UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASIMO CORPORATION
Petitioner,

v.

APPLE INC.,
Patent Owner

Case IPR2023-00745
U.S. Patent 10,076,257

PATENT OWNER'S PRELIMINARY RESPONSE

TABLE OF CONTENTS

LIST OF CHALLENGED CLAIMS

Claim Elements	Claim Limitations
1[pre]	An electronic device for detecting a user's cardiac signal, comprising:
1[a]	an enclosure;
1[b]	a heart sensor configured to detect the user's cardiac signal,
1[b.1]	the heart sensor comprising: a first lead comprising a first pad that is embedded in a first portion of the enclosure,
1[b.2]	wherein an exterior surface of the enclosure comprises an exterior surface of the first portion,
1[b.3]	wherein the first pad is positioned underneath the exterior surface of the first portion,
1[b.4]	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
1[b.5]	[the heart sensor comprising:] a second lead comprising a second pad embedded in a second portion of the disclosure 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;
1[c]	a processor coupled to the heart sensor and configured to receive and process the detected cardiac signal,
1[c.1]	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,
1[c.2]	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.
2	The electronic device of claim **1**, wherein the first portion and the second portion are located on opposite sides of the electronic device.
3	The electronic device of claim **1,** wherein the first portion is electrically isolated from the second portion.
4	The electronic device of claim **1,** wherein: the first portion is separated from the second portion by a third portion of the enclosure; at least the third portion is constructed from a material having a first conductivity; and

	the first conductivity is insufficient to transmit the first electrical signal from the first pad to the second pad via the third portion.
8	The electronic device of claim **1,** wherein: the enclosure further comprises at least one pocket underneath the exterior surface of the enclosure; and at least one of the first pad and the second pad is placed within the at least one pocket.
9	The electronic device of claim **1**, further comprising: a display, wherein the enclosure supports the display, and wherein at least a portion of the exterior surface of the enclosure forms at least a portion of an exterior surface of the electronic device behind the display; and a third lead embedded with the display, wherein the third lead is configured to detect a third electrical signal of the user's cardiac signal via the user's contact with at least one of the third lead and the display.
10	The electronic device of claim **1,** wherein the second lead is configured to detect the second electrical signal of the

	user's cardiac signal via the user's contact with the second portion of the enclosure.
11	The electronic device of claim **1,** wherein the second lead is configured to detect the second electrical signal of the user's cardiac signal via the user's contact with the second lead.
12	The electronic device of claim **1**, wherein the first portion of the enclosure is a bezel.
13	The electronic device of claim **1**, wherein the second portion of the enclosure is a bezel.
14	The electronic device of claim **1,** wherein an interior surface of the enclosure comprises an interior surface of the first portion, wherein the first pad is positioned on the interior surface of the first portion.
15[pre]	An electronic device for detecting a user's cardiac signal, comprising:
15[a]	an enclosure;
15[b]	a display screen exposed to the user through an opening in the enclosure;
15[c]	a heart sensor configured to detect the user's cardiac

	signal, the heart sensor comprising:
15[c.1]	a first lead embedded in a first portion of the enclosure of the electronic device, wherein the first lead is configured to detect a first electrical signal of the user's cardiac signal via the user's contact with at least one of the first lead and the first portion of the enclosure of the electronic device; and
15[c.2]	a second lead embedded in the display screen of the electronic device, wherein the second lead is configured to detect a second electrical signal of the user's cardiac signal via the user's contact with at least one of the second lead and the display screen of the electronic device; and
15[d]	a processor coupled to the heart sensor and configured to process the first and second electrical signals of the user's cardiac signal.
16	The electronic device of claim **15**, 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.

17	The electronic device of claim **16**, wherein the second lead is configured to detect the second electrical signal of the user's cardiac signal via the user's contact with the second lead.
18	The electronic device of claim **16**, wherein the second lead is configured to detect the second electrical signal of the user's cardiac signal via the user's contact with the display screen.
19	The electronic device of claim **15**, wherein: the first portion of the electronic device comprises a bezel of the enclosure; the electronic device further comprises a non-conductive component positioned between the bezel and the display screen for electrically isolating the first lead from the second lead.
20	The electronic device of claim **15**, wherein the first lead is configured to detect the first electrical signal of the user's cardiac signal via the user's contact with the first portion of the enclosure.
21	The electronic device of claim **20**, wherein the second lead is configured to detect the second electrical signal of the user's cardiac signal via the user's contact with the second lead.

22	The electronic device of claim **20**, wherein the second lead is configured to detect the second electrical signal of the user's cardiac signal via the user's contact with the display screen.

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.107(a), Patent Owner, Apple Inc. ("Apple"), submits this Preliminary Response to the Petition for *Inter Partes* Review ("IPR") of U.S. Patent No. 10,076,257 ("the '257 Patent") filed by Masimo Corporation ("Petitioner" or "Masimo").

