

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

MASIMO CORPORATION,
Patent Owner

Case IPR2024-00294
U.S. Patent 10,736,507

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

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APPLE-1003	Declaration of Dr. Thomas Kenny
APPLE-1004	RESERVED
APPLE-1005	U.S. Patent Application Pub. No. 2008/0004904 to Tran (“Tran”)
APPLE-1006	U.S. Patent No. 6,658,276 to Kianl et al. (“Kianl”)
APPLE-1007	Lorenzo T. D’Angelo, et al., A Sensor Network to iPhone Interface Separating Continuous and Sporadic Processes in Mobile Telemedicine, 33rd Annual International Conference of the IEEE EMBS Boston, Massachusetts USA, August 30 - September 3, 2011 (“D’Angelo”)
APPLE-1008	U.S. Patent No. 7,812,826 to Ording et al. (“Ording”)
APPLE-1009	U.S. Patent Application Pub. No. 2007/0093786 to Goldsmith et al. (“Goldsmith”)
APPLE-1010	U.S. Patent Application Pub. No. 2010/0324387 to Moon et al. (“Moon”)
APPLE-1011	Y. Mendelson, et al., A Wearable Reflectance Pulse Oximeter for Remote Physiological Monitoring, Proceedings of the 28th IEEE EMBS Annual International Conference New York City, USA, Aug 30-Sept 3, 2006
APPLE-1012	Declaration of June Munford
APPLE-1013	U.S. Patent No. 8,195,848 to Jones (“Jones”)

- APPLE-1014 Exemplary Infringement Claim Chart for the '507 patent from Apple Inc. v. PO Corporation et al., Case No. 1-22-cv-01378 (D. Del. Oct. 20, 2022)
- APPLE-1015 Exemplary Infringement Claim Chart for the '911 patent from Apple Inc. v. PO Corporation et al., Case No. 1-22-cv-01378 (D. Del. Oct. 20, 2022)
- APPLE-1016 – 1059 [RESERVED]
- APPLE-1060 U.S. District Courts—Combined Civil and Criminal Federal Court Management Statistics (Sep. 30, 2023) | United States Courts (uscourts.gov),
https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0630.2023.pdf
- APPLE-1061 Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Director’s Guidance”)
- APPLE-1062 Apple’s Complaint for Patent Infringement (Design), Apple Inc., v PO Corporation, et al., Case No. 1-22-cv-01377 (D. Del. Oct. 20, 2022)
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APPLE-1077 Median Time to Disposition in Cases Terminated After Hearing or Submission | United States Court of Appeals for the Federal Circuit (Sep. 30, 2023), available at: [MedDispTimeMERITS-Table-FY23.pdf \(uscourts.gov\)](https://www.uscourts.gov/sites/default/files/MedDispTimeMERITS-Table-FY23.pdf)

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APPLE-1092	U.S. Patent No. 7,598,878 to Goldreich (“Goldreich”)
APPLE-1093	U.S. Patent Application Pub. No. 2013/0069431 to Tseng et al. (“Tseng”)
APPLE-1094	J. Hudson, et al., Usability Testing of a Prototype Phone Oximeter with Healthcare Providers in High- and Low-Medical Resource Environments, 67 Anaesthesia 957-67 (2012) (“Hudson”)
APPLE-1095	Joseph A. Sankman, et al., Development of a Remote Pulse Oximeter, Bachelor’s thesis, University of Arizona (2010)
APPLE-1096	RESERVED

APPLE-1097	Walter Karlen, et al., Human-Centered Phone Oximeter Interface Design for the Operating Room, Proceedings of the International Conference on Health Informatics, Rome, Italy, SciTePress, 433-38 (2011)
APPLE-1098	Press Release, EDN, Nonin Medical Launches Low Power Xpod® Model 3012LP, OEM Pulse Oximeter Globally (May 3, 2011) available at https://www.edn.com/nonin-medical-launches-low-power-xpod-model-3012lp-oem-pulse-oximeter-globally/
APPLE-1099	Nonin, Xpod®: External EOM Pulse Oximeter (February 9, 2011) available at http://www.nonin.com/OEMSolutions/Xpod
APPLE-1100	U.S. Patent Application Pub. No. 2010/0146463 to Cho et al.
APPLE-1101	U.S. Patent No. 7,650,176 to Sarussi et al.
APPLE-1102	U.S. Patent No. 7,468,036 to Rulkov et al.
APPLE-1103	U.S. Patent Application Pub. No. 2009/0231960 to Hutcheson
APPLE-1104	U.S. Patent Application Pub. No. 2007/0173705 to Teller et al.
APPLE-1105	U.S. Patent Application Pub. No. 2007/0016053 to Lo et al.
APPLE-1106	Arpita Shah, PDA based ambulatory pulse oximeter, New Jersey Institute of Technology, May 2006 (“Shah”)
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APPLE-1112	U.S. Patent Application Pub. No. 2006/0211924 to Dalke et al. (“Dalke”) (incorporated by reference in APPLE-1084)
APPLE-1113	U.S. Patent Application Pub. No. 2011/0187245 to Pakula et al. (“Pakula”)
APPLE-1114	U.S. Patent Application Pub. No. 2003/0176815 to Baba et al. (“Baba”)
APPLE-1115	U.S. Patent Application Pub. No. 2009/0149299 to Tchao et al. (“Tchao”)
APPLE-1116	U.S. Patent Application Pub. No. 2011/0003665 to Burton et al. (“Burton”)
APPLE-1117	U.S. Patent No. 6,443,614 to Read (“Read”)
APPLE-1118	PCT Pub. No. WO2011/127446 to Soden et al. (“Soden”)
APPLE-1119	U.S. Patent Application Pub. No. 2010/0113950 to Lin et al. (“Lin”)
APPLE-1120	U.S. Patent No. 6,970,792 to Diab (“Diab”)
APPLE-1121	U.S. Patent No. 7,712,970 to Lee (“Lee”)
APPLE-1122	U.S. Patent No. 6,869,315 to Nakai et al. (“Nakai”)
APPLE-1123	U.S. Patent Application Pub. No. 2005/0265668 to Martin (“Martin”)
APPLE-1124	U.S. Patent Application Pub. No. 2004/0089570 to Chien et al. (“Chien”)
APPLE-1125	U.S. Patent Application Pub. No. 2011/0194234 to Kim et al. (“Kim”)

