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UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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MASIMO CORPORATION  
Petitioner,

v.

APPLE INC.  
Patent Owner.

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Case No. IPR2023-00745  
U.S. Patent No. 10,076,257

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**PETITIONER'S OPPOSITION TO  
PATENT OWNER'S CONTINGENT MOTION TO AMEND**

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## **I. INTRODUCTION**

Apple's proposed substitute Claims 22–28 seek to wholesale replace, not amend, the claims with entirely different claims. These amendments enlarge the scope of the claims and are unresponsive to the Petition's grounds. The substitute claims deviate so significantly from the '257 patent's claims and disclosure that they also lack written description support. Further, the substitute claims would have been obvious in view of the prior art asserted in the Petition. Apple's substitute Claim 22 is particularly troubling because the '257 patent already recites a Claim 22. Therefore, it is unclear whether Claims 23 and 24 depend from original Claim 22 or substitute Claim 22. Thus, the Board should deny Apple's motion to amend.

## **II. PROPOSED SUBSTITUTE CLAIMS 22-28 HAVE AN ENLARGED SCOPE AND ARE NOT RESPONSIVE TO THE PETITION GROUNDS**

### **A. Deleting claim limitations impermissibly enlarges claim scope**

Under 35 U.S.C. § 316(d)(3), an amendment “may not enlarge the scope of the claims.” The Board has consistently held that amendments that delete limitations are broadening. In *Samsung Electronics Co., Ltd. et al v. NuCurrent, Inc.*, the Board denied a motion to amend because the substitute claims added certain limitations and deleted substantially all original limitations of corresponding original claims. *See* IPR2019-00859, Paper 88 at 48–49 (PTAB, Feb. 23, 2021). The Board explained such deletions “enlarge the scope of the claims they replace, notwithstanding any added limitations.” *Id. See also Samsung Elecs. Co., Ltd. v.*

*NuCurrent, Inc.*, IPR2019-00861, Paper 81 at 54–55 (PTAB, Feb. 23, 2021); *Unified Patents, LLC v. Fat Statz, LLC*, IPR2020-01665, Paper 51 at 39-40 (PTAB, Apr. 4, 2022) (denying motion to amend that added narrowing limitations but enlarged claims by omitting a limitation); *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 7-8 (PTAB, Feb. 25, 2019).

These Board decisions are consistent with Federal Circuit case law. For example, in *Sisvel Int'l S.A. v. Sierra Wireless, Inc.*, the Federal Circuit held that a “claim that does not include a limitation present in the original patent claims is broader in that respect.” 81 F.4th 1231, 1240 (Fed. Cir. 2023). An amendment that is broadening in *any respect* is impermissible. *Id.* at 1241.

**B. Apple’s amendments broaden the claims**

Apple has broadened the claims by changing the dependencies of all the substitute claims from independent claim 15 to Claim 1. In addition, Apple deleted all the original claim limitations in each of the original dependent claims. As a result, every substitute claim is broader in some respect than the original claim.

The original claims depended from independent Claim 15. Claim 15 recites “a second lead embedded in the display screen of the electronic device.” Apple changed the dependency from Claim 15 to Claim 1 thereby jettisoning the “second lead embedded in the display screen” limitation. Claim 1 instead recites “a second lead comprising a second pad that is embedded in a second portion of the enclosure.”

Apple broadened the claim likely because there is no dispute that Masimo's accused product does not have any lead embedded in the display. Apple's attempt to cover products not originally covered by the original claims is not the purpose of amendments in IPRs. In addition, Claim 15 recites a "display screen exposed to the user through an opening in the enclosure," but the substitute claims do not. EX1001, 14:1-2.

Apple never even addresses the difference between Claims 1 and 15, much less how the substitute claims are narrower. *See Sisvel Intern. SA v. Sierra Wireless, Inc.*, 81 F.4<sup>th</sup> 1231, 1238 (Fed. Cir. 2023) (quoting 37 C.F.R. § 42.121(d)(1) "A patent owner bears the burden of persuasion to show, by a preponderance of the evidence, that the motion to amend complies with the [applicable] requirements"). Instead, Apple argues that claim amendments may include "additional limitations to address potential § 101 or § 112 issues." MTA at 9 (relying on *Veeam Software Corp. v. Veritas Techs., LLC*, IPR2014-00090, Paper 48 at 28 (Jul. 17, 2017)). But Apple has not identified any amendments addressing § 101 or § 112 deficiencies, let alone argue how any amendments address such deficiencies.

Apple's broadening goes beyond changing the dependency of the substitute claims. Apple also deletes the original claim limitations of each dependent claim it seeks to amend. For example, substitute Claim 22 deletes the Claim 16 limitation of "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 lead.” While Claim 1 has a similar limitation, it refers to a “pad,” not to a “lead.” This distinction applies to the other substitute claims except Claim 25. Thus, Apple’s amendments broaden the claims because they delete limitations. *See* 37 CFR § 42.121(a)(2)(i).