Masimo fails to meet its burden of showing a reasonable likelihood that it would prevail with respect to any of claims 1-4 and 8-22 ("the Challenged Claims") of the '257 Patent under either of its two invalidity grounds (Petition, 1):

Ground 1	Claims 1-4, 8, 10, 11 and 14 are allegedly unpatentable as anticipated by Mills
Ground 2	Claims 1-4 and 8-22 are allegedly unpatentable as obvious over Markel in view of Mills

Under its anticipatory Ground 1, Masimo fails to demonstrate that Mills teaches claims 1-4, 8, 10, 11 and 14. For example, Mills fails to disclose Element 1[c] of independent claim 1, which recites "a processor coupled to the heart sensor and configured to receive and process the detected cardiac signal." EX-1001, claim 1. With respect to that element, Masimo erroneously alleges that a memory component present in Mills is the claimed processor, and, furthermore, fails to demonstrate that the relied-upon memory component is "configured to…process the detected cardiac signal." Petition, 31; *see In re Royka,* 490 F.2d 981, 983

(C.C.P.A., 1974) ("It is elementary that to support an anticipation rejection, all elements of the claim must be found in the reference.").

Under its obviousness-based Ground 2, Masimo fails to demonstrate that Markel in view of Mills renders obvious claims 1-4 and 8-22 for multiple reasons.

For example, with respect to independent claim 1, Masimo proposes modifying Markel's device based on Mills's configuration, but fails to explain why a POSITA would allegedly have had a reasonable expectation of success when modifying Markel in the proposed manner. For example, Masimo fails to provide corroborating evidence to support its proposed combination, and instead relies upon uncorroborated testimony from its declarant that does nothing other than mirror the arguments presented within Masimo's petition.

As another example, with respect to independent claim 15, Masimo improperly picks and chooses elements from two different embodiments of Markel without demonstrating a *prima facie* case of obviousness for combining features from those two different embodiments. *See e.g., Personal Web Technologies, LLC v. Apple, Inc.,* 848 F. 3d 987, 993-994 (Fed. Cir. 2017) (overturning finding of obviousness where the Board's "reasoning seems to say no more than that a skilled artisan, once presented with the two references, would have understood that they could be combined. And that is not enough: it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention.").

For at least these reasons, the arguments presented in the Petition fall short of satisfying Masimo's burden of showing "that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). Accordingly, Apple respectfully submits that the Board should deny institution of Masimo's deficient petition.

II. THE '257 PATENT

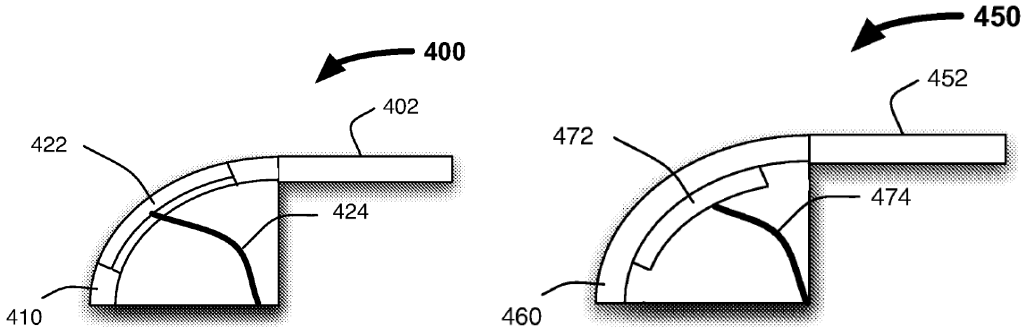
A. Background of the Invention

The '257 Patent is directed to an electronic device that includes a sensor for detecting a user's cardiac signal. EX-1001, 2:1-2. Among other benefits, the sensor can be used to unlock the device in response to "authenticat[ing] a user based on the attributes of the user's heartbeat." *Id*., 1:49-2:3.

A "heart sensor 112 can include one or more leads connected to the exterior of the electronic device." EX-1001, 6:3-8. "The cardiac signals detected by the heart sensor leads can be coupled to a processor incorporated in heart sensor 112, or instead provided to processor 102." *Id*., 6:10-16. "The processor may then analyze the received signals and generate, from the received signals, one or more characteristic quantities of the user's heartbeat or heart rate for authentication." *Id*.

The '257 Patent provides several example configurations for its disclosed electronic device. For example, "FIG. 4A is a cross-sectional view of an illustrative electronic device having a bezel with an embedded heart sensor lead,"

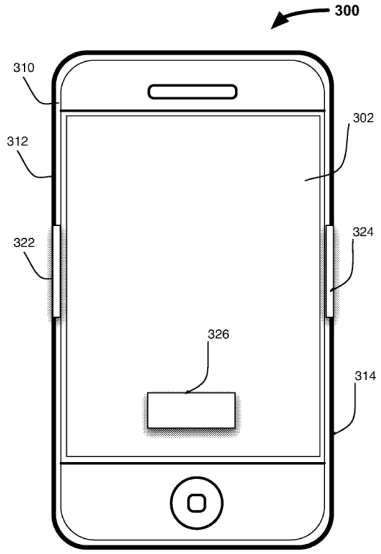
where "lead 422 is exposed to the user." *Id*., 9:18-26. "FIG. 4B is a cross-sectional view of another illustrative electronic device having a bezel with an embedded heart sensor lead," where lead 472 is placed "underneath the outer surface of the bezel." *Id.* 9:45-49. Each of lead 422 in FIG. 4A and lead 472 in FIG. 4B is coupled to a respective connector (424 and 474) that "transmit[s] the signals to a processor" of the device. *Id*., 9: 24-26, 9:51-52.