APPLE-1126	U.S. Patent Application Pub. No. 2011/0216482 to Moscovitch et al. (“Moscovitch”)
APPLE-1127	U.S. Patent No. 7,649,741 to Liu (“Liu”)
APPLE-1128	U.S. Patent Application Pub. No. 2008/0223892 to Hamilton (“Hamilton”)
APPLE-1129	U.S. Patent Application Pub. No. 20120122519 to Jochheim (“Jochheim”)
APPLE-1130	U.S. Patent Application Pub. No. 2010/0004522 to Varela (“Varela”)
APPLE-1131	U.S. Patent Application Pub. No. 2009/0171170 to Li et al. (“Li”)
APPLE-1132	Pomona Model 3231 Size B Aluminum Box With Cover BNC Male/Female specification (1999)
APPLE-1133	Pomona Model 3301 Size F Extruded Aluminum Box With Cover specification (1999)

LISTING OF SUBSTITUTE CLAIMS

Claim 21 (Substitute for claim 13)	
[21pre]	A computer-implemented method of informing a user of mobile measurement of oxygen saturation (“SpO2”), the computer-implemented method comprising:
[21a]	outputting, from an optical sensor of an SpO2 measurement system, one or more <u>analog</u> signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more <u>analog</u> signals responsive to an oxygen saturation of said tissue; and
[21b]	via a processing board of the SpO2 measurement system, the processing board in data communication with the optical sensor and a <u>smartphone</u> mobile computing device including a <u>touch-sensitive smartphone</u> display:
[21c]	receiving <u>through a wired connection</u> said one or more <u>analog</u> signals from the optical sensor;

[21d]	processing said one or more <u>analog</u> signals to generate the SpO2 measurement values <u>and heart rate</u> ; and
[21e]	<u>wirelessly</u> outputting the SPO2 measurement values <u>and heart rate</u> to the <u>smartphone</u> mobile computing device; and
[21f]	via an application configured to execute commands on the <u>smartphone</u> mobile computing device:
[21g]	generating a graphical user interface having a plurality of display portions <u>on the touch-sensitive smartphone display</u> ;
[21h]	displaying, in at least one portion of the plurality of display portions <u>at one or more times</u> , a representation of a physiological parameter of a plurality of physiological parameters comprising the SpO2 measurement values;
[21i]	<u>displaying, in at least one portion of the plurality of display portions at one or more times, a graph of a history of the SpO2 measurement values</u> ;

[21j]	<u>displaying, in at least one portion of the plurality of display portions at one or more times, a graph of a history of the heart rate;</u>
[21k]	<u>displaying, in at least one portion of the plurality of display portions at one or more times, a graphical representation of a heart; and</u>
[21l]	displaying, in a different portion of the plurality of portions, a plurality of user inputs configured to allow the user to <u>use the touch-sensitive smartphone display to</u> interact with at least one of the plurality of display portions or the application;
[21m]	<u>wherein the computer-implemented method is configurable to authenticate user data access by using at least one of fingerprint, facial, and voice recognition technologies;</u>
[21n]	<u>the processing board surrounded within a protective assembly comprising upper and lower shells and a rounded rectangular enclosure forming a cavity with upper and lower openings, the openings having an inner ledge and a perimeter lip sized and configured to receive the upper and lower shells to fill</u>

	<u>the openings such that the perimeter lip surrounds at least a portion of perimeter sides of the upper and lower shells;</u>
[21o]	<u>the light from the light source comprises at least red and infrared light; and</u>
[21p]	<u>the SpO2 measurement system is configured to be portable by including the sensor and processing board together, wirelessly connectable to the smartphone mobile computing device for display of physiological data.</u>
Claim 22 (Substitute for claim 14)	
[22pre]	The mobile pulse oximetry system of claim [[13]] <u>21</u> , further comprising, via the application:
[22a]	performing a trend analysis on received SpO ₂ measurement values; and
[22b]	displaying results of the trend analysis in at least one portion of the plurality of display portions;