Apple has argued against the same type of substitute claim amendments it now proposes. *See Apple Inc. et al v. Valencell, Inc.*, IPR2017-00317, Paper 28 at 2 (PTAB, Dec. 5, 2017). Specifically, in that IPR, Apple argued that deleting an original claim limitation “improperly enlarge[s] claim scope by removing the limitation.” *Id.* (citing *Idle Free Sys. Inc. v. Bergstrom, Inc.*, IPR2012-00027, Paper 26 at 5 (PTAB, June 11, 2013) (“[a] patent owner may not seek to broaden a challenged claim *in any respect.*”)) (emphasis in original). In that IPR’s Final Written Decision, the Board held that such deletions impermissibly broadened the claims” and “*a proposed substitute claim is not responsive to an alleged ground of unpatentability of a challenged claim if it does not include or narrow each feature of the challenged claim being replaced.*” *Id.*, Paper 46 at 55 (PTAB, June 1, 2018) (citation omitted).<sup>1</sup>

Apple broadens the claims even more than those in *Apple v. Valencell*. Valencell narrowed the independent claim by adding additional limitations and only

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<sup>1</sup> All emphasis added unless otherwise noted.

deleting a portion of the claim. *See Id.*, Paper 20 at 8–13. Here, Apple has not narrowed the claims but instead has wholesale replaced Claims 16-22 with entirely new limitations that enlarge the claim scope.

Apple’s amendments are a “complete remodeling of its claim structure according to a different strategy.” *Idle Free*, IPR2012-00027, Paper 26 at 6. The Board has held such complete remodeling is inappropriate. *Id.* Rather, Apple may seek such a strategy “in another type of proceeding before the Office.” *Id.* Thus, the Board should deny Apple’s motion because its amendments impermissibly broaden the claims and are not responsive to the invalidity grounds at issue.

### **III. PROPOSED SUBSTITUTE CLAIMS 22-28 LACK WRITTEN DESCRIPTION SUPPORT UNDER 35 U.S.C. § 112(A)**

Apple’s substitute claims lack written description support. In particular, “the motion must set forth written description support for each proposed substitute claim *as a whole*, and not just the features added by the amendment.” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 7-8 (PTAB Feb. 25, 2019). Apple has not demonstrated sufficient written description support for the claims as a whole. Rather, Apple points to paragraphs from the specification with broad teachings and attempts to combine disparate features or fabricate features not found in the specification.

EX1051, ¶147.<sup>2</sup>

Apple’s alleged support is based upon the combination of several features. However, these features are not linked in any meaningful way. In such a case, “a description which renders obvious a claimed invention is not sufficient to satisfy the written description requirement.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1356 (Fed. Cir. 2010). *See NeuroDerm Ltd. V. AbbVie Inc.*, PGR2022-00040, Paper 77 at 31 (PTAB, Oct. 31, 2023) (“A patent owner cannot show written description support by picking and choosing claim elements from different embodiments that are never linked together in the specification.”) (citing *Flash-Control, LLC v. Intel Corp.*, No. 2020-2141, 2021 WL 2944592, at \*4 (Fed. Cir. July 14, 2021)). For example, “[t]he written description requirement is not met when, as here, the specification provides at best disparate disclosures that an artisan might have been able to combine in order to make the claimed invention.” *Flash-Control*, at \*4 (2021). This same problem exists for each substitute claim. EX1051, ¶148.

With respect to proposed Claim 22, the specification does not support a “first pad is embedded in an inner surface” of a bezel. The specification does not use the words “embedded in an inner surface.” Apple points to [0034] of EX2001 and [0033]

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<sup>2</sup> In general, a single citation to Alan Oslan’s expert report is provided at the end of each paragraph that is supported by his testimony.

of EX2002, but this paragraph merely states that “each lead can include a pad or extended area *placed on* the outer or inner surface of an electronic device bezel or housing.” According to Apple placed on does not provide support for “embedded in.” Indeed, Apple argued that “‘embedded in’ requires more than two materials or substrates that are merely positioned adjacent to, parallel, or against each other.” POR at 9-10. *See also* EX1001 at 50-51 (arguing that prior art electrodes are not “embedded in” a first portion or second portion because the electrodes are “mounted on” a swing arm). *See* EX1058, 2:9-12. Thus, according to Apple, “embedded in an inner surface” cannot equate to “placed on an inner surface.” The specification fails to support “embedded in an inner surface.”

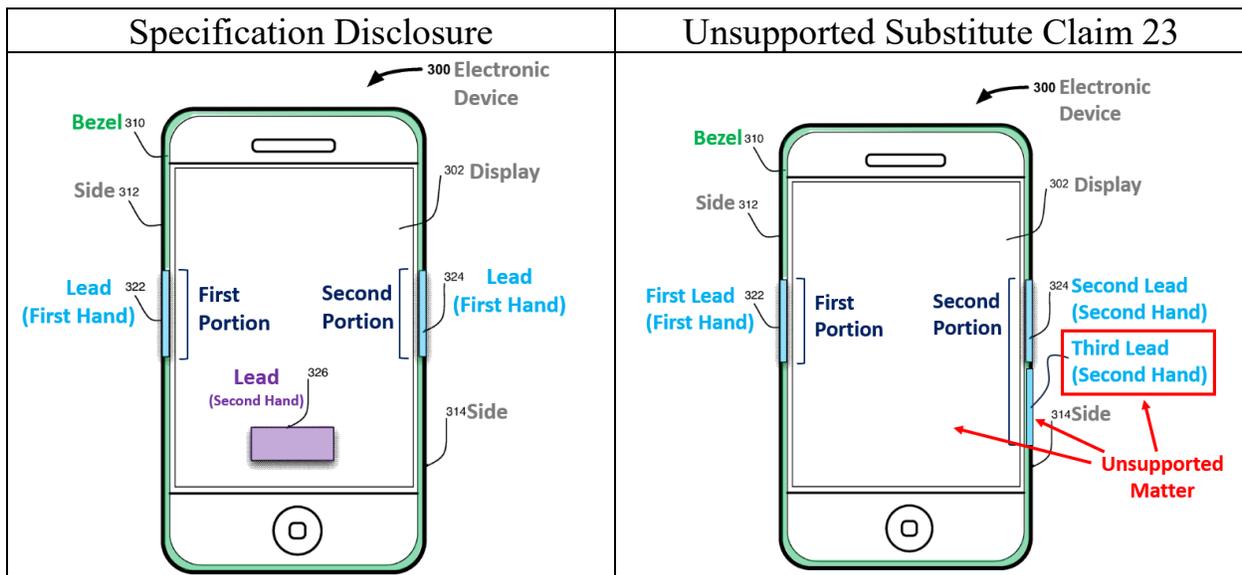
Likewise, features such as a bezel (EX2001, FIG. 3, bezel 310), and a “first pad” (*Id.*, [0034]) embedded (*Id.*, [0044]) in the inner surface of that bezel surrounding the touch screen are not supported as a whole. These features are at best disparate elements combined from various figures and paragraphs. EX1051, ¶149.