Left: '257 Patent, FIG. 4A; Right: '257 Patent, FIG. 4B

The '257 Patent also discloses an embodiment where "[a] lead 326 [is] embedded in or behind display 302." EX-1001, 8:40-52. "Lead 326 can be 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*.



'257 Patent, FIG. 3

B. Overview of the Prosecution History

The application leading to the '257 Patent was filed on December 20, 2013, claiming priority to application number 12/358/905 filed on January 23, 2009. The '257 Patent went through an examination that involved three substantive office actions including prior art rejections based on Ceballos (US 6,522,915), Gilles (US 4,635,646), and Weiss (US 5,632,926). Subsequently, the '257 Patent was allowed on May 22, 2018, and issued on September 18, 2018.

III. Level of Ordinary Skill

A person of ordinary skill in the art on or about the claimed priority date of the '257 Patent ("POSITA") 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.

IV. Claim Construction

Masimo proposes claim construction for multiple terms recited in claim 1. Petition, 7-12. On the present record, and at this time, Patent Owner discerns no need to construe explicitly any claim language because doing so would have no effect on analyses of Masimo's asserted grounds, and would not assist in resolving the present controversy between the parties. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those 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)). Apple reserves the right to address any construction proposed by Petitioner or the Board.

V. The Proposed Grounds Fail to Demonstrate that the Prior Art Anticipates or Renders Obvious the Challenged Claims

A. Ground 1

Masimo fails to demonstrate that Mills (EX-1006) anticipates claim 1 of the '257 Patent. For example, Masimo fails to demonstrate anticipation of at least claim feature 1[c], which recites: "a processor coupled to the heart sensor and configured to receive and process the detected cardiac signal." EX-1001, claim 1. As discussed below, Masimo maps the processor recited in claim 1, to a VLSI that Mills specifies is a SRAM memory. Petition, 31. Masimo fails to demonstrate that the relied-upon SRAM memory is a processor. Further, even assuming for the sake of argument that that memory is a processor, Masimo's fails to demonstrate that the memory is "configured to receive and process the detected cardiac signal" as claimed.

In more detail, Masimo asserts that "Mills discloses that the housing 12 comprises a very-large scale integrated (VLSI) circuit chip[.]" Petition, 31. Masimo cites to ***5:18-19 of Mills***, and asserts that "Mills further specifies that the VLSI is surface-mounted on the top side of printed circuit board (PCB) 50,"[1] and that "[e]lectrodes 14 and 16 are electrically connected to the PCB 50 via a

[1] Unless indicated otherwise, emphases throughout this Preliminary Response have been added.

respective spring (60/62)." *Id*. Masimo erroneously concludes from these passages that "a POSITA would understand ***the VLSI is a processor*** coupled to the heart sensor (electrodes) and is configured to receive and process the detected cardiac signal." *Id*.

Masimo's analysis is wrong at least because the VLSI is a very-large scale integrated circuit chip, not a processor *per se*. While, in general, a VLSI chip can include a processor, the VLSI chip that Masimo refers to in 5:18-19 of Mills is instead a "SRAM chip 38." EX-1006, 5:18-19. As Mills discloses, and as would have been well-known in the art prior to the '257 Patent's earliest priority date, a "static read-and-write ***memory (SRAM)*** …operates as means for recording digital data produced," not as a signal processor. EX-1006, 3:29-31, 5:18-19.

Mills does not disclose a processing function for SRAM 38, and neither Mills nor Masimo's petition explain why a POSITA would have understood a memory device, such as SRAM 38, to include the processing functionality recited in claim 1. For at least this reason, Masimo fails to demonstrate that the relied-upon VLSI chip is "configured to [] process the detected cardiac signal," as required by independent claim 1's Element 1[c].

Moreover, Masimo's Ground 1 analysis is further deficient because it shows only that an SRAM is coupled to the electrodes in Mills, and does not demonstrate disclosure of "***a processor*** [being] coupled to the heart sensor," as recited in claim

1. *See* Petition, 31 (citing to VLSI that was disclosed in 5:18-19 of Mills, which is an SRAM.); *see also* EX-1006, 5:18-19 ("[a] VLSI chip, which is surface-mounted on the top side of PCB 50, is SRAM chip 38.").

As noted above, Masimo equates the VLSI disclosed in 5:18-19 of Mills to a processor that is "surface-mounted on the top side of printed circuit board (PCB) 50," and assumes that "[e]lectrodes 14 and 16 are electrically connected to the PCB 50 via a respective spring (60/62)." Based on its assumptions, Masimo erroneously concludes that "***the*** VLSI is a processor coupled to the heart sensor (electrodes)," presumably based on the notion that both the VLSI and the electrodes are connected to the PCB. Petition, 31; *see also id*., 31 ("electrode 14 [is] connected to the leaf spring 62, which connects electrode 14 to the VLSI processor….Accordingly, leaf spring 62 is a first connector coupling electrode 14 (first pad) to the processor of Mills."); *id*., 33 ("[electrode] 16 [is] connected to the coil spring 60 which in turn connects to a circuit pad 58 on PCB 50 and the VLSI."). While Masimo focuses on showing that electrodes 14, 16 in Mills are coupled to VLSI through their respective connections to a PCB, Masimo ignores the fact that the cited VLSI in Mills is a memory chip—i.e., an SRAM—rather than a processor. *See* Petition, 31 (citing to the "VLSI chip" disclosed in 5:18-19 of Mills). Thus, Masimo also fails to show ***coupling*** of a heart sensor to a processor as required by independent claim 1 of the '257 Patent.