[22c]	<u>wherein the processing said one or more analog signals comprises applying an advanced signal processing algorithm with data filtering.</u>
Claim 23 (Substitute for claim 17)	
[23a]	The computer-implemented method of claim [[13]] <u>21</u> , further comprising, via the application, updating the representation of the physiological parameter to comprise one or more of a plurality of graphical representations of the SpO2 measurement values, the plurality of graphical representations comprising at least one of bar graphs or charts;
[23b]	<u>the rounded rectangular enclosure comprising, on a first side, a first transition from the enclosure to a tapered flexible support member, and on a second side opposite the first side, a second transition from the enclosure to a tapered flexible support member;</u>
[23c]	<u>wherein the sensor and processing board are provided together with a wrist-mounted device.</u>

Claim 24 (Substitute for claim 19)

[24]	<p>The computer-implemented method of claim [[13]]<u>21</u>, <u>wherein the protective assembly is configured to protect sensitive</u> <u>circuitry of the processing board from water damage</u> further comprising wirelessly transmitting the SpO2 measurement values from the SpO2 measurement system to the mobile computing device.</p>
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LISTING OF GROUNDS

Ground	Claim(s)	35 U.S.C. § 103
RMTA 1A	21, 23-24	Poeze (APPLE-1110) in view of Kianl (APPLE-1006), Baba (APPLE-1114), and Pakula (APPLE-1113)
RMTA 1B	22	Poeze in view of Kianl , Baba , Pakula , and Moon (APPLE-1010)
RMTA 1C	22	Poeze in view of Kianl , Baba , Pakula , and Diab (APPLE-1120)
RMTA 1D	23-24	Poeze in view of Kianl , Baba , Pakula , and Teller (APPLE-1104)
RMTA 2A	21, 23-24	Poeze in view of Kianl , Baba , Pakula , and Lin (APPLE-1119)
RMTA 2B	22	Poeze in view of Kianl , Baba , Pakula , Lin , and Moon
RMTA 2C	22	Poeze in view of Kianl , Baba , Pakula , Lin , and Diab
RMTA 2D	23-24	Poeze in view of Kianl , Baba , Pakula , Lin , and Teller
RMTA 3A	21, 23-24	Poeze in view of Kianl , Baba , and Soden (APPLE-1118)
RMTA 3B	22	Poeze in view of Kianl , Baba , Soden , and Moon
RMTA 3C	22	Poeze in view of Kianl , Baba , Soden , and Diab

Ground	Claim(s)	35 U.S.C. § 103
RMTA 3D	23-24	Poeze in view of Kianl, Baba, Soden, and Teller
RMTA 4A	21, 23-24	Poeze in view of Kianl, Baba, Soden, and Lin
RMTA 4B	22	Poeze in view of Kianl, Baba, Soden, Lin, and Moon
RMTA 4C	22	Poeze in view of Kianl, Baba, Soden, Lin, and Diab
RMTA 4D	23-24	Poeze in view of Kianl, Baba, Soden, Lin, and Teller

Petitioner, Apple Inc., respectfully requests that Patent Owner (“PO”) Masimo’s Revised Motion to Amend (RMTA) be denied. Not only do the RMTA claims fail to comply with written description and definiteness requirements of § 112, they are rendered obvious by the prior art.

I. SUB. CLAIMS 21-24 LACK WRITTEN DESCRIPTION SUPPORT

A. The RMTA fails to demonstrate support for any of the sub. claims

PO fails to meet its burden under 37 CFR §42.121 to demonstrate support in the original patent disclosure for each proposed substitute claim. Rather, PO presents “only a claim chart with bare citations, leaving it to the panel to discern how the cited material supports the claim limitations.” *NeuroDerm Ltd. v. AbbVie Inc.*, PGR2022-00040, Paper 77 at 15 (PTAB Oct. 31, 2023). PO is obligated “to explain how the material cited in the claim chart supports the claims” and its “failure to explain the citations *constitutes a fatal error.*” *Id.*, *see also id.*, 19 (all emphasis added unless otherwise noted). Here, PO identifies 16 bullet points of amendments to claim 21 alone, yet provides no guidance as to which bare citations in its chart support which claim elements. RMTA, 3-5, 12.

B. Element [21n] Lacks Written Description Support

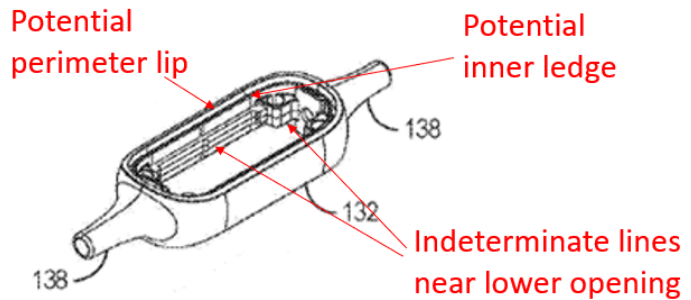
It is PO’s burden to demonstrate that “*the disclosure of the application relied upon*” demonstrates “that the inventor had possession of the claimed subject matter” based on “the specification itself.” *Ariad Pharms., Inc. v. Eli Lilly and Co.*,

598 F.3d 1336, 1351-52 (Fed. Cir. 2010) (en banc). PO is not entitled to claim “subject matter which is not disclosed, but would be obvious over what is expressly disclosed.” *In re Huston*, 308 F.3d 1267 (Fed. Cir. 2002). As such, the original disclosure must “actually or inherently disclose the claim element.” *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306-07 (Fed. Cir. 2008).

