

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*.

KINDER, Administrative Patent Judge.

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

I. INTRODUCTION

A. Background and Summary

AliveCor, Inc. (“Petitioner”)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”)² filed a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”). Petitioner filed a Preliminary Reply to Patent Owner’s Preliminary Response to the Petition. Paper 8 (“Prelim. Reply”). Patent Owner filed a Preliminary Sur-Reply to Petitioner’s Preliminary Reply to Patent Owner’s Preliminary Response to the Petition. Paper 11 (“Prelim. Sur-Reply”).

We have authority to determine whether to institute an *inter partes* review, under 35 U.S.C. § 314 and 37 C.F.R. § 42.4. An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that Petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”).

For the reasons provided below and based on the record before us, we determine that Petitioner has demonstrated a reasonable likelihood that Petitioner would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review on all grounds set forth in the Petition.

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.

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.

Petitioner also identifies the following related PTAB proceedings involving the '257 patent: *Masimo Corp. v. Apple Inc.*, IPR2023-00745 (“the 745 IPR”); *Masimo Corp. v. Apple Inc.*, IPR2024-00071. Paper 7 ¶ 1. Patent Owner also identifies that the Petitioner has filed a petition for IPR of the '257 patent under the case headings IPR2024-00169, which includes a conditional motion for joinder of the 745 IPR. Prelim. Sur-Reply 8; *see* IPR2024-00169, Paper 3, 1.

Petitioner has also filed petitions for IPR of patents related to the '257 patent: U.S. Patent No. 10,866,619 B1 (IPR2023-00948 and IPR2023-00949); U.S. Patent No. 10,270,898 B2 (IPR2023-01434); and U.S. Patent No. 10,568,533 B2 (IPR2024-00095). Paper 7 n.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, a

schematic view of an electronic device for receiving the output of one or more sensors, and in Figure 3, a schematic view of the elements (including integrated leads) of the electronic device. *Id.* at 3:22–29.

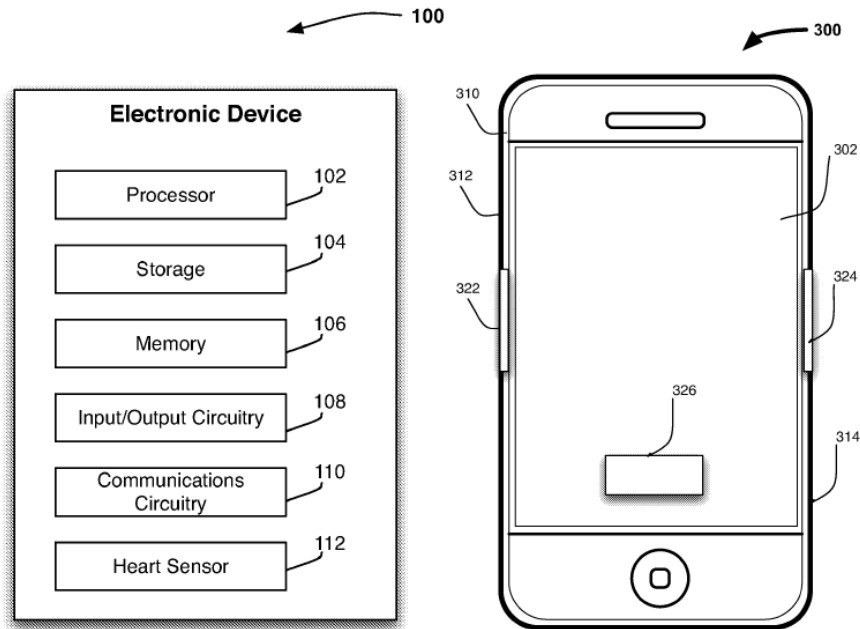


FIG. 1

FIG. 3

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 elements of such an electronic device having several integrated leads. *Ex.* 1001, 3:47–49, 8:13–16, Figs. 1, 3.

As shown in Figure 1, electronic device 100 includes control circuitry 102, storage 104, memory 106, input/output circuitry 108, communications circuitry 110, and heart sensor 112. *Ex.* 1001, 3:49–61. Control circuitry 102 includes processing circuitry or a processor operative to control the operations and performance of electronic device 100. *Id.* at 3:62–4:2. 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.* Input/output circuitry 108 is operative to convert analog signals and

other signals into digital data, and digital data into any other type of signal. *Id.* at 4:32–46. Input/output circuitry 108 may receive and convert physical contact inputs (e.g., from a multi-touch screen), physical movements (e.g., from a mouse or sensor), analog audio signals (e.g., from a microphone), or other input. *Id.* The digital data may be provided to, and received from, processor 102, storage 104, memory 106, heart sensor 112, or other component of electronic device 100. *Id.* Heart sensor 112 is operative to detect a user's heartbeat, heart rate, or other signal generated by the user's heart. *Id.* at 6:3–16. Thus, heart sensor 112 may serve as an EKG monitor. *Id.* 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.* The leads may be integrated in any suitable portion of the electronic device. *Id.* at 8:10–13. Figure 3 illustrates an electronic device having such integrated leads. *Id.* at 8:13–15. 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.

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. Ex. 1001, 8:15–40. 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.* 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.* 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.*

Electronic device 300 may also “include additional lead 326 embedded in or behind display 302,” as shown in Figure 3. Ex. 1001, 8:40–52. 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.* 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.*

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). Ex. 1001, 8:53–60.

The '257 patent explains that 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. Ex. 1001, 8:59–9:3. 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.* In accordance with the '257 patent, this may allow leads 322 and 324 to be embedded directly in bezel 310 without the need for additional isolating material. *Id.*

Figures 4A and 4B of the '257 patent, reproduced below, illustrate electronic devices having bezels with embedded heart sensor leads. Ex. 1001, 3:30–36.

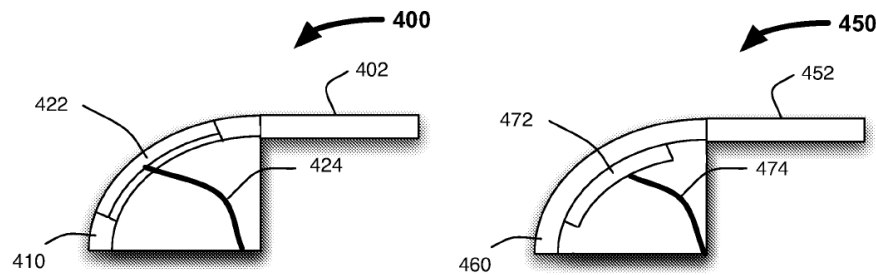


FIG. 4A

FIG. 4B

Figure 4A is a cross-sectional view of an electronic device 400 having a bezel 410 with an embedded heart sensor lead 422, and Figure 4B is a cross-sectional view of another electronic device 450 having a bezel 460 with an embedded heart sensor lead 472. Ex. 1001, 9:18–21, 9:35–40, Figs. 4A, 4B.

Electronic device 400 shown in Figure 4A includes display 402 and bezel 410. Ex. 1001, 9:18–35. Lead 422 may be embedded along the outer surface of bezel 410 such that lead 422 is exposed to the user during use. *Id.* 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.* Electronic device 400 may further include an isolating layer positioned between lead 422 and bezel 410 (not shown in Figure 4A). *Id.* The isolating layer may be constructed from a suitable material having non-conductive properties. *Id.* 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.*

Electronic device 450 in Figure 4B includes display 452 and bezel 460. Ex. 1001, 9:36–56. 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.* 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.* 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.* 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.*

D. Illustrative Claim

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

1. An electronic device for detecting a user's cardiac signal, comprising:
 - an enclosure;
 - a heart sensor configured to detect the user's cardiac signal, the heart sensor comprising:
 - a first lead comprising 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, 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; and

a second lead comprising a second pad that is embedded in a second portion of the enclosure, 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

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 uniquely requires “a display screen,” and “a second lead embedded in the display screen.” Ex. 1001, 14:1, 14:11.

E. Evidence

Petitioner relies on the following references (Pet. 6):

Name	Reference	Exhibit(s)
Markel	US 2007/0021677 A1, pub. Jan. 25, 2007	1005
Nissilä ³	US 6,775,566 B2, iss. Aug. 10, 2004	1006
Righter	US 5,191,891, iss. Mar. 9, 1993	1007

³ At times the parties refer to the reference as “Nissila.”

Petitioner also relies on the declaration of Ronald D. Berger, M.D., Ph.D., F.H.R.S. (Ex. 1003) in support of its arguments. Petitioner also relies on other exhibits as discussed below. Patent Owner relies on the declaration of Thomas Kenny, Ph.D (Ex. 2001) in support of its arguments.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

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).

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

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.

invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4), if present, any objective evidence of obviousness or non-obviousness. *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 that:

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. More education can supplement practical experience and vice versa.

Pet. 6–7 (citing Ex. 1003 ¶ 38).

Patent Owner, in turn, contends that:

The POSITA of the '257 Patent would have had at 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.

Prelim. Resp. 61 (citing Ex. 2001 ¶¶ 42–43).

The parties' recitations are similar in scope. Patent Owner's proposed level of ordinary skill in the art is somewhat broader in education.

Petitioner's definition is consistent with both the scope of the claimed invention and 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). For purposes of this decision, we apply Petitioner's definition of the person of ordinary skill in the art. We note, however, that our decision would be the same adopting either proposed level of ordinary skill in the art.