Masimo also attempts to argue based on citation to an alleged microprocessor noted in Mills's background section that Mills would include the claimed processor, but cannot justify reliance, in alleging anticipation, on two separate embodiments of a reference. Even setting that issue aside, Masimo further fails to demonstrate that the alleged microprocessor is "configured to receive and process the detected cardiac signal" of claim 1. EX-1001, claim 1.

In more detail, Masimo cites to the background section of Mills and states that "Mills also discloses its 'microprocessor and associated electronics, including firmware executed thereby, employs a digital bandpass filter reliably to detect ECG signals.'" Petition, 31. However, Masimo and its declarant fail to explain how "a digital bandpass filter" anticipates "*processing [a] detected* cardiac signal."

For at least these reasons, Masimo fails to demonstrate that Mills discloses each and every element recited in claim 1.

B. Ground 2

1. Claim 1

Masimo's Ground 2 combination of Markel with Mills relies upon impermissible hindsight, fails to provide details regarding the device alleged to result from the combination, and fails to demonstrate that a POSITA would have had a reasonable expectation of success in combining the teachings of the two references.

Masimo speculates, without support from corroborating evidence, that "It would have been obvious to incorporate the pad (leaf spring 62) teachings of Mills into the device of Markel." Petition, 47. For its alleged motivation to combine, Masimo relies primarily on its expert declaration to assert that "[a] POSITA seeking to implement Markel's device would look to Mill's [*sic*] disclosure for ways to internally connect the electrodes of Markel to internal electronic components using pads." *Id.*, 47-48. Masimo then concludes that "a POSITA would utilize the leaf spring 62 taught by Mills to connect the electrodes 410b, 420b of Markel to internal processing components taught by Markel." *Id*.

Yet, in reaching this conclusion, Masimo and its expert fail to demonstrate that they are relying upon anything other than hindsight-based reconstruction of the claims, at least because the relied-upon "motivation" is merely a suggestion by Masimo that a POSITA *could* have combined teachings of the two references, rather than a demonstration that the POSITA actually *would* have combined the teachings of the two references. For at least that reason, Masimo's Ground 2 combination relies upon impermissible hindsight, and fails to demonstrate obviousness of the Challenged Claims. *See In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971); *In re Dembiczak*, 175 F. 3d 994, 999 (Fed. Cir. 1999); *In re Gartside*, 203 F.3d 1305, 1319 (Fed. Cir. 2000).

Further, in its attempt to support its conclusory assertions regarding alleged motivation, Masimo relies upon a declaration that merely reproduces arguments presented within the Petition, without corroborating evidence. The lack of corroboration for Masimo's proposed combination further highlights that the combination is offered based on nothing other than impermissible hindsight. *See*, *e.g.*, *Xerox Corp*., *et. al*. *v. Bytemark, Inc.*, IPR2022-00624 Pap. 9 (PTAB Aug. 24, 2022)(precedential) (denying institution of *inter partes* review, criticizing in doing so an expert declaration that "merely repeats, verbatim, the conclusory assertion for which it is offered to support," and noting that "[e]xpert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."); *Upjohn Co. v. Mova Pharm. Corp*., 225 F.3d 1306, 1311 (Fed. Cir. 2000) ("Lack of factual support for expert opinion to factual determinations, however, may render the testimony of little probative value in a validity determination."); *see also In re NTP, Inc.,* 654 F.3d 1279, 1299 (Fed. Cir. 2011) (internal quotations omitted) ("[c]are must be taken to avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit.")

Furthermore, Masimo did not provide details regarding the device allegedly resulting from the combination of Markel and Mills sufficient to demonstrate that a