Here, element [21n] recites in part an “enclosure forming a cavity with upper and lower openings, *the openings having an inner ledge and a perimeter lip sized and configured to receive the upper and lower shells.*” That each of the upper and lower openings is required to have “an inner ledge and a perimeter lip sized and configured to receive” a respective shell is unsupported by the specification.

As an initial matter, the written portion of the original disclosure includes no mention of “an inner ledge,” “a perimeter lip” or a ledge or lip of any sort. *See* EX2045. The only written discussion of how the shells attach to the enclosure is that “the upper and lower shells 135, 131 can be formed to fit together with the enclosure 132 in a substantially water-tight manner.” *Id.*, [0042]-[0043], [0038]. The RMTA does not even identify what portions of the original disclosure specifically support element [21n]; thus, Petitioner is left to assume that PO relies on FIGs. 1A-1C as support for this element. This is insufficient. Moreover, only FIG. 1C shows any portion of the inside of the enclosure 132. While enclosure 132 in FIG. 1C (partial, next page) arguably (though not definitively) shows features

that may be an inner ledge and perimeter lip for the upper opening, there is no depiction of the **lower** opening including “an inner ledge” or “a perimeter lip” as recited by

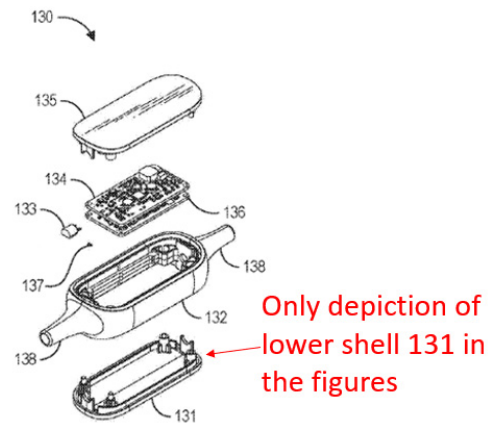


EX2045, FIG. 1C (partial)

element [21n]. Rather, FIG. 1C shows various indeterminate lines that suggest internal structures, but clearly do not depict the “inner ledge” and “perimeter lip” for the lower opening recited by [21n].

Even if PO were to point to lines shown near the lower opening of enclosure 132 and argue that they depict “an inner ledge and a perimeter lip,” there is no description or depiction at all of any alleged **lower** inner ledge or perimeter lip being “sized and configured to receive the...lower shell[.]” Random lines positioned near the lower opening of enclosure 132 that are never described do not provide the “reasonable clarity” required to support element [21n]. *Nuvo Pharms. v. Dr. Reddy's Labs.*, 923 F.3d 1368, 1376--77 (Fed. Cir. 2019). Furthermore, while multiple figures (e.g., FIG. 1A) of the original disclosure appear to show that the upper opening of the enclosure 132 “surrounds at least a portion of a perimeter sides of the upper...shell[.]” as recited in element [21n], no figure depicts the lower opening of enclosure 132 (or any other enclosure) “surround[ing] at least a portion of a perimeter sides of the...lower shell[.]” Only FIG. 1C shows lower shell 131 at

all and, in that figure, lower shell 131 is depicted in a detached “exploded view” (right) that fails to illustrate the claimed features. EX2045, [0013]. Accordingly, Element [21n] lacks written description support.



EX2045, FIG. 1C (partial)

C. Element [23b] Lacks Written Description Support

PO cannot demonstrate that it “possessed the invention...by picking and choosing claim elements from different embodiments that are never linked together in the specification.” *Flash-Control, LLC v. Intel Corp.*, 2021 U.S. App. LEXIS 20790 at **12 (Fed. Cir. July 14, 2021). As such, element [23b] lacks written description support because it combines elements from two different embodiments that are never combined in the specification. Specifically, claim 23 depends from claim 21 which requires “*wirelessly outputting*” values from the processing board to the mobile computing device (“MCD”). Yet, element [23b] requires a first *and second* “transition from the enclosure to a tapered flexible support member”—a configuration drawn from embodiments in which the processing board has a *wired* connection to the MCD. The only support for the claimed “transition[s]” appears to be bend relief portions 138, which are described as “providing a gradual *transition* from the *flexible* cables to substantially rigid connection points” and appear on