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 1312–1313. “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).

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 “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.

Patent Owner, at this time, “discerns no need to construe explicitly any claim language because doing so would have no effect on analyses of AliveCor’s asserted grounds, and would not assist in resolving the present controversy between the parties.” Prelim. Resp. 59–60 (citing Ex. 2001 ¶¶ 44–45).

With respect to the preamble “[a]n electronic device for detecting a user’s cardiac signal,” as recited in elements [1.pre] and [15.pre], Petitioner submits that the language

provides antecedent basis that defines language in the claim body. For example, [1.pre] and [15.pre] each recite “*a* user’s cardiac signal,” which is referred back to later in the claim bodies as “*the* user’s cardiac signal” . . . The phrase “a user” in [1.pre] and [15.pre] is referred back to in the claim bodies as part of “*the*

user’s skin’s contact” . . . As another example, [15.pre] recites “An electronic device,” which is referred back to later in the claim body as “*the* electronic device” . . . Consequently, a person of ordinary skill in the art would have understood that the language “An electronic device for detecting a user’s cardiac signal” in [1.pre] and [15.pre] is limiting and should receive its plain and ordinary meaning.

Pet. 5 (citing Ex. 1003 ¶ 77). We find Petitioner’s contentions with respect to the preamble of claims 1 and 15 persuasive. Petitioner has shown that the claim preamble, when read in the context of the entire claim, recites limitations of the claim, and is necessary to give life, meaning, and vitality to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999).

Petitioner considers the claim term “lead,” and submits that:

A POSITA would have understood the plain and ordinary meaning of ‘lead’ to include (1) an electrode that comes into contact with a user and (2) the electrical connection (*e.g.*, wires) that connects the electrode to additional electronics that implement that ECG signal acquisition.

Pet. 11 (citing Ex. 1003 ¶ 116).

With respect to the claim term “pad,” Petitioner submits that an ordinarily skilled artisan “would have understood that a ‘pad’ is a component of the electrode.” Pet. 11 (citing Ex. 1003 ¶ 116).

Next, Petitioner examines claim element [1.c.iii], which recites “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.” Petitioner contends that Patent Owner’s construction for “purposes of showing alleged infringement . . . appears to have interpreted [1.c.ii] [sic] to include the

surface of an exposed electrode pad that is configured to detect a cardiac signal via direct contact with the user's skin." Pet. 16 (citing Ex. 1003 ¶¶ 127–128). Alternatively, Petitioner appears to construe the claim element [1.c.iii] under its plain and ordinary meaning requiring that the pad is underneath the surface. Pet. 19–20 (citing Ex. 1003 ¶ 134).

With respect to the claim element [7.a], which recites “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,” Petitioner submits that element [7.a] should be construed based on the language of [6.c], which defines the term “the second conductivity.” Pet. 39. Petitioner submits that “the plain and ordinary meaning of [7.a] requires positioning the first pad and the second pad ‘at a distance larger than’ the distance that the second electrical signal can be transmitted.” *Id.* (citing Ex. 1003 ¶ 216).

With respect to the claim term “bezel,” Petitioner submits that a “POSITA would have understood the plain and ordinary meaning of ‘bezel’ to include a rim that encircles an electronic device.” Pet. 47 (citing Ex. 1001, Fig. 3; Ex. 1003 ¶ 249); *see also* Pet. 87, 89.

Although Petitioner's proposed claim constructions appear reasonable and supported, based on the current record before us, including the absence of any opposition from Patent Owner, we see no need for express construction of any additional term at this stage of the proceeding. For purposes of this decision, and based on the record before us, we determine that no additional express construction is necessary except for those set forth. *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 opposes. Prelim. Resp. 34–48. As we preliminarily conclude below that Petitioner demonstrates a reasonable likelihood of prevailing with respect to its obviousness challenge to independent claim 1 as rendered obvious based on ground 2 (Markel and Nissilä), we institute review on all challenged claims on all grounds set forth in the Petition, including this obviousness challenge based on Markel.

1. 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.* at ¶ 6.

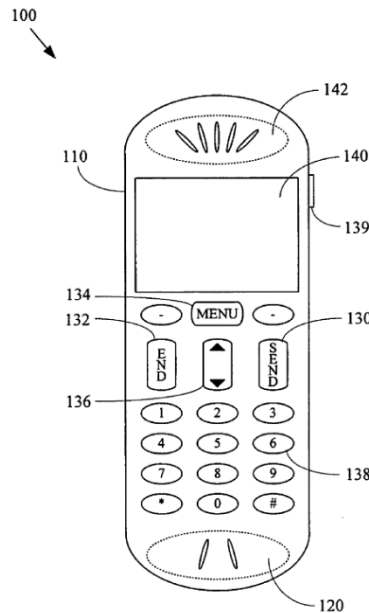


Figure 1

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 a main body portion 110, user input features (including a microphone 120), user output features (including a display 140 that may also function as a touch screen input feature, and a speaker 142), and pushbuttons (such as a send button 130, an end button 132, a menu button 134, a scroll button 136, a numeric button 138 and a 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 may also be formed from conductive plastic (or another material) that may be integrated into various molded components of the mobile communication device. *Id.* Electrodes may also 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 include molded conductive plastic with little or no visible indication of the electrode presence. *Id.* ¶ 39.

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. Such normal use may include talking on a telephone, reading messages, perusing a phone book, typing a message, initiating a phone call, sending an email message, or entering information in a notepad. *Id.* For example, an electrode may be disposed on a pushbutton of MCD 100. *Id.* ¶ 42. As illustrated in Figure 1, an electrode may be disposed on alphanumeric pushbuttons (e.g., pushbutton 138), or on a send button 130, an end button 132, a menu button 134, a scroll button 136, or a volume control button 139. *Id.* An electrode may also be placed on a main body portion 110 of MCD 100. *Id.* ¶ 43. For example, main body portion 110 may include the portion of MCD 100 that is generally held in the hand during normal use of MCD 100. *Id.* One or more electrodes may also be placed on side or rear portions of main body portion 100. *Id.* An electrode may also be placed on (or proximate to) an audio output portion 142 (e.g., a speaker) of MCD 100, or on video display device 140. *Id.* ¶ 44.

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

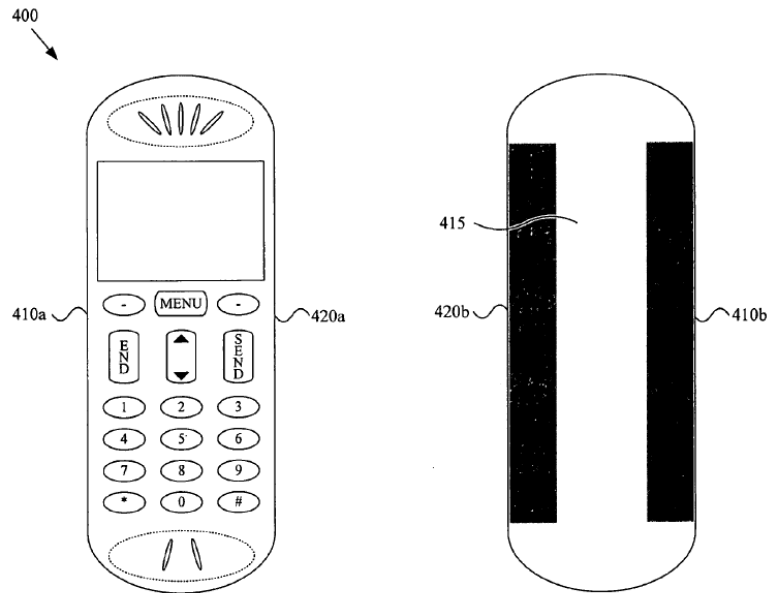


Figure 4

Figure 4 of Markel 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 a left side portion 410 and a right-side portion 420, with a first electrode placed on left side portion 410 (e.g., placed on or molded into region 410b), and a second electrode placed on right side portion 420 (e.g., placed on or molded into region 420b). *Id.* In a case where regions 410b and 420b include conductive plastic, an insulating region 415 may separate regions 410b and 420b. *Id.*

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

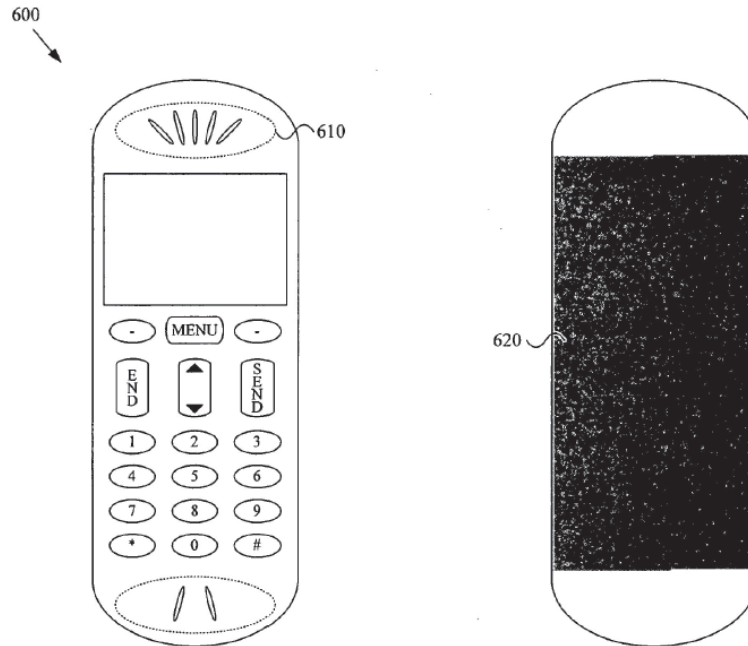


Figure 6

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 an audio output portion 610 and a main body portion 620, with a first electrode placed on the 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 illustrates portions of an MCD 1000 including 2 or more electrodes. Ex. 1005 ¶¶ 15, 58.