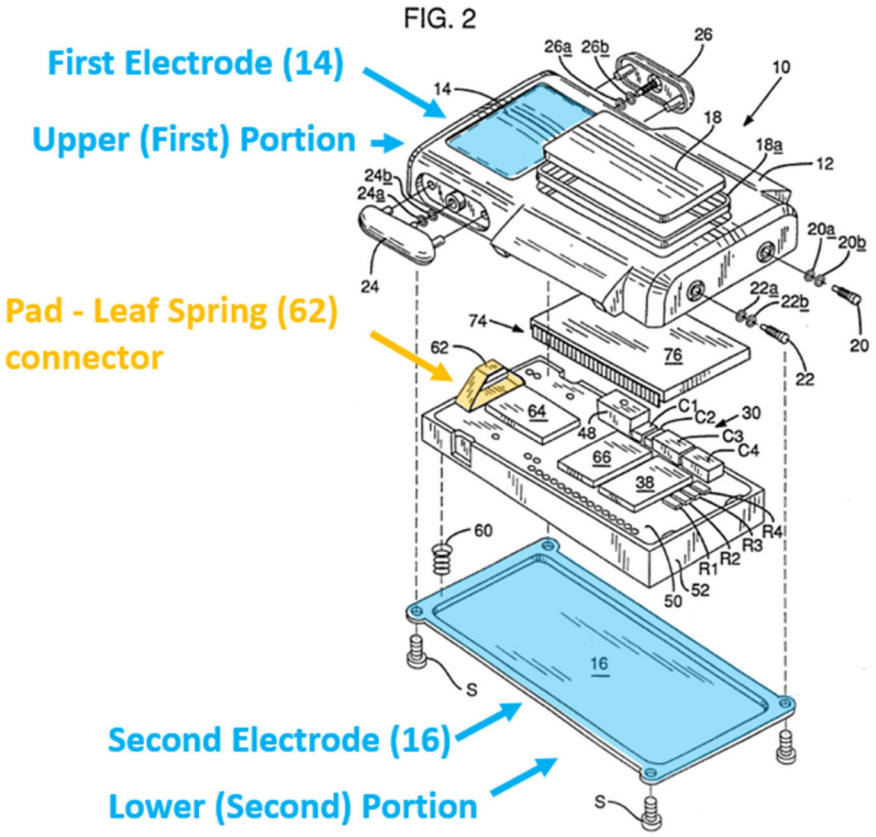
POSITA would have had a reasonable expectation of success in combining the relied-upon teachings of these two references. *See, e.g.*, *Samsung Elecs. Co. v. Elm 3DS Innovations, LLC*, 925 F.3d 1373, 1380-1381 (finding that "[t]he Board's finding as to a lack of reasonable expectation of success is supported by substantial evidence" because the fabrication processes that Petitioner took from two references and proposed combining, were "incompatible" with each other); *Endo Pharmaceuticals Inc. v. DepoMed, Inc.,* IPR2014-00654 (PTAB Sep.tember 21, 2015) ("establishing persuasively a reasonable expectation of successfully combining elements known in the art first requires some clear articulation of that combination"); *id*., 27 ("We agree with Patent Owner that Petitioner's obviousness challenge amounts to picking and choosing certain preferred attributes of the various references and combining them to yield the claimed invention"). While Masimo asserts that "[a] POSITA would have an expectation of success in the combination as it is *a mere rearrangement of known mechanical components in known ways* in a complementary device," (Petition, 48), the proposed combined device in reality would have been understood to result in complications that Masimo has neither addressed nor proposed to resolve.

First, Masimo asserts that a "POSITA would utilize the leaf spring 62 taught by Mills to connect the electrodes 410b, 420b of Markel to internal processing components taught by Markel." Petition, 47-48. But Masimo does not explain

why the POSITA would deviate from Mills's disclosure of using *only one* leaf spring for connecting one electrode to its PCB and a coil spring for connecting its other electrode to the PCT, and instead use two leaf springs for each of Markel's electrodes.

Unlike Masimo's proposed combination, Mills specifically discloses a device that includes one leaf spring 62 to connect one electrode (14) to an ECG amplifier on PCB 50, and one coil spring 60 to connect the other electrode (16) to the ECG amplifier. EX-1006, 4:64-5:3, ("connecting lower electrode 16 via a coil spring 60 to one signal input terminal of ECG amplifier 32," and "[u]pper electrode 14 is connected to the other signal input terminal of ECG amplifier 32 via a generally trapezoid-shaped, split and thus slidably yielding, leaf spring 62 connected to a circuit pad formed on the top side of PCB 50."). Mills does not teach or suggest using *two* leaf springs for connecting both its two electrodes to the PCB.

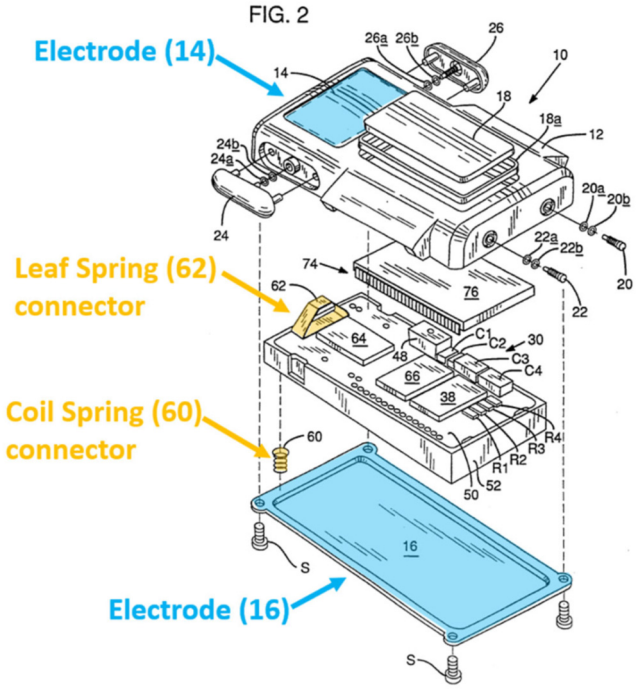
Moreover, Masimo fails to explain why a POSITA would deviate from Mills's disclosure, which uses this leaf spring and coil complementary configuration, and instead connect each of the two electrodes 410b and 420b in Markel to a processing component by using solely leaf springs for both electrodes.