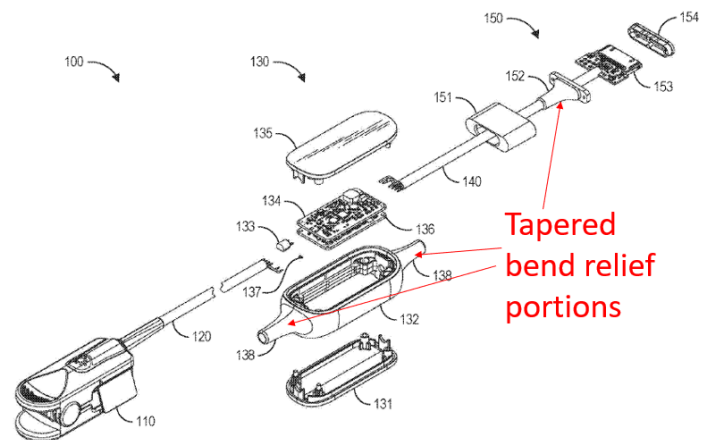
opposite sides of the enclosure 132, as claimed. EX2045, [0041], FIG. 1C. Only embodiments in which the processing board communicates with the MCD through a **wired connection** (cable 140) include two of these “transition[s].” *Id.*

However, the embodiment depicted in FIGs. 1A-1C in which the bend relief portion 138 provides a connection to the cable 140 is **distinct from** embodiments in which the processing board communicates **wirelessly** with the MCD. Specifically, “[s]martphone 160 can be coupled to the processing module 130 **by a second cable 140** and connection port 150, **in some embodiments**” (e.g., the embodiment of FIG. 1C), “and in **other embodiments** can be configured to **wirelessly transmit** the parameter data to the smartphone 160.” *Id.*, [0027]. The only function of bend relief portion 138 is to provide a “transition” from the enclosure 132 to the cable 140. *Id.*, [0041]. There is simply no support for a second bend relief portion 138 (“transition”) in embodiments in which the cable 140 is replaced with a wireless connection. This fault is fatal. *Flash-Control*, 2021 U.S. App. LEXIS 20790 at 12.

Beyond that, there is no support for the first or second “tapered **flexible** support member.” The written description never describes any component as being “tapered” while the only tapered elements depicted in the figures appear to be bend relief portions 138 and 152 (next page). EX2045, FIG. 1C, [0041]. There is no description of the bend relief portions 138 being flexible; rather they are described as “**prevent[ing]...flexing.**” *Id.* Only the cables 120, 140 are described as

“flexible” yet the cables are neither
“tapered” nor “support member[s].” *Id.*

Finally, element [23b] recites a first
and second “*transition from* the
enclosure *to* a tapered flexible support
member.” If PO relies on the bend



relief portions 138 as support for the “tapered flexible support member[s]” (which
is unclear from the RMTA), there is no support for the claimed “transition” as it is
the bend relief portions 138 themselves that are described as “providing a gradual
transition” *Id.* Thus, [23b] lacks written description support.

D. Element [23c] Lacks Written Description Support

Element [23c] recites “the sensor and processing board are provided together
with a *wrist-mounted* device.” The only mention of a wrist-mounted device in the
original disclosure is the recitation of a “wristwatch” identified as an alternative
implementation to “a smartphone” for the MCD. EX2045, [0023]. However, claim
23 depends from claim 21 which specifies that the MCD is “a smartphone mobile
computing device.” The specification has no embodiments having two different
MCDs. As such, there is no support in the original disclosure for an embodiment in
which the MCD is a “smartphone” (as recited by claim 21) and “the sensor and
processing board are provided together with a *wrist-mounted* device.”

II. SUB. CLAIMS 21 AND 22 ARE INDEFINITE

The claims, when read in light of the specification and the prosecution history, must provide “objective boundaries” for those of skill in the art. *Interval Licensing LLC v. AOL, INC.*, 766 F. 3d 1364, 1371 (Fed. Cir. 2014). Although absolute or mathematical precision is not required, a patentee must identify “some standard for measuring the scope of the phrase.” *Id.* at 1370-71.

A. Element [21p] is Indefinite

Element 21p seeks to add that the “SpO2 measurement is configured to be portable by including the *sensor and processing board together, wirelessly connectable to the smartphone mobile computing device* for display of physiological data.” RMTA at 5. This limitation is indefinite under § 112 for two independent reasons. First, the specification and claims provide no indication to a POSITA as to the scope of what it means to provide the sensor and processing board “together.” Second, the additional limitation is irreconcilably vague as to which components are “wirelessly connectable” to the smartphone.

The disclosures that PO points to for supposed support of amendment 21p expressly state that the processing board **134**, is “house [*sic*] in a portion of the cable such that it is *not* directly coupled to the sensor or the smartphone connector.” *See e.g.*, Ex. 2045, [0006], [0038]. Thus, by now attempting to amend the claims such that the SpO2’s sensor and processing board are included

“together,” PO has inserted ambiguity and vagueness into the claim that is directly contrary to the disclosure in the specification. Given the contradiction between the amendment’s language and the specification’s disclosure, a POSITA is not able to discern the meets and bounds of providing the sensor and processing board “together.” Does this mean that the sensor and processing board are part of a kit that has multiple independent components? Does it mean that the sensor and the processing board are contained in the same housing/structure? Simply put, a POSITA is unable to discern the limits of the claim to know whether a particular product falls inside or outside the scope of the claims.

