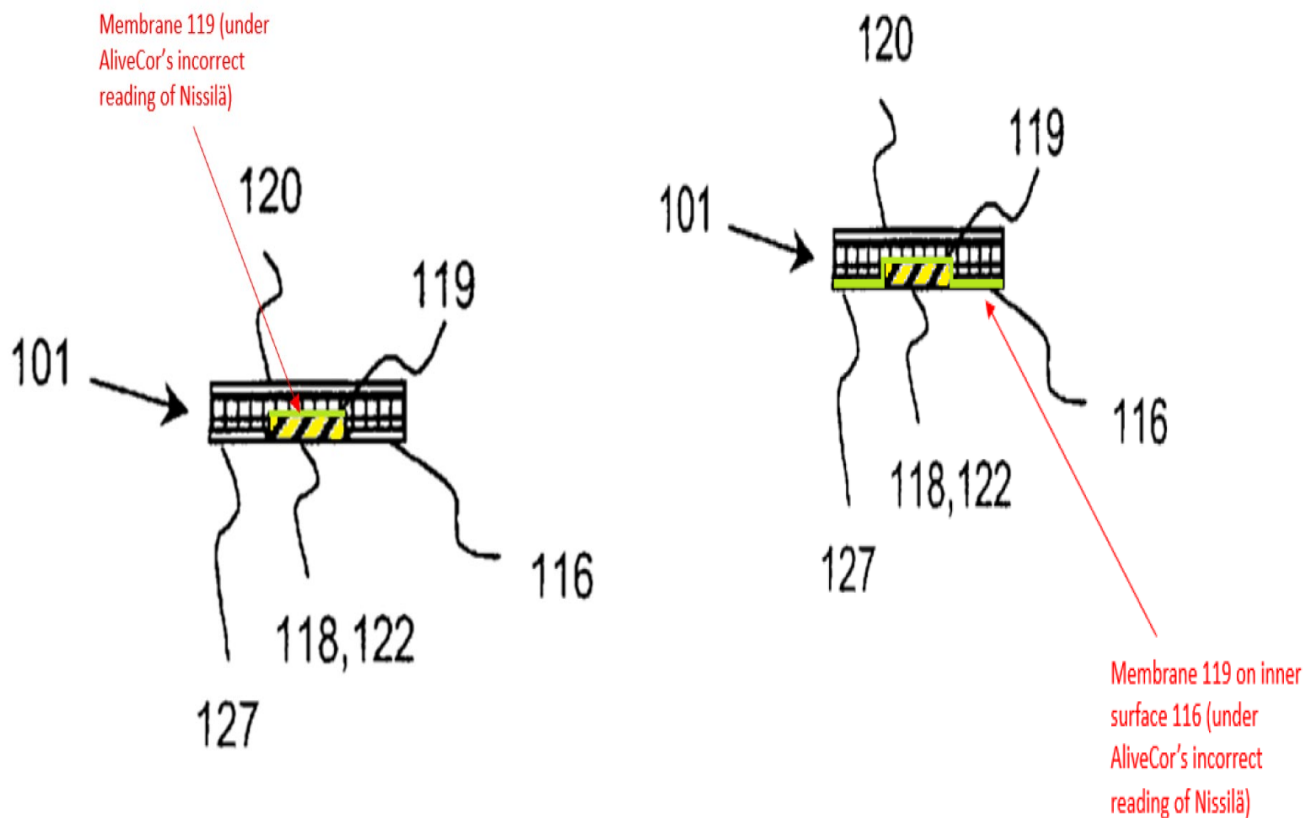
Patent Owner further discounts the annotated versions of Nissilä’s Figure 5 that appear in the Petition, characterizing them as “altered” and “completely fabricated” in presenting membrane 119 as a green line in a particular configuration with respect to electrodes 118 and 122. To that end, Patent Owner provides the following annotated reproductions of Figure 5:



PO Resp. 50.

As presented by Patent Owner, the versions of Figure 5 above show Petitioner's "altered" Figure 5 with "green layer completely fabricated[,]" and an "unaltered" Figure 5 with "electrode 118, 122 on exterior of device with no intervening layer between the electrode and the user's skin." *Id.*

Patent Owner also contends that even if membrane 119 is a separate component from electrodes 118 and 122, the membrane would not extend in the manner alleged in the Petition, i.e., underneath electrodes 118 and 122, and instead would appear in other configurations that do not reach the requirements of claim 1:



Pet. 54, 56.