Annotated FIG. 2 of Mills (EX-1006), as presented in Petition, at, pg. 46.

Second, there are stark differences between the positioning of the electrodes in Markel as compared to electrode positioning in Mills that make incorporation of Mills leaf spring 62 into Markel's device more than "*a mere rearrangement of known mechanical components in known ways* in a complementary device," as asserted by Masimo. Petition, 48. By ignoring those differences, Masimo fails to explain how the forms of connection disclosed in Mills could be applied to Markel, as further discussed below.

As shown in the figures presented below, the two electrodes 14 and 16 in Mills are positioned on opposite sides of a frontal plane of housing 12, and PCB 50 is positioned in parallel to the frontal plane, which is also parallel to planes of the two electrodes. Markel, however, presents a significantly different configuration than the one disclosed in Mills, which shows that the "first electrode [is] placed on the left side portion 410…, and a second electrode [is] placed on the right side portion 420." EX-1005, [0045]. Thus, contrary to Masimo's assertion, more than "*a mere rearrangement of known mechanical components in known ways* in a complementary device" would be required to use "the leaf spring 62 taught by Mills to connect the electrodes 410b, 420b of Markel to internal processing components taught by Markel." Petition, 47-48.



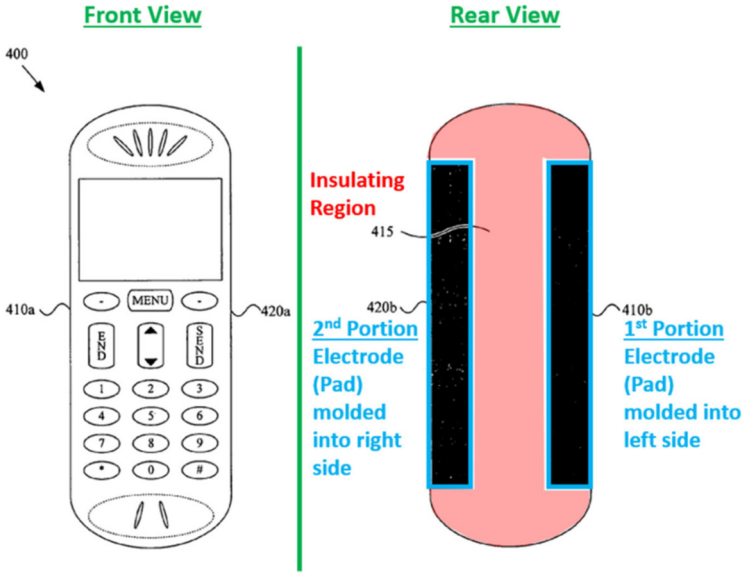


Figure 4

Top: annotated FIG. 2 of Mills (EX-1006), as presented in Petition, at, pg. 46;

Bottom: annotated FIG. 4 of Markel as presented in Petition, at, pg. 43.

For example, in Mills, all of the electrodes 14 and 16, the leaf spring 62's top surface, and the PCB 50 are formed on *parallel* planes. Those parallel planes are different frontal planes that are *perpendicular to a side plane that extends along the width of Mills device*.[2] *See* FIG. 2 of Mills above.

Masimo asserts that "[a] POSITA seeking to implement Markel's device would look to Mill's [*sic*] disclosure for ways to internally connect the electrodes of Markel to internal electronic components using pads." Petition, 47. By that logic, a POSITA following Mills's configuration, would have placed the electronic components of Markel on a PCB, and the PCB in between the two electrodes 410b/420b of Markel. Furthermore, by following Mills, the POSITA would have placed the PCB in *parallel to the two electrodes* to supposedly connect the electrodes to the PCB by leaf springs like in one Masimo cited from Mills's configuration. However, in such a modified configuration of Markel, the PCB would be in parallel to—not perpendicular to—the width side of Markel's device

[2] The term "width" of a device as used in this document refers to a distance between front and rear surfaces of the device. For example, the width of Mills's device is approximately the distance between electrodes 14 and 16. The width of Markel's device is the distance between the front and rear surfaces shown in Markel's FIG. 4.

400. But such configuration would no longer follow Mills's configuration, where the PCB plane is perpendicular to the width side of Mills's device.

Further, the above-described orientation of the PCB plane in the alleged modified Markel device would need an increase in the width dimension of Markel's device to enclose the PCB between the front and the rear surfaces of the device. But this would result in a bulky device that is "cumbersome and inconvenient," which is what Markel avoids. *See* EX-1005, [0002]. Further, placing the PCB perpendicular to the front and rear surfaces (and parallel to the side electrodes) would complicate electrical connections of the PCB to user-interface components (e.g., bottoms, display, etc.) implemented on the front surface of device 400 in Markel. *See* EX-1005, [0034] (naming example components implemented on the front surface of the device, including display 140, speaker 142, and buttons 130-138).

On the other hand, if a POSITA orients the PCB to be perpendicular to the width side (i.e., parallel to the front and rear surfaces) of Markel's device, the POSITA would require more details—beyond what is provided in Mills's disclosure— on how to connect Markel's electrodes 410b/420b to such an oriented PCB.