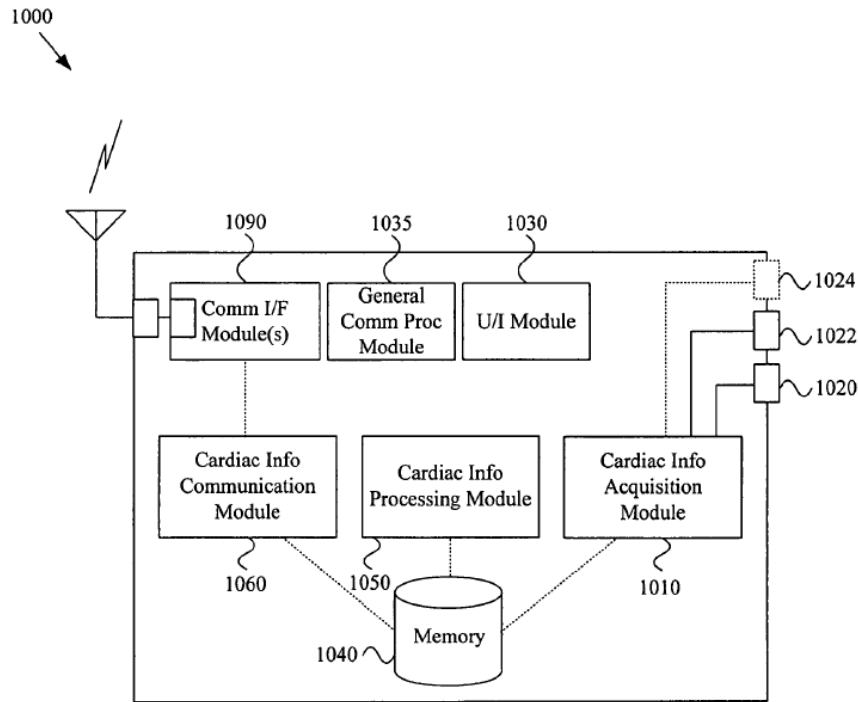


Figure 10

Figure 10 of Markel illustrates portions of an MCD 1000 including 2 or more electrodes. Ex. 1005 ¶¶ 15, 58.

MCD 1000 illustrated in Figure 10 includes a first electrode 1020 and a second electrode 1022 (and, for example, a third or Nth 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.* Cardiac information acquisition module 1010 stores the acquired cardiac information in memory 1040. *Id.* ¶ 59. MCD 1000 may further include: a cardiac information processing module 1050 that processes acquired cardiac information; a cardiac information communication module 1060 that communicates acquired cardiac information or analysis results to another system; a U/I

module 1030; a general communication processing module 135; and communication interface module(s) 1090. *Id.*

2. Independent Claim 1.

Petitioner presents contentions that claim 1 would have been obvious over the teachings of Markel. Pet. 7–29. Patent Owner opposes. Prelim. Resp. 37–48.

*[1.pre]*⁵ “An electronic device for detecting a user’s cardiac signal, comprising:”

Petitioner argues that Markel renders obvious this limitation. Pet. 7 (citing Ex. 1003 ¶¶ 102–107). As noted above, and based on the record before us, “[a]n electronic device for detecting a user’s cardiac signal” is limiting. *See* Ex. 1003 ¶¶ 75–77.

Petitioner argues Markel discloses an electronic device for detecting a user’s cardiac signal. *Id.* at 7–8 (citing Ex. 1003 ¶¶ 102–107; Ex. 1005, code (57), ¶¶ 4, 6, 33, 60, 80, 99, 125, 154, Fig. 1, 4–9). On this record, the cited evidence supports Petitioner’s undisputed contention that Markel discloses limitation [1.pre]. Accordingly, for the foregoing reasons and on this preliminary record, Markel supports Petitioner’s contentions.

[1.a] “an enclosure;”

Petitioner argues that Markel renders obvious this limitation. Pet. 8 (citing Ex. 1003 ¶¶ 108–110; Ex. 1005, Fig. 1, 4, 6). Petitioner argues that Markel discloses an enclosure in the form of Markel’s main body portion 110. *Id.* at 8–9 (citing Ex. 1003 ¶¶ 108–110; Ex. 1005 ¶¶ 34, 43, 53–54, 56, 64, 76–77, Figs. 1, 4, 6). On this record, the cited evidence supports Petitioner’s undisputed contention that Markel discloses this limitation.

⁵ We use the bracketed designations added by Petitioner (*see* Pet. 7–29).

Accordingly, for the foregoing reasons and on this preliminary record, Markel supports Petitioner's contentions.

[1.b] "a heart sensor configured to detect the user's cardiac signal,"

Petitioner argues that Markel renders obvious this limitation. Pet. 9 (citing Ex. 1003 ¶¶ 111–114; Ex. 1005, Fig. 10). Petitioner argues that Markel discloses, *inter alia*, such a heart sensor because electrodes 1020, 1022, 1024 are used "to detect and **acquire various cardiac (i.e., heart-related) signals from a user.**" Pet. 9–10 (citing Ex. 1003 ¶¶ 111–114; Ex. 1005 ¶¶ 35, 58, 60, Fig. 10). On this record, the cited evidence supports Petitioner's undisputed contention that Markel discloses this limitation. Accordingly, for the foregoing reasons and on this preliminary record, Markel supports Petitioner's contentions.

[1.c.i] "the heart sensor comprising: a first lead comprising a first pad that is embedded in a first portion of the enclosure,"

Petitioner argues that Markel renders obvious this limitation. Pet. 10 (citing Ex. 1003 ¶¶ 115–121; Ex. 1005, Fig. 6). Petitioner argues that "[a] POSITA would have understood the plain and ordinary meaning of 'lead' to include (1) an electrode that comes into contact with a user and (2) the electrical connection (*e.g.*, wires) that connects the electrode to additional electronics that implement that ECG signal acquisition." *Id.* at 11 (citing Ex. 1003 ¶ 116). Petitioner argues Markel discloses such a first lead because Markel's second electrode 22 and associated wiring "is 'coupled' to the cardiac information acquisition module" and "is '**molded into the audio output portion 610** or positioned on the main body portion 610' of the electronic device." *Id.* at 11–13 (citing Ex. 1003 ¶¶ 118–119; Ex. 1005 ¶¶ 50, 5859, Fig. 10). Petitioner argues that "[a] POSITA would have

understood that a ‘pad’ is a component of the electrode.” Pet. 11 (citing Ex. 1003 ¶ 116).

Petitioner argues additionally that Markel’s “‘second electrode’ may be ‘placed on the right side portion 420 (e.g., placed on or *molded into region* 420*b*).” *Id.* at 13 (citing Ex. 1003 ¶ 120; Ex. 1005 ¶ 45). Petitioner further argues that one of ordinary skill in the art would “have understood that Figure 4’s ‘second electrode’ would include a first pad that is embedded into the ‘right side portion 420,’ (i.e., a first portion of the enclosure) in the Figure 4 configuration.” *Id.* at 13 (citing Ex. 1003 ¶ 120; Ex. 1005 ¶ 45); *see also id.* at 14 (citing Ex. 1005, Fig. 4).

[1.c.ii] “wherein an exterior surface of the enclosure comprises an exterior surface of the first portion”

Petitioner argues that Markel renders obvious this limitation. Pet. 14 (citing Ex. 1003 ¶¶ 122–125; Ex. 1005, Fig. 6). First, Petitioner argues Markel discloses this limitation because “a POSITA would have understood that the exterior surface of the ‘audio output portion 610’ corresponds to the ‘exterior surface of the first portion’ of [1.c.ii].” *Id.* at 14–15 (citing Ex. 1003 ¶ 123; Ex. 1005, Fig. 6). Second, Petitioner further argues that “[a] POSITA would have understood that the exterior surface of the ‘right side portion 420’ corresponds to the ‘exterior surface of the first portion’ of [1.c.ii] in the Figure 4 configuration.” *Id.* at 15–16 (citing Ex. 1003 ¶ 124).

[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;”

Petitioner argues that Markel renders obvious this limitation. Pet. 16 (citing Ex. 1003 ¶¶ 126–140). Patent Owner opposes. Prelim. Resp. 34–48.

“Apple’s interpretation”

Petitioner argues Markel discloses this limitation under an interpretation of [1.c.iii] that corresponds to Markel’s surface of an exposed electrode pad that is configured to detect a cardiac signal via direct contact with the user’s skin. Pet. 16 (citing Ex. 1003 ¶¶ 127–128).