The annotated Figures 5 above illustrate versions of Nissilä's electrode structure in which, in Patent Owner's view, even based on Petitioner's "incorrect reading of Nissilä" any separate membrane 119 (shown in green) does not form a layer "positioned between the electrodes 118, 122 and the skin of the wearer." *Id.* at 56 (citing Ex. 2004 ¶ 128).

Ultimately, Patent Owner contends that "there is no disclosure in Nissilä (or Markel) of 'wherein the first pad is positioned *underneath* the exterior surface of the first portion' of the enclosure, as required by element [1.c.iii]." PO Resp. 59 (citing Ex. 2004 ¶¶ 102–103, 110, 132); *see also* PO Sur-reply 21–25) (further arguing that Petitioner's understanding of Nissilä's membrane 119 configuration is incorrect).

Patent Owner additionally disputes that Petitioner has provided adequate motivation to combine the teachings of Markel and Nissilä. PO Resp. 59–67. The overarching reasoning in that regard is that one of ordinary skill in the art would not have sought to modify Markel’s own approach to concealing or hiding the electrodes of its device based on any teachings of Nissilä. *See id.*

c) Discussion—Claim 1

We have carefully considered the parties respective arguments and positions summarized above. We observe that the record is not a model of clarity in ascertaining just what Nissilä conveys as to the structural configuration of membrane 119, and its relationship vis-à-vis electrodes 118 and 122. To that end, we discern that, while there may be some record support for both parties’ contradictory assessments pertaining to the membrane 119, the structural makeup and configuration of the membrane that would be recognized by one of ordinary skill in the art, nevertheless, remains decidedly uncertain.

It is apparent from the Petition and the parties’ subsequent briefings, that the parties share an accord in the understanding that Petitioner’s relevant proposed ground necessitates that Nissilä’s membrane 119 extend underneath, and also surround, electrodes 118 and 122. The Petition is explicit in that regard. *See, e.g.*, Pet. 71–73 (citing Ex. 1003 ¶ 358). Indeed, Petitioner, and Dr. Berger, refer to an “electrode pad” that is “enclosed by ‘membrane 119’”, and, in doing so, thus urge that “the electrode pad is underneath the ‘membrane 119,’ which includes an ‘exterior surface of the enclosure’ and exterior surface of the first portion” as required by limitation [1.c.iii]. *Id.* at 72; Ex. 1003 ¶ 358. Both Petitioner and Dr. Berger proceed

to illustrate an annotated figure showing the alleged configuration of membrane 119 as covering the entirety of the bottom surface of the electrode structure shown in Nissilä's Figure 5 and also entirely surrounding each of electrodes 118 and 122. *See* Pet. 72; Ex. 1003 ¶ 358; *supra* § II.E.2.a (annotated Figure 5 reproduced).

Petitioner also seemingly relies on the above-noted particular configuration of membrane 119 to substantiate its position that a skilled artisan would have applied that particular membrane configuration to Markel's "audio output portion 610" to "accomplish[] *Markel's* stated goal of a 'hidden electrode'" *See* Pet. 73. Evidently, it is Petitioner's position that its proposed membrane configuration necessarily must enclose an electrode (e.g., either electrode 118 or 122), including along a bottom surface, in order to accomplish the hidden or concealment goal in Markel. *See id.*

In our view, however, it is quite tenuous on this record to conclude with any level of certainty that Petitioner and Dr. Berger accurately advance a view of the arrangement and positioning of membrane 119 that would have emerged from Nissilä's disclosure. Nissilä does not, itself, reasonably show or describe that its membrane 119 takes on any distinct structural characteristics of its own, much less the particular, and seemingly intricate, configuration of extending along the entire lower surface of the electrode structure shown in Figure 5 and also surrounding or enclosing electrodes 118 and 122 as alleged in Petitioner's annotated green lining of that Figure. *See, e.g.,* Pet. 72. We agree with Patent Owner (*see, e.g.,* PO Resp. 50), and credit Dr. Kenny's associated testimony (*see, e.g.,* Ex. 2004 ¶¶ 121, 123, 103–105), that the record at hand simply is inadequate to convey that the

proposed green lines presented by Petitioner and Dr. Berger to designate membrane 119's structure and arrangement appears fabricated in an attempt to reach the claims of the '257 patent rather than serving as a faithful adherence to what Nissilä would have relayed to a skilled artisan.