For at least these reasons, Masimo has failed to demonstrate a *prima facie* case of obviousness with respect to independent claim 1.

2. Claim 15

Masimo's assertion of obviousness with respect to claim 15 fails as well, both because (i) Masimo's proposed combination of Markel and Mills does not provide a *prima facie* case of obviousness, and (ii) Masimo improperly mixed and matched multiple embodiments of Markel without explaining why modifying one embodiment based on the other would have been obvious. *See* e.*g., Abiomed, Inc. v. Maquet Cardiovascular, LLC,* IPR2017-01204, Paper 8 (PTAB October 23, 2017) (denying institution where the petitioner "fail[ed] to provide sufficient rationale to combine the teachings of [the prior art references'] different embodiments" and "fail[ed] to explain sufficiently *why* one skilled in the art would have found it obvious to combine those teachings.").

First, Masimo used the same line of arguments as it did for claim 1 to assert that combining Markel with Mills would have been obvious. *See* Pet, 72-73. In doing so, however, and as explained above with respect to claim 1, Masimo relied upon impermissible hindsight, and failed to demonstrate a reasonable expectation of success for the device alleged to result from its hindsight-driven combination. *See* §V.B.1, *supra*.

Second, Masimo relied upon two different embodiments of Markel for Elements 15[c.1] and 15[c.2], without explaining why it would have been obvious to a POSITA to combine those two embodiments. For at least this additional

reason, Masimo fails to meet its burden in presenting a *prima facie* case of obviousness.

According to claim element 15[c.1], the heart sensor includes "a first lead embedded in a first portion of the enclosure of the electronic device." EX-1001, claim 15. In its attempt to map to this feature, Masimo relies upon the embodiments described by Markel with respect to Markel's FIGS. 4 and 5, reproduced below. Petition, 66-68. Masimo alleges that since "Markel discloses an example of MCD (device) 400 in Fig. 4," and because "Markel discloses a first electrode 'placed on or molded into region 410*b*'," "Markel describes a first pad formed of conductive plastic embedded in a first portion of the enclosure." *Id*.

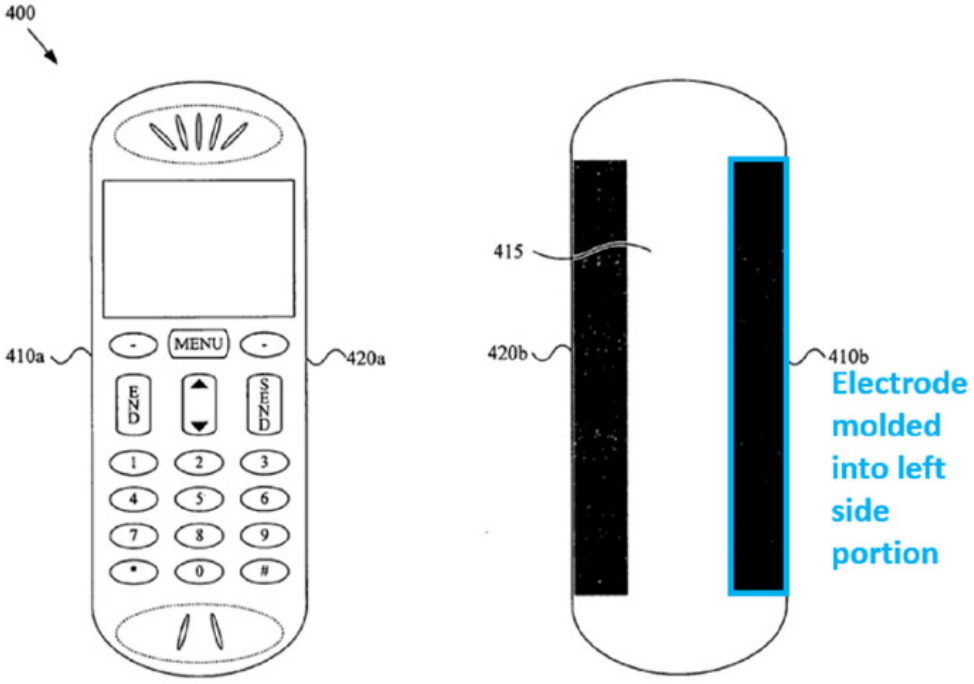


FIG. 4 of Markel (EX-1005), as presented in Petition at pg. 67.

Masimo continues to state that "[a]lternatively, Fig. 5 of Markel discloses 'a first electrode 510 positioned on a send button, and a second electrode disposed on the back 520 of the mobile communication device 500'," and concludes that "[b]oth of these electrodes are shown as being pad shaped." Petition, 67.