Regarding Claim 23, Apple replaces the previous claim with new subject matter—a “third pad that is embedded in the second portion of the enclosure”—that was never disclosed. Apple relies on Figures 3, 4B, and 5. Figure 4B shows one lead and Figure 5 shows no leads. Figure 3 is the only figure with a third lead and its third lead is under the display, which is not “the enclosure.” *See* EX1001, FIG. 3. *See also* EX1001, [0011] (“electronic signals can be transmitted through the steel or

aluminum enclosure”). EX1051, ¶150.

In addition, Claim 23 requires that the third pad is exposed for a “user’s skin’s contact with the third pad.” Figure 3 is the only figure with a third lead and its third lead is under the display, not exposed for a user’s skin contact. EX1051, ¶150.

Moreover, the specification does not support that the “third pad that is . . . in the second portion of the enclosure” and “the second and third pads detect signals through a second hand.” The specification mentions particular hands associated with one configuration of leads only: “leads 322 and 324 detect signals through a first hand, and lead 326 detects signals through the second hand.” EX1001, 8:48-49 Moreover, lead 326 is positioned under the touch screen display, not in a second portion. EX1051, ¶151. The annotated figures below illustrate claim scope changes:



Apple deviates further from the specification with substitute Claim 24, which recites that the “second and third pads” are “adjacent” pads with an electrically

isolating component inserted between them. Figure 3 is the only figure Apple relied upon that has three leads, but none of its leads are adjacent. Apple's expert even admitted "I don't think anyone would describe [leads] 322 through, 324, or 326 as adjacent to one another." EX1052 at 227:1-5. Thus, Claim 24 is not supported. EX1051, ¶152–153.

Claim 25 states that the first pad is "embedded in an inner surface" of a bezel. This is unsupported for the reasons provided above regarding Claim 22. *Id.*

Claim 25 further recites that the second pad is "exposed," but the first pad is not. The specification does not describe or suggest an embodiment with a "first pad" embedded under the "inner surface" of a "metal bezel" and a second pad "exposed." The specification does not contain any figure that shows an exposed pad and a pad embedded under. EX1051, ¶154.

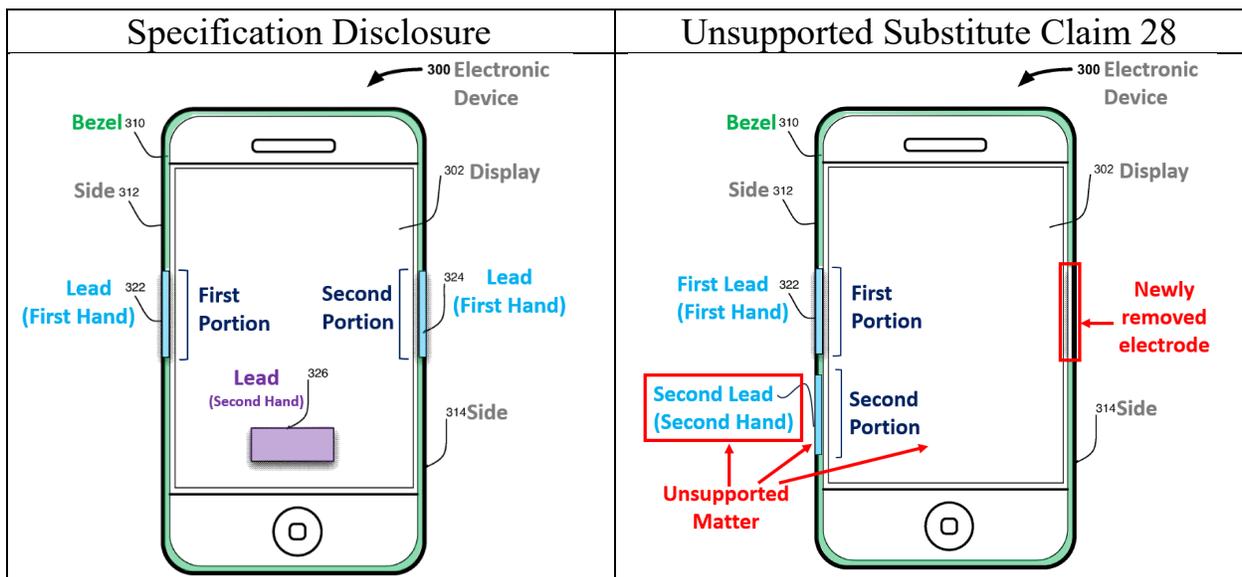
With regard to Claim 26, Apple has not shown that the claimed extraction and authentication have support. Apple relies on [0051] of EX2001 for support, but that paragraph teaches using lead 326 embedded under the display for authentication during the process of unlocking the device. Claim 1, from which Claim 26 depends, does not include a lead embedded under a display. EX1051, ¶155.