First, Petitioner argues that Markel’s Figure 6 shows that “the second electrode is *‘positioned on the audio output portion 610’* of the electronic device” to “provide for *user contact*’ with the second electrode ‘during the process of listening’ to the electronic device.” *Id.* at 17 (citing Ex. 1003 ¶ 129; Ex. 1005 ¶¶ 44, 50). Second, Petitioner argues that Markel’s Figure 4 shows that “the second electrode is *‘placed on the right side portion 420’* of the electronic device . . . Such electrode placement allows the electrode to *‘contact a user* during normal (or typical) use of the [electronic device].” *Id.* at 18 (citing Ex. 1003 ¶ 131; Ex. 1005 ¶¶ 41, 45). Petitioner further argues that the electrodes include a metallic surface that detects cardiac activity via direct contact with the user’s skin. *Id.* at 19 (citing Ex. 1003 ¶¶ 132–133; Ex. 1005 ¶¶ 35, 37).

Patent Owner summarizes Markel’s disclosure and opposes Petitioner’s arguments. Prelim. Resp. 34–38, 45 (citing Ex. 2001 ¶¶ 52–56, 67–71). Patent Owner argues Petitioner has failed to demonstrate that

Markel discloses or suggests limitation [1.c.iii] and that Petitioner “relies improperly upon the mapping of a single prior art component to two distinct features of claim 1.” *Id.* at 46. Patent Owner argues that claim 1 recites that “the enclosure and the heart sensor are two distinct components” but that Petitioner improperly maps both components to either the “right side portion 420” or the “audio output portion 610.” *Id.* at 47 (citing Ex. 2001 ¶ 71). Patent Owner additionally argues that Petitioner improperly mapped a single claim component to two distinct components of an invention and that Petitioner improperly relies on a claim interpretation that is incorrect. Prelim. Resp. 47–48.

Petitioner suggests the broader interpretation relied on above is not correct. *See* Pet. 16–19 (labeling the other interpretation as the “Correct interpretation”); Ex. 1003 ¶ 127 (“Under Apple’s own interpretation . . . (with which I disagree).”). At this stage of the proceeding, we are reluctant to adopt a claim interpretation that Petitioner says is incorrect and Patent Owner does not address or adopt. On this record, we also question whether it is proper for the Petitioner to interpret “the first pad is positioned underneath the exterior surface of the first portion” as corresponding to Markel’s electrode that detects the cardiac signal via *direct contact* with the user.

Further, on this preliminary record, Patent Owner’s contention that Petitioner’s broader interpretation fails because “it relies improperly upon the mapping of a single prior art component to two distinct features of claim 1” is somewhat convincing. Prelim. Resp. 46–47 (“In both of its mappings, AliveCor improperly addresses two distinct features of claim 1—i.e., ‘first pad’ and ‘exterior surface of the first portion’—with the same

component in Markel—i.e., an ‘audio output portion 610’ or ‘the right side portion 420’ in Markel”). We will make a final determination of the issues raised by Patent Owner upon a complete record.

AliveCor’s Alleged “Correct interpretation”

Petitioner argues Markel discloses this limitation under an interpretation of [1.c.iii] in which the pad is underneath the exterior surface. Pet. 19 (citing Ex. 1003 ¶ 134). Petitioner argues Markel discloses this limitation by teaching that “an electrode ‘may be ***substantially concealed (or hidden) from a user . . . with little or no visible indication*** of the electrode presence.” *Id.* at 20 (citing Ex. 1003 ¶ 135; Ex. 1005 ¶ 40).

According to Petitioner, one of ordinary skill in the art would have been motivated to modify Markel to place the pad of an electrode “*underneath* the conductive plastic of the ‘audio output portion’” to substantially conceal or hide “the electrode pad from the user, which would have been desirable to increase the device’s aesthetics while protecting the electrode.” *Id.* (citing Ex. 1003 ¶ 135). Petitioner further contends that the electrode does not need to be in direct contact with a user. Pet. 20 (citing Ex. 1003 ¶ 136; Ex. 1005 ¶ 35). Petitioner argues that one of ordinary skill in the art would recognize that the electrode can be conductively coupled to a user through an intermediate conductive material. *Id.* (citing Ex. 1003 ¶ 136; Ex. 1005 ¶ 37).

Petitioner argues that one of ordinary skill would have had a reasonable expectation of success detecting a cardiac signal via the conductive plastic. Pet. 21 (citing Ex. 1003 ¶¶ 137–138; Ex. 1005 ¶¶ 35, 37, 45). Similarly, Petitioner argues 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.’” *Id.* at 21 (citing Ex. 1003 ¶ 139).

Patent Owner contends Petitioner has failed to demonstrate that Markel discloses or suggests limitation [1.c.iii]. Patent Owner argues that “Markel does not suggest concealing an electrode *underneath* the exterior surface of the device.” Prelim. Resp. 37 (citing Ex. 2001 ¶¶ 72–84). Patent Owner argues that “Markel does not disclose or suggest placing an electrode pad *underneath* an enclosure of a device.” *Id.* at 39 (citing Ex. 2001 ¶¶ 72–73). More specifically, Patent Owner contends that “it is impossible for an electrode, as alleged by AliveCor, to be *underneath* the conductive material when the electrode itself is *made of that same* conductive material.” *Id.* Patent Owner contends that Markel discloses that either the electrode can be identifiable with visible or tactile characteristics or it can be concealed by being made out of conductive plastic. *Id.* at 39–41 (citing Ex. 1005 ¶¶ 37, 39, 40, 47; Ex. 2001 ¶¶ 75–78).

Patent Owner additionally argues that Petitioner has not established why a person of ordinary skill in the art would modify Markel’s device to place an electrode underneath an exterior layer when the electrode is already concealed. Prelim. Resp. 41–42 (citing Ex. 1005 ¶ 40; Ex. 2001 ¶¶ 78–80). Patent Owner argues Markel’s device instead discloses exposing the electrodes on the exterior surface of the device to enable a user to contact them. *Id.* at 42–44 (citing Ex. 1005 ¶¶ 33–34, 42, 45–46, 50; Ex. 2001 ¶¶ 81–83).

We are not fully convinced that Markel’s disclosure that an electrode may be substantially concealed from a user with no visible indication suggests Petitioner’s proposed modification to place the pad of an electrode

underneath the conductive plastic. Whether an electrode may be considered underneath the conductive material when the electrode itself is made of that same conductive material is an issue we will decide upon the final record.

We also question whether Petitioner’s motivation for placing the pad of the electrode underneath the conductive plastic – “to increase the device’s aesthetics while protecting the electrode” – is a sufficient basis or reason to modify Markel. For example, Markel’s teaching of concealing electrodes relates to “having the electrode made of ‘*molded conductive plastic with little or no visible indication of the electrode presence,*’” which concerns concealment through use of conductive plastic and not necessarily placement underneath a conductive plastic layer. Prelim. Resp. 40–41 (quoting Ex. 1005 ¶ 40). For the reasons set forth above, we question whether Petitioner has established persuasively that a person of ordinary skill in the art would be motivated to modify Markel to place the electrode underneath the conductive material to satisfy this limitation.

Accordingly, for the reasons set forth above, we question whether Petitioner has sufficiently shown by a reasonable likelihood that Markel renders obvious this limitation. Because we determine below that Petitioner has sufficiently shown a reasonable likelihood that it would prevail in its contentions regarding claim 1 based on ground 2 (Markel combined with Nissilä), we decline to reach an affirmative conclusion based on this ground.

[1.d.i] “the heart sensor comprising: . . . a second lead comprising a second pad that is embedded in a second portion of the enclosure,”

Petitioner argues that Markel renders obvious this limitation. Pet. 22 (citing Ex. 1003 ¶¶ 141–147; Ex. 1005, Fig. 6). Petitioner argues Markel discloses components that correspond to this limitation. *Id.* (citing Ex. 1003

¶ 143; Ex. 1005, Fig. 6). Petitioner argues that Markel discloses a “first electrode 1020” that is coupled to a cardiac acquisition module. *Id.* at 23 (citing Ex. 1003 ¶ 144; Ex. 1005 ¶¶ 58–59, Fig. 10). According to Petitioner, “[a] POSITA would . . . have understood that *Markel*’s ‘first electrode’ and associated wiring is a ‘second lead.’” *Id.* (citing Ex. 1003 ¶ 144).

Petitioner argues that “[i]n *Markel*’s Figure 6, the ‘first electrode’ is ‘disposed on the main body portion 620 (e.g., ***molded into the main body portion 620 or positioned on the main body portion 620***).’” Pet. 23 (citing Ex. 1003 ¶ 145; Ex. 1005 ¶ 50, Fig. 6). According to Petitioner, “[a] POSITA would . . . have understood that *Markel*’s ‘first electrode’ comprises a second pad that is ‘molded into the main body portion 620,’ (i.e., embedded in a second portion of the enclosure).” *Id.* at 23–24 (citing Ex. 1003 ¶ 145).

Additionally, Petitioner argues that Markel discloses “a configuration in Figure 4 wherein the ‘first electrode’ is ‘placed on the left side portion 410 (e.g., ***placed on or molded into region 410b***).’” Pet. 24 (citing Ex. 1003 ¶ 146; Ex. 1005 ¶ 45, Fig. 4). According to Petitioner, “[a] POSITA would thus have understood that Figure 4’s ‘first electrode’ would include a second pad that is embedded into the ‘left side portion 410,’ (i.e., a second portion of the enclosure).” *Id.* (citing Ex. 1003 ¶ 146).