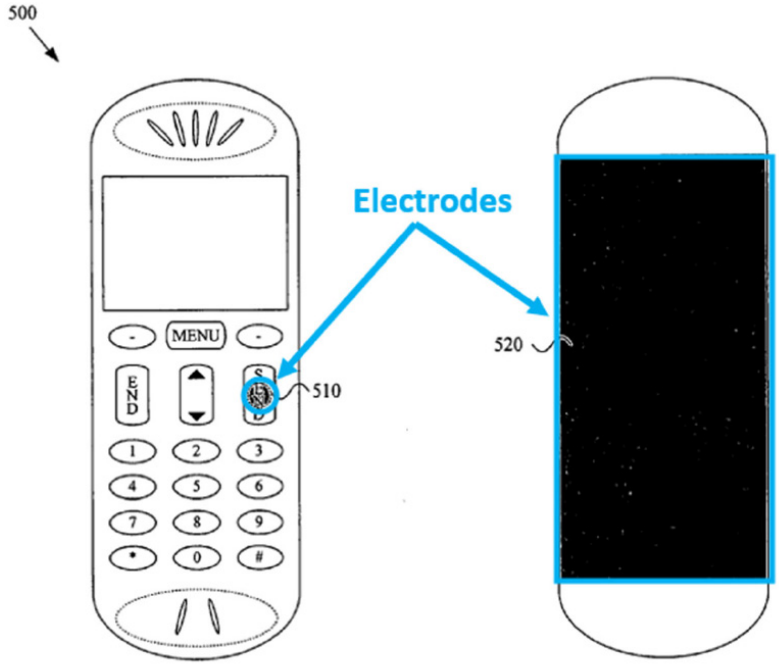


FIG. 5 of Markel (EX-1005), as presented in Petition at pg. 68.

The device shown in each of Markel's FIGS. 4 and 5 is a "cellular or portable telephone." *See* EX-1005, [0033], [0045]-[0046] ("the mobile communication device 100 may comprise characteristics of a cellular or portable telephone."), *id.* ("The mobile communication device 400 illustrated in FIG. 4."), *id.* ("The mobile communication device 500 illustrated in FIG. 5.").

However, with respect to claim Element 15[c.2], Masimo relies on Markel's disclosure with respect to FIG. 15. *See* Petition, 75-76 ("An electrode incorporated into the display is shown in Fig. 15."). Markel's FIG. 15 "illustrat[es] an exemplary computer display device 1500" (EX-1005, [0078]), but this device is not a cellular or portable telephone like the embodiments shown in Markel's FIGS. 4 and 5.

And Masimo fails to explain why a POSITA would have modified the telephone shown in Markel's FIGS. 4 and 5 based on disclosure provided with respect to the computer display device shown in Markel's FIG. 15. Furthermore, Masimo is silent as to whether that modification would have provided a successful result. For example, Masimo fails to explain how a POSITA would have, when considering a potential combination of these different embodiments, dealt with complications resulting from differences in size and shape of a telephone display in comparison to a computer display device.

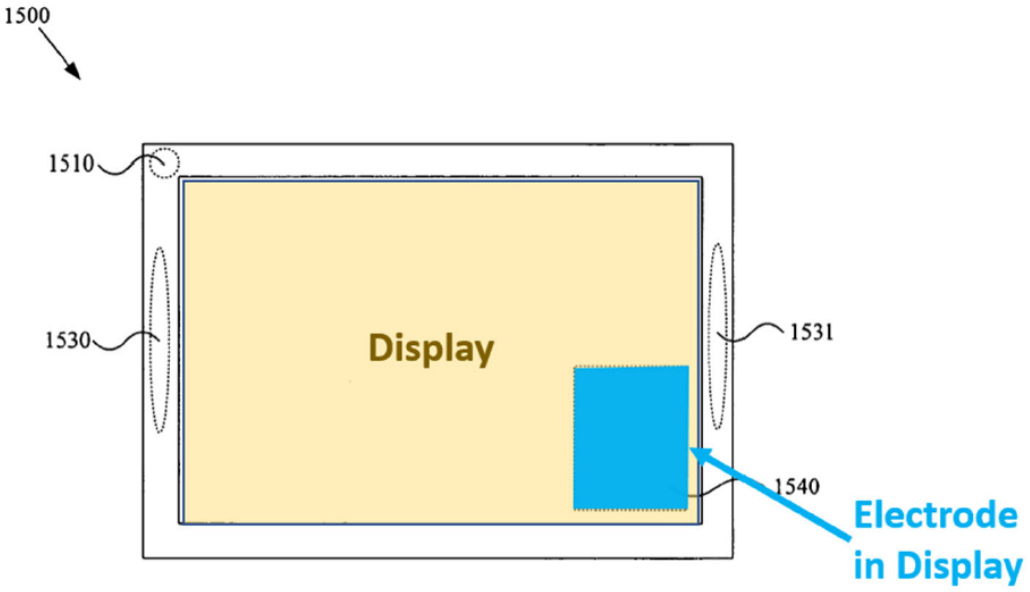


FIG. 15 of Markel (EX-1005), as presented in Petition, 76.

For at least these reasons, Masimo has failed to demonstrate a *prima facie* case of obviousness with respect to independent claim 15.

VI. CONCLUSION

For the foregoing reasons, Apple respectfully requests that the Board deny institution of Grounds 1 and 2 of Masimo's petition on the merits, and thereby deny institution of *inter partes* review of the '257 Patent.

Respectfully submitted,

Date: July 18, 2023

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CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Patent Owner's Preliminary Response totals 4,410, which is less than the 14,000 allowed under 37 CFR § 42.24(b)(1).

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(4), the undersigned certifies that on July 18, 2023, a complete and entire copy of this Patent Owner's Preliminary Response were provided via email, to the Petitioner by serving the email correspondence addresses of record as follows:

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