Claim 27 adds new matter that the second pad is "positioned underneath the exterior surface of the second portion" and that specifically the "first and second pads" are "adjacent pads." These limitations are unsupported for the same reasons

provided with respect to Claim 24. EX1051, ¶156.

Claim 28 includes additional unsupported features. Claim 28 uses the term “same face” to describe the location of the first and second pads, but the specification never uses the term “face” and never describes or illustrates pads being on the “same face of the electronic device.” Apple’s use of the term “face” is a clear attempt to capture watches with two electrodes on a single face. The written description requirement is meant to prevent attempts to cover products not originally described by the specification, like Apple has attempted here. EX1051, ¶157.

Substitute Claim 28 also requires different hands on two adjacent pads, which does not correspond with the specification’s disclosure. This limitation is not supported for the reasons discussed with regard to Claim 23. Moreover, Claim 28 would require significant modification to the disclosed embodiments, as illustrated below:



Therefore, substitute Claims 22-28 lack written description support. EX1051, ¶158.

**IV. THE PROPOSED SUBSTITUTE CLAIMS WOULD HAVE BEEN OBVIOUS OVER MARKEL IN VIEW OF MILLS**

The Petition showed how original Claims 1 and 12 (the claims from which the substitute claims depend) are unpatentable as obvious over Ground 2 of Markel in view of Mills. Petition, Section IV. Accordingly, this Opposition will address only the added limitations of the proposed substitute claims 22-28. *See Aqua Prod., Inc. v. Matal*, 872 F.3d 1290, 1326 (Fed. Cir. 2017). EX1051, ¶159.

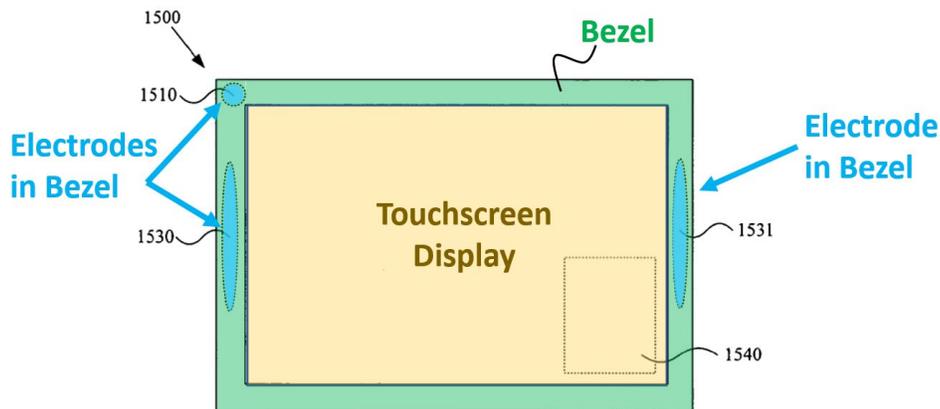
**A. Substitute Claim 22 Is Obvious over Markel and Mills**

Substitute Claims 22-28 would have been obvious to a POSITA in view of Markel (Figure 4, 15, or a combination) and Mills. The level of skill of a POSITA remains the same as in the Petition. Pet. at 7. EX1051, ¶159.

**1. “The electronic device of claim 12, further comprising a touch screen display, wherein the bezel extends around the touch screen display;”**

As discussed in Ground 2 of the petition, Markel teaches that video display device 140 is a touchscreen display. EX1005, [0034]. Further, Figure 4 illustrates additional aspects of the embodiment shown in Figure 1. EX1005, [0009]. As the board found, Figure 4 discloses generally the same embodiment as that shown in Figure 15 directed to “an exemplary computer display device.” Inst. Dec. at 43. Figure 15 discloses video display device 1500 that has a touchscreen. EX1005, [0034], [0078]. EX1051, ¶¶160-161.

With respect to the display in Figure 4, Markel teaches that the video display device 140 may include an electrode in “a *border of the display* or integrated into a touch screen.” EX1005, [0044]. Similarly, Figure 15 may have “an electrode 1510 on a border portion of the display device 1500,” an “electrode 1530 on a first side of the display device 1500,” “an electrode 1531 on a second side of the display device,” or “one or more electrodes 1540 on a touch screen portion of the display device 1500.” EX1005, [0078]. Markel’s display device 1500 also has a bezel extending around the touch screen with electrodes as shown below in the annotated Figure. EX1051, ¶¶ 162-163.