[I.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;”

Petitioner argues that Markel renders obvious this limitation. Pet. 25 (citing Ex. 1003 ¶¶ 148–157; Ex. 1005, Fig. 6). Petitioner argues that Markel discloses an enclosure in the form of Markel’s main body portion

110. *Id.* at 26 (citing Ex. 1003 ¶¶ 149, 151). According to Petitioner, “a POSITA would have understood that *Markel*’s ‘first electrode’ is embedded in the ‘main body portion 620’ (i.e., a second portion of the enclosure).” *Id.* (citing Ex. 1003 ¶ 149).

First, Petitioner argues *Markel* renders obvious “the second pad of the ‘first electrode’ is configured to detect a second electrical signal of a cardiac signal via the user’s skin’s contact with the second pad” because “*Markel* discloses that electrodes ‘***detect cardiac activity of a user*** that is ***conductively coupled to the electrodes (e.g., by touching the electrodes)***[,] . . . that ‘electrodes contact a user during normal (or typical) use of the [electronic device]’ and “*Markel*’s electrodes ‘may comprise a metallic surface exposed for ***user contact***.” Pet. 26–27 (citing Ex. 1003 ¶¶ 151–156; Ex. 1005 ¶¶ 35, 37, 41).

Second, in the alternative, Petitioner argues *Markel* renders obvious “the second pad of the ‘first electrode’ is configured to detect a second electrical signal of a cardiac signal via the user’s skin’s contact with the second portion of the enclosure” because the electrode can be conductively coupled to the user without requiring direct contact. Pet. 27 (citing Ex. 1003 ¶¶ 152–155; Ex. 1005 ¶ 35).

According to Petitioner, “[a] POSITA would have understood that *Markel*’s ‘first electrode’ in Figure 4 comprises a second pad that is embedded in the ‘left side portion 410.’” Pet. 27 (citing Ex. 1003 ¶ 156). Petitioner further argues that “a POSITA would have placed the pad of the ‘first electrode’ in *Markel*’s Figure 4 underneath the conductive plastic of the ‘left side portion 410.’” *Id.* Petitioner argues that the “second pad would have been configured to detect a second electrical signal of a cardiac

signal via the user's skin's contact with the exterior surface of the electronic device's 'left side portion' (i.e., the second portion of the enclosure)." *Id.*

[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."

Petitioner argues that Markel renders obvious this limitation. Pet. 28 (citing Ex. 1003 ¶¶ 158–162; Ex. 1005, Fig. 10). First, Petitioner argues Markel renders obvious "a processor coupled to the heart sensor and configured to receive and process the detected cardiac signal" because "*Markel* teaches a 'cardiac information processing module 1050' . . . that '***processes acquired cardiac information***' from the 'cardiac information acquisition module 1010.'" *Id.* at 28–29 (citing Ex. 1003 ¶ 159; Ex. 1005 ¶¶ 58–59, 178, Fig. 10). Petitioner argues that Markel's "first electrode and second electrode are connected to the 'cardiac information processing module 1050' through the 'cardiac information acquisition module 1010' and a 'memory 1040.'" *Id.* at 29 (citing Ex. 1003 ¶ 161; Ex. 1005 ¶¶ 58–59).

Second, Petitioner argues Markel renders obvious "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" because Markel's disclosure of a "second electrode" coupled to a cardiac acquisition module corresponds to the "first lead comprising a first pad." Pet. 29 (citing Ex. 1003 ¶ 160). Petitioner argues Markel renders obvious

“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” because Markel’s disclosure of a “first electrode” coupled to a cardiac acquisition module corresponds to the “second lead comprising a second pad.” *Id.*

Summary

Although we have not specifically addressed several uncontested limitations set forth above, we will do so based upon the final record, and in light of the deficiencies noted for claim limitation [1.c.iii] examined above. For the foregoing reasons, we question whether Petitioner’s cited evidence demonstrates a reasonable likelihood that Petitioner would prevail in its contention that claim 1 would have been obviousness over Markel.

3. Independent Claim 15.

Petitioner presents contentions that claim 15 would have been obvious over the teachings of Markel. Pet. 52–63. Patent Owner’s contentions with respect to claim 1 and the narrower AliveCor interpretation would seemingly not be applicable to claim 15. Prelim. Resp. 37–45. For example, Patent Owner’s primary contention is that “nowhere does Markel disclose or suggest that its method of concealment involves placing an electrode pad ***underneath*** an enclosure of a device.” *Id.* at 42. Claim 15, however, does not require an electrode pad underneath an enclosure of a device as does claim 1. *See* Ex. 1001, 14:1–20. Patent Owner also contends that in both of its mappings, AliveCor improperly addresses two distinct features of claim 1 with the same component in Markel. Prelim. Resp. 47. This argument would not apply to claim 15 because the claim does not have a requirement for “an exterior surface of the first portion” (Patent Owner’s alleged second distinct feature). *See id.*

Petitioner has offered persuasive evidence showing how Markel teaches the unique limitations of claim 15. Pet. 52–63. For example, claim 15 uniquely requires, “a display screen exposed to the user through an opening in the enclosure,” and Petitioner relies on Figure 1 of Markel, which depicts such a display screen. Pet. 52–53 (“*Markel* discloses a ‘main body portion 110,’ which corresponds to the claimed ‘enclosure’ (*see* [15.a]; Ex. 1003, ¶272). *Markel* further discloses that the electronic device ‘may also comprise . . . a display 140 (which may also function as a touch screen input feature).’”). *See also* Pet. 58–60 (examining a second lead embedded in the display screen and how a person of ordinary skill in the art would have known that an electrode pad that is “integrated into a touch screen” is embedded in “display 140”), 62–63 (discussing detecting a second electrical signal of the user’s cardiac signal via the user’s contact with a second lead and display screen and Markel’s ability to detect cardiac activity by touching electrodes during normal (or typical) use). Based on the above, Petitioner’s evidence and argument presents a reasonable likelihood that claim 15 would have been obvious over Markel.

Moreover, as we preliminarily conclude below that Petitioner demonstrates a reasonable likelihood of prevailing with respect to its obviousness challenge to independent claim 1 as rendered obvious based on ground 2, we institute review on all challenged claims on all grounds set forth in the Petition, including Petitioner’s challenge to claim 15 as rendered obvious by Markel. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354 (2018); *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

4. Dependent Claims 2–14 and 16–22.

Petitioner also contends that claims 2–14 and 16–22 would have been obvious over Markel. Pet. 29–51, 63–69.

Because claims 2–14 and 16–22 depend directly, or indirectly, from claims 1 and 15, the same issues examined above are also applicable to these claims. As we preliminarily conclude below that Petitioner demonstrates a reasonable likelihood of prevailing with respect to its obviousness challenge based on ground 2 (Markel and Nissilä), we institute review on all challenged claims on all grounds set forth in the Petition, including Petitioner’s challenge that claims 2–14 and 16–22 would have been rendered obvious by Markel. *See SAS*, 138 S. Ct. at 1354; *PGS Geophysical*, 891 F.3d at 1360.

E. Obviousness of Claims 1–22 Over Markel and Nissilä

Petitioner alleges that claims 1–22 would have been obvious over Markel and Nissilä. Pet. 69–84. Specifically, Petitioner uses ground 2 to expand on ground 1: “Ground 1 is incorporated herein. For brevity, only the limitations that are further rendered obvious by Nissilä are addressed.” Pet. 69. Patent Owner opposes. Prelim. Resp. 48–55. For reasons discussed below, we determine that Petitioner has shown a reasonable likelihood that it would prevail in its obviousness challenge based on Markel and Nissilä.

1. 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.

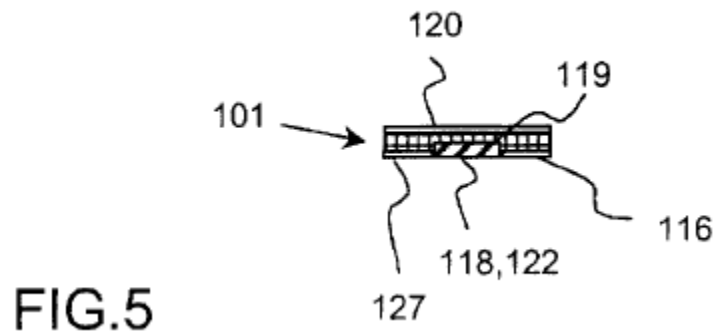


Figure 5 illustrates a band-like component 101 of an electrode structure for measuring an ECG signal on the skin of a person's chest. Ex. 1006, code (57), 5:3–5, 5:16–17.

Band-like component 101 illustrated in Figure 5 is preferably a continuous band 101 having an inner surface 116 against the skin of the person's chest and an outer surface 120. Ex. 1006, 5:4–6. Electrodes 118, 122 of the electrode structure 100 consist of membrane 119 that is located at both ends of electrode structure 100, at electrodes 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 the 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 an electrically conductive

adhesive 127 on inner surface 116 of membrane 119, which is against the person's skin. *Id.* at 5:41–43.