Separately, the amendment fails to provide sufficient clarity for a POSITA to determine whether it requires each of the sensor and the processing board to be wirelessly connected to the smartphone, or if it only requires that one of the two is wirelessly connected. Thus, element 21p does not provide “reasonable certainty” as to claim scope, which causes this proposed element to fail under § 112’s definiteness requirement. *Nautilus*, 572 U.S. at 901, 910; *see also Interval Licensing*, 766 F. 3d at 1371.

B. Element [22c] is Indefinite

PO seeks to add element 22, which requires “applying an *advanced signal processing algorithm* with data filtering.” RMTA at 5. This amendment’s recitation of “*advanced* signal processing” creates an incurable vagueness.

The Original Disclosure describes “advanced signal processing techniques” (at [0032]) to include “parallel engines and adaptive filters.” It goes on to state that in some embodiments, the “processing module 120 can employ Signal Extraction Technology, or Masimo SET®, using parallel signal processing engines” *Id.* Despite this disclosure, nowhere does the Original Disclosure establish what differentiates “an *advanced* signal processing algorithm,” from other types of signal processing. As such, it is impossible for a POSITA to determine the “objective boundaries” of this proposed claim. *Interval Licensing*, 766 F. 3d at 1371. This is true even if you consider the addition of “with data filtering.” As such, claim 22 fails to meet § 112’s definiteness requirement.

III. MASIMO’S CLAIMS FAIL TO OVERCOME THE PRIOR ART

Masimo’s sub. claims fail to overcome the prior art as provided in the *Listing of Grounds* (*supra*, pp. xvi-xvii) and discussed in the sections below.

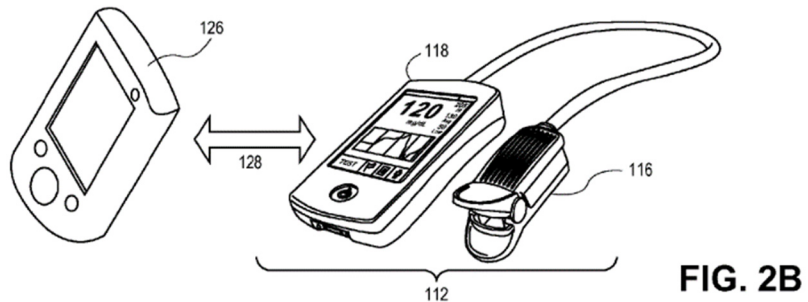
To the extent that claim 21 is interpreted such that the term “mobile measurement of oxygen saturation (‘SpO₂’)” is interpreted to require active reduction and/or correction of motion artifacts from user motion, Moon would have been properly added to all of the Grounds in the same manner, to achieve the same benefits, as discussed in the Petition. Pet., §III.J; APPLE-1003, ¶¶212-244.

**A. RMTA Ground 1A: The Poeze-Kianl-Baba-Pakula Combination
Renders Obvious Sub. Claims 21, 23-24**

1. Overview of Poeze

Poeze discloses a “personal health organizer” implemented as “an executable program on an operating system of a device such as a mobile phone” for use with a “pulse oximeter.” APPLE-1110, [0009]-[0010], [0029], [0034]. The system includes “a finger clip sensor 116 connected to a monitor 118 via a cable.”

Id., [0031]. The monitor
“receiv[es] signal data from
the sensor 116 [and]
process[es] the signal data



to determine one or more output measurement values” such as “SpO2”. *Id.*, [0031], [0029]. The monitor outputs the determined physiological data to mobile phone 126 via a wireless “communications link 128.” *Id.*, [0034]-[0035]. The mobile phone “displays trended data for a user in a variety of graphical formats” including “continuous or spot readings of measurable parameters.” *Id.*, [0066].

2. Overview of Baba

Baba describes “a wristwatch type physical activity measurement apparatus.” APPLE-1114, [0052]. Baba’s displayed interface includes a “***heart icon*** 400 [that] changes according to the heart rate” so that “the user can determine the load on the heart by simply glancing at the heart icon 400.” *Id.*, [0096]-[0097].

3. Overview of Pakula

Pakula describes “[i]mproved housings for electronic devices” having protective sides “to dissipate impact forces and thus reduce damage to the electronic device housing” and to “support and protect” internal components. EX1113, Abst., [0048]-[0049]. As shown in the figures, various embodiments “include an outer periphery member” surrounding “front and back covers.” *Id.*, [0053]. In several embodiments, the housing includes top and bottom covers that abut a protective side bumper such that the covers are “recessed within the outer periphery member.” *Id.*, [0114]-[0117], [0092].