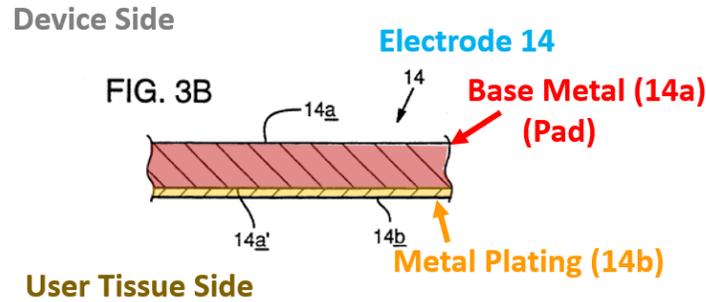
Moreover, a POSITA would have understood that the locations of the electrodes in display device 140 could be the same as the electrode locations shown in Figure 15. Markel contemplates having “[a] plurality of electrodes (or other sensors) ... disposed in any of a variety of locations” on the video display device with touchscreen 140. EX1005, [0044]-[0045]; Inst. Dec. at 43. Thus, a POSITA would have been motivated to position the electrodes in the bezel surrounding the

display 140 because it is a convenient location for the user to touch the electrodes without obstructing the display. Additionally, Markel notes that teachings related to “mobile communication device(s)” (i.e. FIGS. 1-9) can “apply to user interface devices discussed herein” (i.e. FIG. 15). *Id.*, [0068] (“It should be noted that various electrode characteristics discussed previously (e.g., electrode formation, placement, shape, size, integration, identification, numbers, features, etc.) apply to the user interface devices discussed herein as well as the mobile communication device(s) discussed previously.”). The electrode placement in Markel is not particularly limited and “[a] plurality of electrodes (or other sensors) may be disposed in any of a variety of locations.” *Id.*, [0045]. Providing electrodes in a bezel of a display would allow for additional touchpoints for cardiac measurement. *Id.*, [0037]-[0038]. EX1051, ¶¶164-165.

2. **“and wherein the first pad is embedded in an inner surface of the bezel.”**

Markel discloses a first pad (electrode) embedded in a bezel: “an electrode may be disposed on a video display device 140 (e.g., a border of the display or integrated into a touch screen)” and that “an electrode (or all electrodes) or other sensor may be substantially concealed (or hidden) from a user.” EX1005, [0040], [0044]. EX1051, ¶¶166-167.

Moreover, Mills (EX1006) teaches embedding a base metal electrode (14a, a pad) on the inner surface of a metal plating (14b), as shown in Figure 3B :



A POSITA would have been motivated to combine Markel’s concealed electrodes with Mills’ metal plating and would have had a reasonable expectation of success in doing so. EX1003, ¶¶84-87. *See also* Pet., §IV(B). For example, Mills provides its metal-plating composition over its electrodes for “aesthetic reasons.” *Id.*, 5:37-40. This plating also accomplishes Markel’s goal of having electrodes that are “substantially concealed (or hidden) from a user ... with little or no visible indication of the electrode presence.” EX1005, [0040]. Thus, Mills and Markel provide desirable aesthetic appearances for electrodes, and their combination would have been a “mere substitution of one element for another known in the field” that yields predictable results. *See KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740 (2007). A POSITA would have also been motivated to use the plating taught in Mills for various electrodes in Markel as Mills teaches its “plating [exterior surface 14b] also has been found to provide high conductivity and thus to produce a high quality electrical interface between an electrode such as electrode 14 and the patient’s skin surface, which may be very dry.” EX1006, 4:43-47. EX1051, ¶¶168-169.

**B. Substitute Claim 23 Is Obvious over Markel and Mills or Indefinite**

- 1. “The electronic device of claim 22, further comprising: a third lead comprising a third pad that is embedded in the second portion of the enclosure, wherein the third pad is configured to detect a third electrical signal of the user’s cardiac signal via the user’s skin’s contact with the third pad;”**

The limitations would have been obvious under any construction of “embedded in” that does not require the top surface of the pad to be covered by the enclosure. However, the limitation is indefinite if “embedded in” requires the top surface of the pad to be covered by the enclosure because, under that construction, the pad could not both be “embedded in” the enclosure and have contact with the user’s skin. As discussed above in Section IV.A.1 regarding Markel’s Figure 15, Markel teaches at least three leads (1510, 1530, 1531), including a third lead with a third pad that is embedded in the second portion of the enclosure (bezel) around a touchscreen. Markel’s third pad is configured to detect a third electrical signal via the user’s skin’s contact with the third pad. For example, Markel states that “[t]hough the previous exemplary illustrations generally discuss one or two electrodes . . . the MCD 100 may be adapted to detect cardiac activity of a user that is conductively coupled to at least two of a first, second and third (or N) electrodes.” EX1005, [0051]. Thus, Markel discloses these limitations, including detecting cardiac signals through first, second, and third electrodes (1510, 1530, 1531). EX1051, ¶¶170-172.