2. Independent Claim 1.

Petitioner presents contentions that claim 1 would have been obvious over the combined teachings of Markel and Nissilä. Pet. 71–77. Patent Owner opposes. Prelim. Resp. 48–55. Specifically, Patent Owner questions the compatibility of Markel and Nissilä – alleging they do not share similar goals – and further argues that a person of ordinary skill in the art would not have had a reasonable basis to combine the references. *Id.* at 51–55.

Petitioner argues Markel and Nissilä are directed to the same technical field of personal heart sensors and disclose similarly structured electrodes for their similar goals of having concealed or inconspicuous electrodes. Pet. 69–70 (citing Ex. 1003 ¶¶ 352–353; Ex. 1005 ¶ 40; Ex. 1006, 1:7–10, 2:17–20, 5:32–37). Petitioner argues that a POSITA would be motivated to combine Markel and Nissilä to accomplish Markel's goal of a concealed electrode that is aesthetic, protected from damage, and is able to provide ECG capability. *Id.* at 70–71 (citing Ex. 1003 ¶¶ 354–355; Ex. 1005 ¶ 40). Petitioner argues that a POSITA would have a reasonable expectation of success in combining Markel and Nissilä because both disclose conductive material made out of conductive plastic. *Id.* at 71 (citing Ex. 1003 ¶ 354; Ex. 1005 ¶ 37; Ex. 1006, 5:32–37).

Patent Owner disagrees with Petitioner's reasons for combining Markel and Nissilä as set forth below.

[1.c.i] “the heart sensor comprising: 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 cardiac signal via the user’s skin’s contact with the exterior surface of the first portion of the enclosure;”

Petitioner argues Markel in view of Nissilä discloses these limitations under the alleged “correct interpretation” wherein the pad is underneath the exterior surface. Pet. 71 (citing Ex. 1003 ¶¶ 356–362). Petitioner argues that a person of ordinary skill in the art would have turned to Nissilä’s disclosure of an “improved electrode structure” having a pad that is positioned underneath the exterior surface to implement Markel’s “hidden” electrode structure. *Id.* at 71 (quoting Ex. 1006, 2:17–20, Fig. 5; Ex. 1003 ¶ 357). Petitioner argues that Nissilä discloses an electrode surrounded by a membrane made out of conductive plastic that comes in contact with a person’s skin surface as depicted below in Petitioner’s annotated Figure 5. *Id.* at 71–72 (citing Ex. 1003 ¶¶ 358–359; Ex. 1006, 2:17–20, 5:6–9, 5:39–43, Fig. 5).

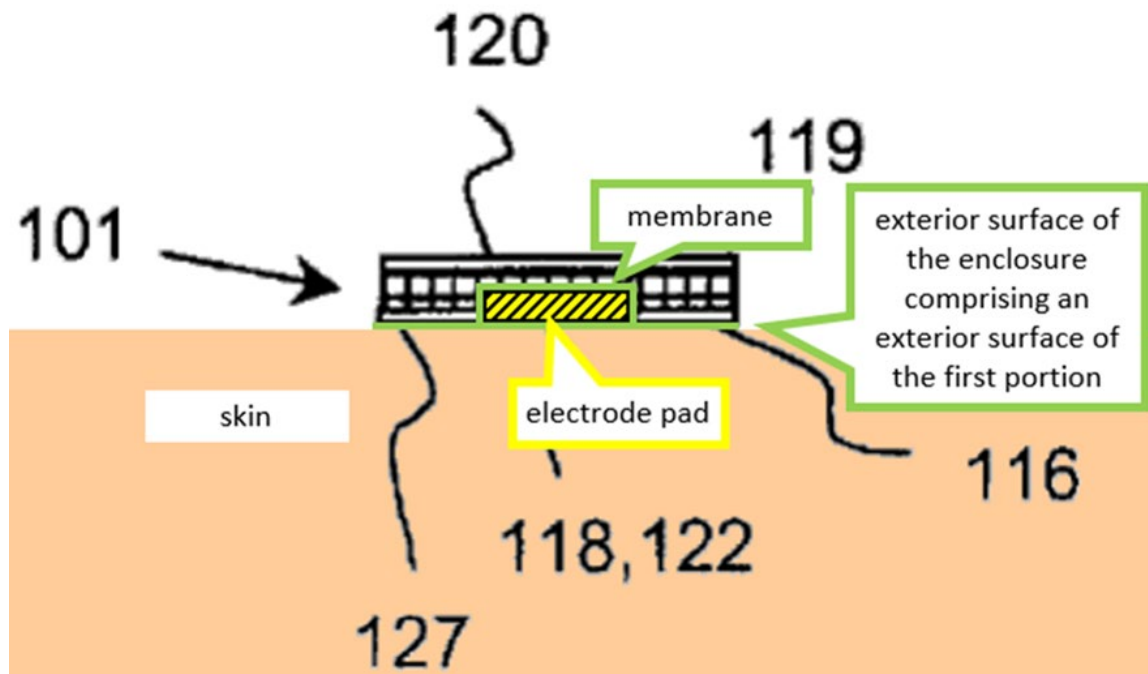


Figure 5 depicts a cross section of Nissilä’s electrode structure with Petitioner’s annotations of: “skin,” “electrode pad,” “membrane,” and “exterior surface of the enclosure comprising an exterior surface of the first portion.” Pet. 73.

According to Petitioner, “[a] POSITA would thus have been motivated to implement *Nissilä*’s electrode structure in at least *Markel*’s “audio output portion 610” to accomplish “Markel’s stated goal of a ‘hidden’ electrode” to render obvious limitations [1.c.i], [1.c.ii], and [1.c.iii]. Pet. 73–74 (citing Ex. 1003 ¶¶ 360–361; Ex. 1005 ¶ 40).

Patent Owner opposes and argues Petitioner “fails to demonstrate why a POSITA would have integrated selected portions of Nissila into Markel . . . without relying on impermissible hindsight.” Prelim. Resp. 48 (citing Ex. 2001 ¶¶ 85–91). Patent Owner argues that the “context for using ‘concealment’ in Markel is not even remotely relevant to the context for using ‘inconspicuous’ in Nissila.” *Id.* at 49–50 (citing Ex. 2001 ¶¶ 86–87). More specifically, Patent Owner contends that whereas Markel’s electrodes are designed to be concealed from the user, Nissilä’s device is designed to

be inconspicuous to others while the user wears the device. *Id.* at 49–50 (citing Ex. 1005 ¶ 40; Ex. 1006, 2:62–67, 5:18–20; Ex. 2001 ¶ 87). Patent Owner contends that Nissilä discloses a “***band-like***” electrode structure that is comfortable and inconspicuous to wear while attached to the skin of the user’s chest. *Id.* at 50 (citing Ex. 1006, 2:16–32, 2:62–67, 4:64–65, 5:3–4, 5:6–9, Figs. 2–4; Ex. 2001 ¶¶ 57–60).

Patent Owner argues that Petitioner “and its expert erroneously allege that a POSITA would have been motivated to combine Markel and Nissila” because they share a common goal. Prelim. Resp. 51–52 (citing Ex. 1003 ¶ 353; Ex. 2001 ¶ 86). Patent Owner argues that Petitioner “is wrong. Markel and Nissila are not in pursuit of a common goal.” *Id.* at 52 (citing Ex. 2001 ¶ 86). Patent Owner argues that Markel’s goal is using electrodes made from a conductive plastic material to conceal the electrodes from the user. *Id.* at 52–53 (citing Ex. 1005 ¶ 40; Ex. 2001 ¶ 87). Patent Owner contends that in contrast, the goal of Nissilä’s device is for the user to be aware of the electrodes to place them on their chest. *Id.* at 53 (citing Ex. 1006, code (57), 2:61–3:5; Ex. 2001 ¶ 87). Patent Owner argues that the electrodes are only inconspicuous to wear so to not be visible to others. *Id.* at 53–54 (citing Ex. 1006, 1:58–2:8, 2:61–3:5; Ex. 2001 ¶ 88).

According to Patent Owner, Nissilä’s electrodes are visible and “a POSITA would have understood that visual concealment of the electrode is simply unnecessary for Nissila’s electrodes because these electrodes are physically placed underneath the user’s clothing.” *Id.* at 54 (citing Ex. 1006, Figs. 2, 4–9; Ex. 2001 ¶ 89). Additionally, Patent Owner argues that a POSITA would not be able to incorporate Nissilä’s flexible electrodes into Markel’s electrodes that are part of a protective housing. *Id.* at 54 (citing

Ex. 2001 ¶ 90). Patent Owner argues that a POSITA would not have been motivated to combine Markel's electrodes that are not designed for adherence or conformity to a user's body with Nissilä's electrodes that are designed to fit the skin closely. *Id.* at 54–55 (citing Ex. 2001 ¶ 90).