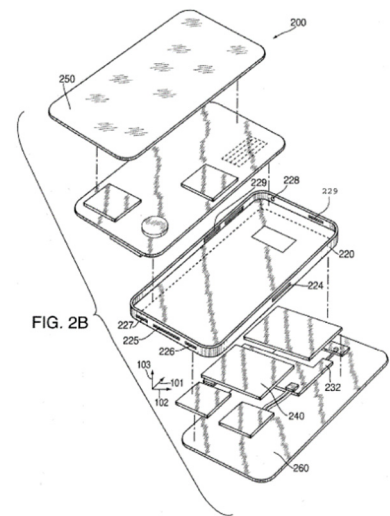
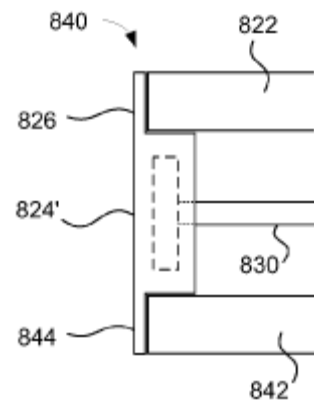


FIG. 8D

4. Combination of Poeze, Kianl, Baba, and Pakula

Kianl is summarized in the Petition. Pet., §III.C. A POSITA would have been motivated to modify Poeze’s mobile phone to display a user interface (UI) that includes graphs of histories of SpO₂ and heart rate measurement values and control icons (based on Kianl) for reasons similar to those discussed for the Mendelson-Kianl combination in the Petition (Pet., §III.C.2; APPLE-1003, ¶¶100-109) including to (1) allow health practitioners to readily identify abnormal patterns, conditions, and other health concerns based on SpO₂ and heart rate history

data; (2) allow users to easily switch between various data views; (3) allow healthcare providers and other users to more easily mentally process SpO₂ and heart rate data; and (4) improve the overall usability of the system. APPLE-1109, ¶¶28-36. Inclusion of Kianl's various on-screen control buttons would have also allowed users to easily access various features of the resulting healthcare software by selecting such buttons using Poeze's touchscreen. *Id.*, ¶33. Finally, Poeze expressly describes that the mobile phone health tracking software receives "input by a user" via touchscreen and displays "visualization of health data tracking or trending" but does not include examples in the figures. APPLE-1110, [0043], [0062], [0065]-[0066]. Kianl provides various examples of input icons and health data trend displays that were known to a POSITA that provide such details absent from Poeze. APPLE-1109, ¶¶34-35.

Application of Baba to Poeze to display a heart icon that changes "according to whether the user's heart rate is within, above, or below the allowable heart rate range" in the UI would have beneficially allowed users to easily "determine the load on the heart by simply glancing at the heart icon." APPLE-1114, [0096]-[0097]; APPLE-1109, ¶¶37-41. Displaying a heart icon also would have readily and intuitively indicated to the user that the displayed measurement values are heart rate values and that the heart rate sensor is active. APPLE-1109, ¶¶38-39; APPLE-1117, 2:27-30; APPLE-1116, [0131], FIG. 88a.

Multiple reasons would have prompted a POSITA to modify Poeze's system based on Pakula to include an improved electronic device housing for mounting and protecting the display and internal electronics of Poeze's monitor 118. Such an implementation would have "dissipate[d] impact forces and thus reduce[d] damage to the electronic device housing" and "protect[ed] the components from damage during use or when dropped." APPLE-1113, [0007], [0071], [0046]-[0047], [0121]; APPLE-1109, ¶¶42-49. Pakula's housing allows for "robustly attaching" components to "support and protect" such components. APPLE-1113, [0048]-[0049]. This modification "can provide a variety of attributes to the electronic device including...structural, functional, [and] cosmetic" improvements. *Id.*, [0054], [0058], [0084], [0097]. The flush edges and curves of Pakula's housing "prevent edges from engaging other surfaces." *Id.*, [0071]. Pakula's housing also beneficially "provide[s] attachment points for the various layers placed within the electronic devices" to allow the electronic components described by Poeze to be securely mounted within the resulting monitor device. *Id.*, [0060], [0064], [0067], [0089]; APPLE-1109, ¶43. Further, Pakula's teachings are applicable to "any suitable type of electronic device having a display" and therefore are directly applicable for implementing Poeze's monitor 18. APPLE-1113, [0061]; APPLE-1109, ¶48. Poeze's housing provides "reduce[d]... overall weight, size or both" and "resistance to all types of deformation" compared to prior electronic devices.

APPLE-1113, [0085]. The front and back covers can “retain components within” the device while “provid[ing] access to one or more internal components” to allow for easy “servicing or replacing electronic device components.” *Id.*, [0090]-[0091], [0064]; APPLE-1109, ¶47.

5. Application to Claims 21, 23-24

[21pre]

Poeze discloses “methods...for obtaining and analyzing medical data” including “SpO₂” and “provide[s] visualization of health data tracking or trending.” APPLE-1110, [0027]-[0029], [0114], [0066], [0058] (“medical data display module”); *see also* APPLE-1006, 11:6-31, FIG. 10. The system includes “a mobile computing device”/“mobile phone” to “provide the patient with mobility and provide the caregiver the option of including the monitoring device when transporting patients” and can measure “movement of the user.” APPLE-1110, [0028], [0034], [0006], [0013], [0052], [0082]; APPLE-1109, ¶¶51-52.