We are cognizant of Petitioner's argument that the use of different reference numerals usually demonstrates that identified structures are distinct. *See, e.g.,* Pet. Reply 17. Here, however, Patent Owner provides rational explanation with citation to Nissilä's disclosure that Nissilä does not adhere to any approach that different reference characters must identify different structures, and suggests that membrane 119, at times, is also used to identify electrodes 118 and 122. *See, e.g.,* PO Resp. 42–44; PO Sur-reply 22–25. Patent Owner also points to other record evidence including the Finnish patent (Exs, 2006, 2007) and the testimony of Dr. Kenny (Ex. 2004 ¶¶ 110–123) providing support for a view that Nissilä's membrane 119 identifies electrodes 118 and 122 rather than forming a layer that covers surfaces those electrodes. *See, e.g.,* PO Resp. 42–44, 47–52; Pet. Sur-reply 22–25.

Furthermore, Patent Owner and Dr. Kenny also present plausible explanation that, even if membrane 119 is a distinct structure, its arrangement with respect to electrodes 118 and 122 would be one that does not cover any surface of those electrodes that contacts a user's skin. *See, e.g.,* PO Resp. 54–56 (citing Ex. 2004 ¶¶ 127–128); *see also supra* § II.E.d.b) (reproduced annotated figures). Such configurations seemingly

also distance Petitioner's proposed ground from being viewed reasonably as accounting for limitations [1.c.i], [1.c.ii], and [1.c.iii].¹⁸

For the reasons set forth above, on this record, Patent Owner has presented credible evidence that casts significant aspersions on Petitioner's representations as to what is reasonably conveyed to a skilled artisan in connection with the structure and configuration of Nissilä's membrane 119. As a result, we find to be inadequate the evidentiary basis for Petitioner's proposal that Nissilä's membrane 119 is properly regarded as being a separate and distinct structure from electrodes 118 and 122, and specifically one that encloses those electrodes in the manner on which Petitioner relies. *See* Pet. 71–77. Furthermore, that finding also serves to challenge the propriety of the motivation to combine Markel and Nissilä, which relies on Petitioner's assessment of Nissilä's teachings in having electrodes 118 and 122 enclosed by membrane 119 in the particular configuration proposed in the Petition so as to facilitate the electrode concealment that Markel desires, but in a manner not contemplated by Markel. *See* Pet. 69–71, 73, 76.

d) Conclusion—Claim 1

A petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the petition (*Dynamic Drinkware*, 800 F.3d at 1378), and must do so by a preponderance of the evidence (35 U.S.C.

¹⁸ Although we have focused on the parties' positions as to the [1.c.i], [1.c.ii], and [1.c.iii] limitations, we note that Petitioner relies on similar assessment of the teachings of Nissilä in attempting to account for additional limitations of claim 1 (e.g., limitations [1.d.i] and [1.d.ii]). *See* Pet. 74–76. The deficiencies of Petitioner's ground discussed above are also applicable to those additional limitations.

§ 316(e)). On the record that has developed during trial, and after having weighed and considered the evidence supporting the parties' competing views as to the adequacy of Petitioner's proposed ground, we conclude that Petitioner has not carried its burden of persuasion because the evidence on which Petitioner relies does not meet the necessary threshold of showing by a "preponderance of the evidence" that claim 1 is unpatentable over Markel and Nissilä.

3. Dependent Claims 2–14

As noted above, claims 2–14 ultimately depend from independent claim 1, and thus incorporate all the requirements of claim 1. For the same reasons as those given above as to claim 1, we conclude that Petitioner has not shown by a preponderance of the evidence that claims 2–14 are unpatentable over Markel and Nissilä.

4. Claims 15–22

As discussed above (*see supra* §§ II.D.4–7), we conclude that Petitioner has shown by a preponderance of the evidence that claims 15–22 are unpatentable over Markel. We determine that it is unnecessary to reach the ground based on Markel and Nissilä proposed for claims 15–22. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding that a petitioner "is entitled to a final written decision addressing all of the claims it has challenged"); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that the "Board need not address issues that are not necessary to the resolution of the proceeding" and, thus, agreeing that the Board has "discretion to decline to

decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

F. Obviousness of Claims 12, 13, and 19 over Markel, Nissilä, and Righter

Petitioner contends that claims 12, 13, and 19 would have been obvious over Markel, Nissilä, and Righter. *See* Pet. 84–91.

With respect to claims 12 and 13,¹⁹ Petitioner does not rely on Righter’s teachings to make up for the deficiencies discussed above in connection with claim 1 based on Markel alone (*see supra* §§ II.D.2) or Markel taken with Nissilä (*see supra* §§ II.D.2, II.E.2). We also determine that Petitioner has not shown by a preponderance of the evidence that claims 12 and 13 are unpatentable over Markel, Nissilä, and Righter.