Petitioner's motivation for incorporating Nissilä's electrode into Markel – to accomplish Markel's goal of a concealed electrode – is a reasonably sufficient basis or reason to combine the references. On this record, Petitioner demonstrates that a person of ordinary skill in the art would have reason to apply Nissilä's electrode structure having a distinct exterior surface to the teachings of Markel because of the similarities in electrode structure and to achieve a stated goal of Markel. Nissilä's electrode structure uses an external layer of “metal, electrically conductive plastic or a similar conductive material.” Ex. 1006, 5:32–37; Ex. 1003 ¶ 355 (“both references disclose an intermediate conductive material made of conductive plastic”). Petitioner has shown this structure could be adopted by Markel's “hidden” electrode having a main body portion formed from conductive plastic and a person having ordinary skill in the art would be motivated to do so in order to achieve Markel's stated goal of an electrode that is substantially concealed (or hidden) from a user. *See* Ex. 1003 ¶ 354. Even if a goal of Nissilä's device is for the user to be aware of the electrodes to place them on their chest, as Patent Owner alleges, Petitioner shows that Markel's concealment objective could be suitably achieved by use of Nissilä's structure, even if Nissilä does not share a similar concealment objective. *Id.* ¶ 355 (“*Markel's* hidden electrode is desirable because it increases aesthetics of the device while protecting the electrode from bumps or other damage.”).

Based on the record before us, Petitioner has also shown sufficiently that a POSITA would be motivated to combine Markel and Nissilä to satisfy limitations [1.c.i], [1.c.ii], and [1.c.iii].

[1.d.i] “the heart sensor comprising: . . . 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;”

Petitioner argues that Markel and Nissilä render obvious these limitations. Pet. 74–77. According to Petitioner, “a POSTIA would have combined the teachings of *Markel* and *Nissilä* in order to accomplish construction of *Markel*’s ‘hidden’ electrode.” *Id.* at 74 (citing Ex. 1003 ¶ 363; Ex. 1005, Fig. 6). Petitioner argues Nissilä discloses an electrode embedded in and enclosed by a membrane, and that the electrode can detect a cardiac signal. *Id.* (citing Ex. 1003 ¶¶ 364–365; Ex. 1005, Fig. 6). According to Petitioner, “[a] POSITA would thus have implemented *Nissilä*’s electrode structure in at least *Markel*’s ‘main body portion 620’...[t]his construction would have accomplished *Markel*’s stated goal of a ‘hidden’ electrode.” *Id.* at 76 (citing Ex. 1003 ¶ 366; Ex. 1005 ¶ 40).

As addressed above, Petitioner’s motivation for incorporating Nissilä’s electrode into Markel’s body portion – to accomplish Markel’s goal of a hidden electrode – is a reasonably sufficient basis or reason to combine the references. Petitioner has also shown sufficiently that a POSITA would be motivated to combine Markel and Nissilä to satisfy limitations [1.d.i] and [1.d.ii]. Based on the record before us, Petitioner has

shown by a reasonable likelihood that Markel and Nissilä render obvious limitations [1.d.i] and [1.d.ii].

Summary

For the foregoing reasons, we are persuaded that Petitioner's cited evidence demonstrates a reasonable likelihood that Petitioner would prevail in its obviousness contentions regarding claim 1.

3. Independent Claim 15.

Petitioner presents contentions that claim 15 would have been obvious over the combined teachings of Markel and Nissilä. Pet. 81–84. Petitioner also cites to and relies on its contentions with respect to claim 15 as obvious over Markel alone. *See id.* at 51–63. Patent Owner opposes based on arguments in support of claim 1, but does not offer any arguments unique to claim 15 on this record. Prelim. Resp. 37–48; Prelim. Reply 7 (“Apple’s POPR does not even attempt to substantively address AliveCor’s mapping of Markel to claim 15.”).

Petitioner relies on similar evidence and argument addressed above to support its position that claim 15 would have been obvious in view of Markel and Nissilä. Pet. 81–84. Petitioner addresses unique claim 15 limitations, including Markel’s description of a display screen in an opening in the enclosure. *Id.* at 52–53. We have considered the parties’ contentions and evidence and find that Petitioner has shown a reasonable likelihood that claim 15 would have been obvious over Markel and Nissilä.

4. Dependent Claims 2–14 and 16–22.

Petitioner presents undisputed contentions that claims 2–14 and 16–22 would have been obvious over the combined teachings of Markel and Nissilä and provides arguments explaining how the references teach the limitations of these claims. Pet. 69, 77–81, 84. Petitioner additionally relies on its

analysis of ground 1 (obviousness based on Markel alone) for several of these claims. *Id.* at 69 (“Ground 1 is incorporated herein. For brevity, only the limitations that are further rendered obvious by *Nissilä* are addressed below.”).

Patent Owner does not offer, at this stage, any arguments addressing Petitioner’s substantive showing. We have reviewed these arguments and the cited evidence, and we determine Petitioner has demonstrated a reasonable likelihood of prevailing as to these contentions.

Moreover, as we preliminarily conclude that Petitioner demonstrates a reasonable likelihood of prevailing with respect to its obviousness challenge to independent claims 1 and 15, we institute review on all challenged claims on all grounds set forth in the Petition, including Petitioner’s challenge to claims 2–14 and 16–22 as rendered obvious by Markel and *Nissilä*. *See SAS*, 138 S. Ct. at 1354; *PGS Geophysical*, 891 F.3d at 1360.

F. Obviousness of Claims 12, 13, and 19 Over Markel in view of Nissilä and/or Righter

Petitioner alleges that claims 12, 13, and 19 would have been obvious over Markel in view of *Nissilä* and/or *Righter*. Pet. 84–91. Patent Owner opposes based upon similar reasoning for claim 1. Prelim. Resp. 55–59.

As discussed in detail above, Petitioner has demonstrated by a preponderance of the evidence that claims 1 and 15 would have been obvious over Markel and *Nissilä*. At this phase of the proceeding, we decline to separately address this ground directed to claims 12, 13, and 19. We institute review of all of this remaining challenge. *See SAS*, 138 S. Ct. at 1348; Consolidated Practice Guide, 5–6, 64.

III. ANALYSIS OF DISCRETIONARY CONSIDERATIONS

The Board has discretion to decline institution of an *inter partes* review even if Petitioner demonstrates a reasonable likelihood of success. *See* 35 U.S.C. §§ 314(a), 325(d); *see also* 37 C.F.R. §§ 42.4(a) (the Board institutes trial on behalf of the Director), 42.108(a) (stating “the Board *may* authorize the review to proceed” (emphasis added)); *Harmonic Inc. v. Avid Tech, Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (explaining that “the PTO is permitted, but never compelled, to institute an IPR proceeding”).

Patent Owner contends that we should exercise our discretion to deny institution. Prelim. Resp. 8–32; Prelim. Sur-Reply. Petitioner disagrees that discretionary denial is appropriate. Pet. 91–93; Prelim. Reply 1, 6.

At the outset, we note that Apple asserted the ’257 patent against AliveCor in the co-pending litigation on December 2, 2022, and AliveCor filed this petition (its first) challenging the claims of the ’257 patent on June 7, 2023. *See* Related Proceedings above (*Apple Inc. v. AliveCor, Inc.*, Case No. 4:22-cv-07608-HSG (N.D. Cal.) (“the co-pending Litigation”). Pet. 95; Paper 3 ¶ 2). Having considered the parties’ arguments and the evidence of record, we are not persuaded to discretionarily deny institution. We explain our reasoning below.

A. 35 U.S.C. § 314(a)—*Fintiv*

Petitioner contends that we should not exercise our discretion to deny institution given the status of the co-pending Litigation. Prelim. Resp. 91–93. Patent Owner did not specifically argue that we should deny institution under *Fintiv*. *See* Prelim. Resp. 8–32; Prelim. Sur-Reply. Given the circumstances present there, we conclude that exercise of our discretion to deny institution based on *Fintiv* is not warranted.

On October 23, 2023, Petitioner filed a Motion to Stay in the co-pending Litigation. The district court issued an order granting the Motion to Stay on December 29, 2023. *See* Ex. 3001 (docket entry 89, Dec. 29, 2023). Petitioner has stipulated that they will withdraw any identical grounds from the co-pending Litigation if the Petition is instituted. *See* Pet 93; *see also Sand Revolution II, LLC v. Continental Intermodal Grp - Trucking LLC*, IPR2019-01393, Paper 24 at 12 n.5 (PTAB June 16, 2020). In view of the circumstances, we decline to exercise discretion to deny institution.

B. 35 U.S.C. § 314(a)—General Plastic

Patent Owner contends that we should deny institution because the Petition is similar to and filed after the 745 IPR filed by Masimo Corporation on March 22, 2023. Prelim. Resp. 1; *see also* Prelim. Sur-Reply 1. Patent Owner notes that the 745 IPR was filed in March 2023, which is 3 months before the June 2023 filing of the Petition. *Id.* Patent Owner recognizes that the 745 IPR was filed by a different party, Masimo Corporation (“Masimo”). *Id.* Patent Owner further notes that the Petition is similar to the 745 IPR because it relies on the same Markel reference and similar arguments to challenge most of the same claims. *Id.* at 1–2. Patent Owner further contends that Petitioner will be able to unfairly gather insights from the earlier filed 745 IPR to use as a roadmap for refining arguments in the Petition. *Id.* at 2–4. From this, Patent Owner argues that the Board should apply the *General Plastic* factors, and that those factors favor discretionarily denying institution. Prelim. Resp. 8–19; *see also* Prelim. Sur-Reply 5–8.

The *General Plastic* factors are non-exhaustive factors considered by the Board when serial petitions have been filed challenging the same patent.

General Plastic Indus. Co. v. Canon Kabushiki Kaisha, IPR2016-01357, Paper 19 at 15–16 (PTAB Sept. 6, 2017) (precedential) (“*General Plastic*”).