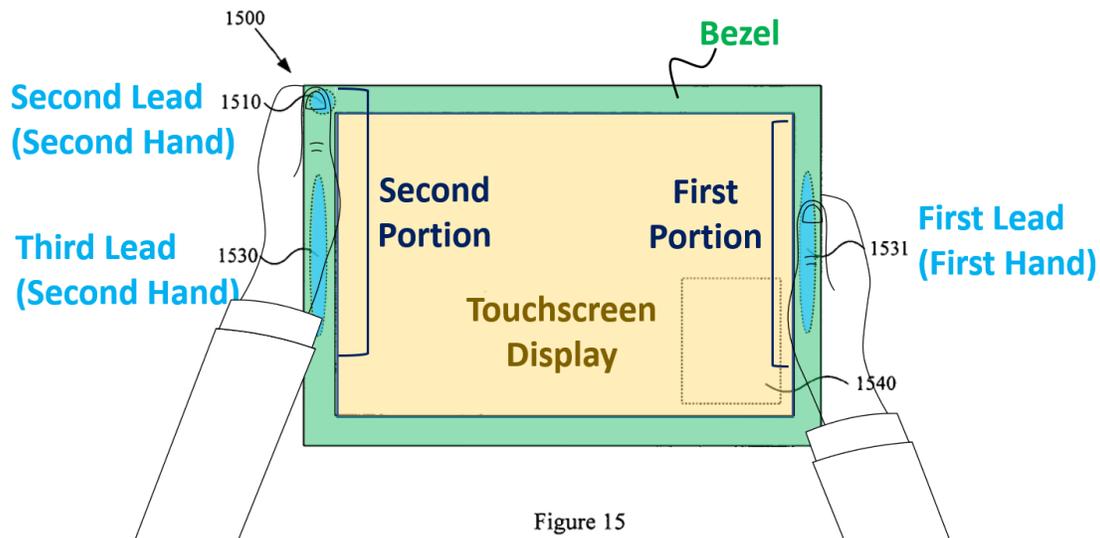
Markel also discloses contact between the user's skin and a third pad embedded in the second portion of the enclosure. Markel teaches two different options for such pad positioning. First, an electrode may have "a metallic surface exposed for user contact." EX1005, [0037]-[0039]. Second, an electrode may be "integrated into various molded components" such as where "*an electrode* (or all electrodes) or other sensor may be substantially concealed (or hidden) from a user." *Id.*, [0037], [0040]. Thus, Markel teaches the use of hidden and exposed electrodes and that the two options may be used interchangeably. Accordingly, it would have been an obvious design choice among "a finite number of identified, predictable solutions" to have one of the pads exposed for user's skin's contact (e.g. a third pad) while the other pad is embedded on an inner surface (e.g. "a first pad" recited in Claim 22). *KSR*, 127 S.Ct. at 1742. EX1051, ¶173.

2. **"and wherein the second pad is configured to detect the second electrical signal of the user's cardiac signal via the user's skin's contact with the second pad; wherein the first pad detects signals through a first hand, and the second and third pads detect signals through a second hand."**

As discussed in Section IV.B.1, Markel discloses a second pad configured to detect the second electrical signal via the user's skin's contact with the second pad. For example, Markel also discloses an "exposed" electrode surface. EX1005, [0037]. Thus, Markel discloses the first part of this limitation. EX1051, ¶174.

With regard to detecting signals "through a first hand" and "through a second

hand,” Markel teaches that electrodes may have a “*placement . . . for convenient access* for a user to contact both the first and second electrodes simultaneously (e.g., with different hands or different fingers).” EX1006, [0049]. A POSITA would have found it obvious to contact Markel’s second electrode along with Markel’s additional electrode (third electrode) with the same “second hand” to provide redundancy, noise cancellation for the signal, or as a reference/neutral electrode that may also include a right-leg drive configuration. *See* EX1006, [0051] (“third (or N) electrodes”); [0088] (“additional “Nth electrode”); EX1052 at 230:2-4 (Apple’s expert testifying “if you can have a third electrode, you have an opportunity to capture a cleaner signal”); EX1056, 4:12-18 (“one hand makes contact with two of the contacts, and the other hand makes contact with the third contact.”); *Id.*, 7:33-34; EX1057, abstract. The figure below shows how it would have been obvious that a user would have been able to touch three electrodes using two hands, as claimed:



A POSITA would have understood that a user can easily touch three electrodes with two hands in the Figure 4 format as well. EX1051, ¶¶175-176.

**C. Substitute Claim 24 Is Obvious Over Markel and Mills**

**1. “The electronic device of claim 23, wherein the second and third pads are adjacent pads;”**

As shown in Markel’s Figure 15 above in Section IV.B.2, Markel’s electrodes 1510 and 1530 are second and third pads that are adjacent. Likewise, a POSITA would have implemented the same configuration in Figure 4. EX1051, ¶177.

**2. “and wherein an electrically isolating component is inserted between the second and third pads.”**

Markel teaches this limitation, namely that an “insulating region 415 may separate” two adjacent electrodes. EX1005, [0045]; *see also* Pet. at 56-57. From this, a POSITA would have known that if electrodes are provided in relative proximity, an insulating portion would be needed. EX1052 at 230:7-231:5 (ECG electrodes would be “shorted out” without insulating between them). Because Markel’s electrodes 1510 and 1530 are provided adjacent to each other, Markel teaches that they should be separated by an isolating component. Moreover, a POSITA would have been motivated to provide an isolating component between the two adjacent electrodes to avoid crosstalk and mixing of signals. Thus, these limitations are disclosed by Markel and would have been obvious to a POSITA. EX1051, ¶178.

**D. Substitute Claim 25 Is Obvious Over Markel and Mills**

1. **“The electronic device of claim 1, wherein the first pad is embedded in an inner surface of an electrically conductive metal bezel that forms a portion of an exterior surface of the electronic device; and wherein the second pad is exposed on the exterior surface of the electronic device for direct contact from a user.”**

Having an electrode embedded on an inner surface of a bezel or exposed for user contact would have been obvious to a POSITA, as discussed in Sections IV.A.2 and IV.B.1. A POSITA would have found it obvious to make the bezel from a metallic conductive material to facilitate conduction of cardiac signals through the bezel. Mills teaches that a “high conductivity” metal plating covering the electrode would conduct cardiac signals to the electrode. *See supra* IV.A.2. Thus, a POSITA would have found these limitations obvious. EX1051, ¶¶179-180.