With respect to claim 19, Patent Owner raises some additional arguments as to potential deficiencies in Petitioner’s additional reliance on Righter’s teachings in accounting for limitations of that claim. *See, e.g.*, PO Resp. 74–76. As discussed above, however, we determine that Petitioner has shown by a preponderance of the evidence that claim 19 is unpatentable based on Markel. *See supra* § II.D.6. We, therefore, do not need reach the proposed ground of unpatentability for claim 19 that Petitioner additionally advances for that claim based on Markel, Nissilä, and Righter (Pet. 90–91). *See SAS*, 138 S. Ct. at 1359.; *Bos. Sci. Scimed*, 809 F. App’x at 990.

G. Patent Owner’s Revised Contingent Motion to Amend

Patent Owner filed a Contingent Motion to Amend. *See generally* Paper 19. Petitioner filed an Opposition to Patent Owner’s Contingent

¹⁹ Claims 12 and 13 each depend from claim 1.

Motion to Amend. *See generally* Paper 24. The Board issued Preliminary Guidance on Patent Owner’s Motion to Amend. *See generally* Paper 26. Patent Owner filed a Revised Contingent Motion to Amend. *See generally* Paper 29. Petitioner filed an Opposition to Patent Owner’s Revised Contingent Motion to Amend. *See generally* Paper 32. Patent Owner filed a Reply to Petitioner’s Opposition. *See generally* Paper 36. Petitioner filed a Sur-reply to Reply to Opposition to Patent Owner’s Contingent Motion to Amend. *See generally* Paper 38.

Patent Owner’s Revised Contingent Motion to Amend requests the following relief: “To the extent the Board finds any of claims 3 and/or 11–14 unpatentable, Apple respectfully requests that the Board grant this Revised Motion to Amend by entering at least the proposed claim(s) presented herein in substitution for the corresponding claim(s) found unpatentable, or in the alternative, that the Board grant this Revised Motion to Amend by entering each of the reasonable number of amended claims that are proposed herein.” Paper 29, 3. The Revised Contingent Motion to Amend seeks entry of claims 23–27 as substitutes claims in the event that claims 3 and 11–14 are determined to be unpatentable. Because, as discussed above, we determine that Petitioner has not established that any of claims 3 and 11–14 are unpatentable, the condition for assessing the Revised Contingent Motion to Amend has not materialized. The Motion, therefore, is moot.

III. CONCLUSION

In summary, we determine that Petitioner has not shown by a preponderance of the evidence that claims 1–14 of the ’257 patent are unpatentable, but has shown by a preponderance of the evidence that claims

15–22 are unpatentable. Those determinations are shown in the following table:²⁰

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–22	103	Markel	15–22	1–14
1–22	103	Markel, Nissilä ²¹		1–14
12, 13, 19	103	Markel, Nissilä, Righter ²²		12, 13

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in the Amendment	23–27
Substitute Claims: Motion to Amend Granted	

²⁰ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

²¹ We do not reach the ground advanced for claims 15–22 based on Markel and Nissilä because we determine that Petitioner accounts for those claims as a part of its ground involving Markel.

²² We do not reach the ground advanced for claim 19 based on Markel, Nissilä, and Righter because we determine that Petitioner accounts for claim 19 as a part of its ground involving Markel.

Motion to Amend Outcome	Claim(s)
Substitute Claims: Motion to Amend Denied	
Substitute Claims: Not Reached	23–27

IV. ORDER

It is

ORDERED that Petitioner has not shown by a preponderance of the evidence that claims 1–14 of U.S. Patent No. 10,076,257 B2 are unpatentable;

FURTHER ORDERED that Petitioner has shown by a preponderance of the evidence that claims 15–22 of U.S. Patent No. 10,076,257 B2 are unpatentable;

FURTHER ORDERED that Patent Owner's Revised Motion to Amend is *dismissed* as moot; 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.

IPR2023-00950
Patent 10,076,257 B2

FOR PETITIONER:

Christopher Douglas
Scott Stevens
J. Ravindra Fernando
Erin Beaton
ALSTON & BIRD LLP
christopher.douglas@alston.com
scott.stevens@alston.com
ravi.fernando@alston.com
erin.beaton@alston.com

FOR PATENT OWNER:

W. Karl Renner
Grace Kim
Jeremy Monaldo
Andrew Patrick
Patrick Bisenius
FISH & RICHARDSON P.C.
axf-ptab@fr.com
gkim@fr.com
jjm@fr.com
patrick@fr.com
bisenius@fr.com