These factors are:

1. whether the same petitioner previously filed a petition directed to the same claims of the same patent;
2. whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it;
3. whether at the time of filing of the second petition the petitioner already received the patent owner’s preliminary response to the first petition or received the Board’s decision on whether to institute review in the first petition;
4. the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition;
5. whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent;
6. the finite resources of the Board; and
7. the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review.

Id. at 16. In addition, “when different petitioners challenge the same patent, we consider any relationship between those petitioners when weighing the *General Plastic* factors.” *Valve Corp. v. Elec. Scripting Prods., Inc.*, IPR2019-00062, Paper 11 at 9 (PTAB Apr. 2, 2019) (precedential). In particular, the Board has determined that, even though a prior petition was filed by a different entity, the first *General Plastic* factor weighs against institution when “there is a significant relationship between [the instant petitioner] and [the prior petitioner] with respect to Patent Owner’s assertion of the [challenged] patent.” *Id.* at 10.

Having reviewed the parties' arguments and the evidence in the record, we determine that the first *General Plastic* factor does not favor discretionarily denying institution. The 745 IPR was filed by Masimo, and this is Petitioner's first petition challenging the '257 patent. Petitioner represents that there is no relationship between Petitioner and Masimo, as these entities were separately sued by Patent Owner. Prelim. Reply 1–2; *see also* Ex. 1016; Ex. 2003. Specifically, Petitioner argues that the Petition was filed after Masimo filed the 745 IPR because Petitioner was sued after Masimo. *Id.* at 2–4. On this record, we agree.

As for the remaining factors, we determine that these factors in the aggregate also do not favor discretionarily denying institution. We agree with Petitioner that because the Petition was filed before Patent Owner's preliminary response or the Board's institution decision in the 745 IPR, Petitioner could not use the 745 IPR as a roadmap.

For these reasons, we decline to exercise our discretion to deny the Petition.

C. 35 U.S.C. § 325(d)—Advanced Bionics

Patent Owner also contends that we should deny institution because Markel was asserted in the 745 IPR and Petitioner has not shown that the Board materially erred in its consideration of this reference. Prelim. Resp. 19–32; *see also* Prelim. Sur-Reply 1–5. Petitioner disagrees that discretionary denial is appropriate. Prelim. Reply 6–8.

The Board uses a two-part framework in determining whether to exercise its discretion under § 325(d): (1) determining whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to

the Office; and (2) if either condition of the first part of the framework is satisfied, determining whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *See Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). In applying this framework, we consider several non-exclusive factors, including:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to Section III.C.5, first paragraph). Factors (a), (b), and (d) relate to the first part of the *Advanced Bionics* framework (i.e., whether the art or arguments presented in the Petition are the same or substantially the same as those previously presented to the Office), and factors (c), (e), and (f) relate to the second part (i.e., “whether the petitioner has demonstrated a material error by the Office” in its prior consideration of the prior art or arguments). *Advanced*

Bionics, Paper 6 at 10. “[T]his framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Id.* at 9.

We first consider whether “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office.” *Advanced Bionics*, Paper 6 at 8. Patent Owner argues that Markel is the same reference previously presented to the Office in the 745 IPR. Prelim. Resp. 21–28; *see also* Prelim. Sur-Reply 2. Petitioner argues that Markel has not been previously presented since the Board had not yet considered the 745 IPR when the Petition was filed, and the Board has since only considered Markel for instituting the 745 IPR. Prelim. Reply 6. Petitioner argues the Board’s decision to institute is not a sufficient demonstration that the Markel reference was previously presented to the Office. *Id.*

Additionally, the Petition asserts grounds that rely on Markel with Nissilä and/or Righter, and it does not appear that either of these prior art references are the same as art previously presented to the Office. Prelim. Resp. 25–28; *see also* Prelim. Sur-Reply 2–3; Prelim. Reply 7. However, Patent Owner argues that Nissilä and Righter are substantially the same as Markel because Petitioner uses Nissilä and Righter solely for alleged disclosure of limitations that Petitioner already contends are obvious over Markel. Prelim. Resp. 26–27. Additionally, Patent Owner argues that Nissilä and Righter are similar to Mills, which was prior art relied on by Masimo in the 745 IPR. Prelim. Sur-Reply 2–3. Petitioner argues that Nissilä and Righter are newly cited prior art that are not cumulative of Markel. Prelim. Reply 7.

Patent Owner also argues that the arguments in the 745 IPR are the same or substantially the same as arguments in the Petition. Prelim. Resp. 21–23. Petitioner contends that the arguments presented in the Petition regarding Markel are materially different from those presented in the 745 IPR. Prelim. Reply 7–8; Prelim. Sur-Reply 1–2. Specifically, in the 745 IPR, the petitioner argued that Markel and Mills render obvious the claims of the '257 patent, whereas the Petition instead contends that it would have been obvious to rely on different embodiments of Markel alone; Markel and Nissilä; and Markel, Nissilä, and Righter to yield the claimed subject matter. *Id.*; *see also* Pet. 1.

We determine that the first part of the *Advanced Bionics* framework is not satisfied. Since the 745 IPR has only been instituted and the Board has not yet reached a final decision, the prior art references and arguments could not yet have been considered “previously . . . presented to the Office.” *See* 35 U.S.C. § 325(d) (“[T]he Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments *previously were presented* to the Office.”) (emphasis added). The 745 IPR is now a concurrent proceeding where a different petitioner is actively presenting the same Markel reference during a trial – the preliminary determinations in that proceeding are not dispositive or appealable until a final decision and judgment are reached. *See* 37 C.F.R. § 42.71(c), § 42.73 (discussing impacts of judgment). As the Board stated in the 745 IPR, “[a]t this stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim.” IPR2023-00745, Paper 8 at 44. In other words, and even if the prior art and arguments in the 745 IPR are the same or substantially the same as those in the Petition,

the art and arguments still are in the process of being presented to and considered by the Office and we do not treat them as “previously . . . presented to the Office” pursuant to § 325(d).

Moreover, in the 745 IPR, Masimo argued that Markel and Mills render obvious the claims of the '257 patent. Here, Petitioner does not follow Masimo's lead. Petitioner instead argues obviousness of the challenged claims in view of Markel; Markel and Nissilä; and Markel, Nissilä, and Righter. *See* Pet. 1. We have considered the extent to which Markel was previously presented in view of Petitioner's additional arguments and evidence, pursuant to *Becton, Dickinson* factors (a), (b), and (d), and we are persuaded that considering the merits of Petitioner's arguments regarding Markel is appropriate under the circumstances presented here. Accordingly, we determine that the first part of the *Advanced Bionics* framework is not satisfied as to the Petition as a whole.

Having concluded that the first part of the *Advanced Bionics* framework is not satisfied because the prior art and arguments asserted in the Petition are not the same or substantially the same as those previously presented to the Office, we need not reach part two of the *Advanced Bionics* framework. *See Advanced Bionics*, at 8 (stating part two is reached only “if either condition of [the] first part of the framework is satisfied”).

Regardless of whether the first part of the *Advanced Bionics* framework is satisfied, as for the second part of the *Advanced Bionics* framework, Patent Owner argues that Petitioner has not shown that the Office erred. Prelim. Resp. 29. Petitioner notes that because the Board has not issued a final decision in the 745 IPR, Petitioner has no way to show error. Prelim. Reply 8.

On the particular facts presented here, we are persuaded by Petitioner's arguments because Petitioner does not need to show the Board erred in considering the 745 IPR before the Board issues a final written decision. The framework provided by *Advanced Bionics* and *Becton, Dickinson* factors (c), (e), and (f) "reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown." *Advanced Bionics*, Paper 6 at 9.

Because this framework is an inquiry into whether the Office previously erred in a manner material to the patentability of challenged claims, in the unique situation arising from this Petition, there is no applicable evaluation by the Office to which we could defer, as the Board has not yet had the opportunity to issue a final decision in the 745 IPR. Even though the Board has issued a decision to institute the 745 IPR, such institution is based on an incomplete record and it is therefore not possible to determine whether the Office erred in a manner material to patentability. As the Board stated in the 745 IPR, "[a]t this stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim." IPR2023-00745, Paper 8 at 44. Therefore, we do not find that Petitioner was required to explain why the Board erred in its institution decision in the 745 IPR.

Further, we note that the grounds for which Petitioner relies on Markel with Nissila and/or Righter, together address all twenty-two claims at issue in the Petition (*see* Pet. 1), and as explained above, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing as to these claims. Accordingly, we determine that the second part of the *Advanced Bionics* framework is also not satisfied.

For these reasons, we decline to exercise our discretion to deny institution.

IV. CONCLUSION

The Supreme Court held that a final written decision under 35 U.S.C. § 318(a) must decide the patentability of all claims challenged in the petition. *SAS*, 138 S. Ct. at 1348. After considering the evidence and arguments presented in the Petition, we determine that Petitioner has a reasonable likelihood of success in proving that at least one claim of the '257 patent is unpatentable. Accordingly, we institute an *inter partes* review of all claims and all grounds set forth in the Petition. *See* 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

At this stage of the proceeding, we have not made a final determination as to the patentability of any challenged claim or as to the construction of any claim term.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–22 of the '257 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '257 patent shall commence

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on the entry date of this Order, and notice is hereby given of the institution
of a trial.

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