**E. Substitute Claim 26 Is Obvious over Markel and Mills**

1. **“The electronic device of claim 1, wherein the processor is further configured to extract one or more characteristics of the detected cardiac signal and compare the extracted ... characteristics with one or more characteristics previously stored in memory that were associated with an authorized user; and wherein if the extracted one or more characteristics match those of an authorized user, the electronic device authenticates the user.”**

Markel discloses a processor (MCD 1700) that can be used in each embodiment, Figures 1-16. EX1005, [0085]. The processor extracts a characteristic of the cardiac signal and compares it to previously stored characteristics of an authorized user. The device performs “spectral analysis on a cardiac signal” and its processor analyzes “the cardiac information by determining a difference between a

current cardiac signal [and] at least one previous cardiac signal.” *Id.*, [0130]. This analysis detects a cardiac pathology, but a POSITA would understand that Markel likewise performs a comparison to identify a user’s cardiac signal from “acquired information in the memory 1740 (e.g., indexed by user identification).” *Id.*, [0098]. The processor contains “a profile (e.g., stored in the memory 1740)” and “cardiac information acquisition module 1710 may store acquired cardiac information (or a portion thereof) in the memory 1740.” *Id.*, [0093], [0098]. EX1051, ¶181.

Markel’s processing circuitry uses this information and is “adapted to identify the user of the MCD 1700. For example, such identification (or authentication) may be utilized in an exemplary scenario where a variety of users may be utilizing the MCD 1700.” EX1005, [0097]. Thus, Markel’s device “authenticates” an “authorized user.”

Moreover, a POSITA would have found it obvious in view of Markel to do such spectral analysis and comparison for authentication. For example, a POSITA would have found authentication beneficial to 1) ensure device security, 2) add a unique identifier used in conjunction with fingerprint reading or other biometrics, 3) enable an identifier that does not require keys or passcodes, and 4) secure protected healthcare information with the user. EX1051, ¶¶182-184; *see also* EX1055.

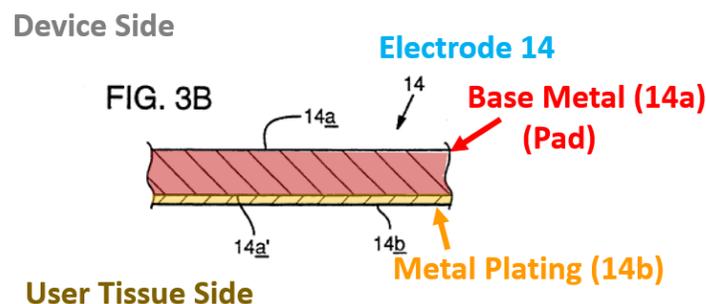
**F. Substitute Claim 27 Is Obvious Over Markel and Mills**

1. **“The electronic device of claim 1, wherein the exterior surface of the enclosure comprises an exterior surface of the second portion, wherein the second pad is positioned underneath the exterior surface of the second portion of the enclosure;”**

Figure 15 of Markel illustrates a bezel on the exterior surface of the enclosure that surrounds a display screen and contains pads, as discussed in Section IV.A.2.

Accounting for the dependency on Claim 1, both the first and second electrodes are “positioned underneath the exterior surface” of the bezel. Markel teaches exactly this arrangement: “an electrode (or *all electrodes*) or other sensor may be substantially concealed (or hidden) from a user.” *Id.*, [0040]. As Markel explains, these concealed electrodes necessarily contain a pad or “conductive material” for transferring signals. *Id.*, [0037]. EX1051, ¶¶185-186.

Mills (EX1006) illustrates embedding a base metal electrode (14a, a pad) under a metal plating (14b) in its Figure 3B:



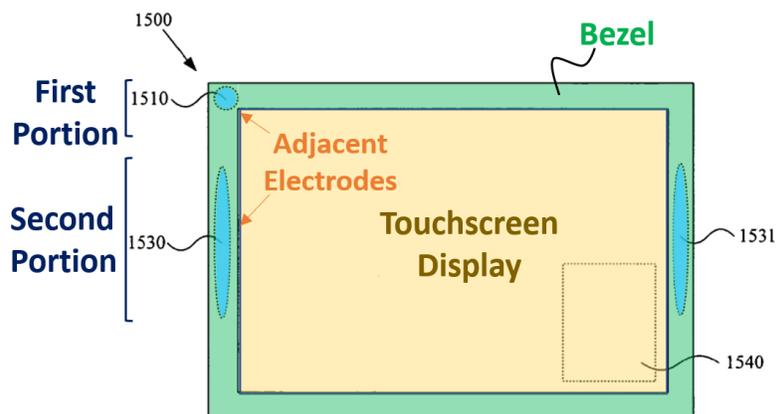
A POSITA would have been motivated to combine Markel’s electrodes with the plating of Mills for the reasons discussed above in Section IV.A.2. As one

example, a POSITA would have been motivated to use this plating on the “exterior surface of [a] second portion” of the bezel as Mills teaches the plating is aesthetically pleasing, “provide[s] high conductivity,” and “produce[s] a high quality electrical interface” for the electrode. EX1006, 4:35-47. EX1051, ¶¶187-188.

2. **“wherein the first and second pads are adjacent pads; and wherein an electrically isolating component is inserted between the first and second pads.”**

Markel’s “first and second pads” in Figure 15 are “adjacent” (Electrodes 1510 and 1530). *See supra* IV.C.2. Markel also teaches that adjacent pads should be electrically isolated and discloses that pushbutton electrodes in relative proximity should be “separated by an insulating portion 243.” EX1005, [0047]. A POSITA would have known to include such isolating component to prevent cross-talk or mixing of signals. *See supra* IV.C.2; EX1052 at 230:7-231:5. EX1051, ¶189.

Because electrodes 1510 and 1530 in Markel Figure 15 are adjacent to each other, a POSITA would have been known to include an insulating portion between these two electrodes to avoid crosstalk and mixing of signals from these electrodes:

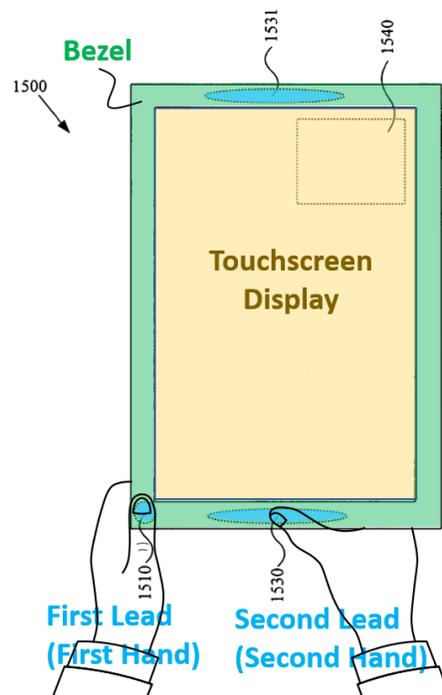


Thus, Claim 27 would have been obvious. EX1051, ¶190.

**G. Substitute Claim 28 Is Obvious Over Markel and Mills**

1. **“The electronic device of claim 27, wherein the first pad detects signals from a first hand and the second pad detects signals from a second hand;”**

Markel discloses a configuration in which a “first pad” (1510) “detects signals from a first hand” and a second pad (1530) “detects signals from a second hand.” For example, as discussed in Section IV.B.2, Markel’s teachings enable the particular “placement” of the electrodes to “provide for convenient access for a user to contact” electrodes “with different hands or different fingers.” EX1005, [0049]. EX1051, ¶192. Thus, Figure 15 of Markel discloses this limitation as shown below:



Multiple scenarios satisfy the claims, such as the portrait orientation above where both hands are at the bottom of the display, or where one hand is on lead 1510

while the other is touching a power button near 1530. As part of an apparatus claim, the electrodes need only be capable of a configuration where different hands touch electrodes 1510 and 1530. *See ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1361 (Fed. Cir. 2018) (a reference may anticipate or render obvious an apparatus claim if the disclosed apparatus “is reasonably capable of operating so as to meet the claim limitations”). Finally, electrode placement is not limited to that shown in the figures and may be modified, per Markel. *See* EX1005, [0052]; EX1051, ¶¶193-194.

2. **“wherein the first and second portions of the enclosure are located on a same face of the electronic device;”**

As shown in reproduced Figure 15 in IV.G.1 above, Markel’s electrodes 1510 and 1530 are on the same face. Additionally, Markel teaches flexibility in the location of its electrodes: “A plurality of electrodes (or other sensors) may be disposed in any of a variety of locations.” *Id.*, [0045]; EX1051, ¶195.

3. **“wherein the first and second portions of the enclosure each comprise a metallic conductive portion exposed for direct user contact.”**

Using an exposed conductive material, such as metal, for the “first and second portions of the enclosure” is disclosed by both Markel and Mills. For example, Markel teaches that its “[e]lectrodes may generally comprise conductive material” and that there may be “a metallic surface exposed for user contact.” *Id.*, [0037]. Since the electrodes (1510, 1530) in Markel Figure 15 are in the bezel of the device, a POSITA would have understood that the bezel likewise has a “metallic conductive

portion exposed for direct user contact.” EX1051, ¶196.

Regarding the embedding of the electrode pads under a metal portion, Mills teaches a metal electrode plating that covers electrodes embedded under the surface of the enclosure, as discussed *supra* IV.F.1. For example, a POSITA would have been motivated to use this metal plating over the “first and second portions” to “produce a high quality electrical interface between an electrode such as electrode 14 and the patient's skin surface.” EX1006, 4:43-47. Also, the plating provides a “smooth finish” that is desirable for “aesthetic reasons.” *Id.*, 4:35-39. EX1051, ¶197.

Thus, Claim 28 would have been obvious in view of Markel and Mills.

## V. CONCLUSION

For the foregoing reasons, the Board should deny Apple’s motion to amend.

Respectfully submitted,

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Dated: April 1, 2024

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**CERTIFICATE OF SERVICE**

I hereby certify that, pursuant to 37 C.F.R. §42.105, a true and correct copy of the foregoing **PETITIONER'S OPPOSITION TO PATENT OWNER'S CONTINGENT MOTION TO AMEND** is being served electronically on April 1, 2024, to the e-mail addresses shown below:

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