[21a]

Poeze discloses “finger clip sensor 116” that sends “signal data” to monitor 118. APPLE-1110, [0031], [0093]. “[S]ensor 116 includes an emitter 504” that emits “optical radiation transmitted towards measurement site” and “detectors 506 [that] capture and measure light transmitted from the emitter 504 that has been attenuated or reflected from the tissue in the measurement site.” *Id.*, [0106],

[0118]. The “output of the detectors 506...is responsive to desired physiological parameters” including “oxygen saturation (SpO2).” *Id.*, [0120], [0114]; FIG. 8. Poeze’s system includes “front-end interface [that] adapt[s] a signal 524 received from one or more of the detectors 506 into a form that can be processed by the monitor 118” and “can have its components assembled in the sensor 116, in the monitor 118, [or] in connecting cabling.” *Id.* As such, in various embodiments, the sensor 116 alone, or a combination of the sensor 116 and front-end interface 508 provides the claimed optical sensor. APPLE-1109, ¶¶53-56. An “analog to digital converter[]” (ADC) receives the output of the front-end interface 508 and “provide[s] one or more outputs...for processing by the signal processor 510 of the monitor 118” and therefore the signals output by the sensor 116 and front-end interface 508 are analog. APPLE-1110, [0122]-[0124] (describing ADCs “in the monitor 118”); APPLE-1111, [0053], [0267]; APPLE-1109, ¶56.

[21b]

Poeze’s monitor 118 “receiv[es] signal data from the sensor 116 [and] process[es] the signal data to determine one or more output measurement values” such as “SpO2” saturation. APPLE-1110, [0031], [0029]. Monitor 118 includes signal processor 510 having “processing logic that determines measurements for desired

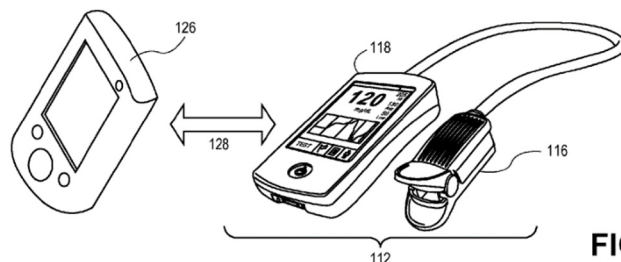
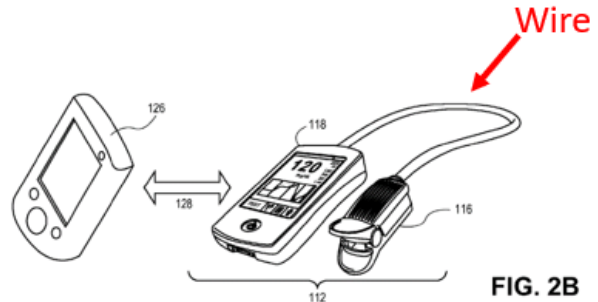


FIG. 2B

analytes.” *Id.*, [0126]. As shown in FIG. 2B (right), monitor 118 is in data communication with sensor 116 and computing device 126. *Id.*, [0031], [0034]; APPLE-1109, ¶¶57-60. Computing device 126 is smartphone such as an “iPhone” or “Blackberry” and has “a touch screen.” *Id.*, [0034], [0040]-[0043]. To the extent that the internal components of the monitor 118 (including the ADC and signal processor 510) are not expressly described as being a “processing board” it would have been obvious to mount these processing components on a board (e.g., PCB) as was well-known in the art. For example, Pakula describes that various internal computing components of the resulting device “can be electrically coupled using one or more of a **PCB**...” APPLE-1113, [0066], [0069]-[0070] (“the internal platform can be formed by a printed circuit board.”). For example “internal components of the [resulting] electronic device” can be implemented using “a circuit board” that includes various “chips.” *Id.*, [0085]-[0086]. Implementing at least the ADC and signal processor 510 of Poeze as components of a circuit board (along with front-end interface 508 in some embodiments) based on Pakula’s suggestions would have beneficially allowed the components to be in electrical communication in a reliable, well-known manner while securing the components within the assembly to provide the benefits discussed in §III.A.4, *supra*. APPLE-1109, ¶59; APPLE-1092 11:6-20 (corroborating mounting a processor and ADC for an SpO2 measuring device on the same PCB); APPLE-1118, [81].

[21c]

Poeze's monitor 118 "receiv[es] signal data from the sensor 116" via a "wired" connection. APPLE-1110, [0031], [0029], [0121], FIGs. 2B, 8. As discussed with respect to [21b], *supra*, the signals are analog. APPLE-1109, ¶61.



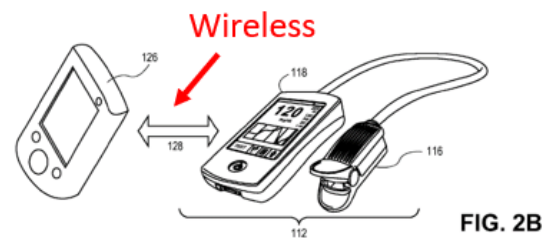
[21d]

[T]he monitor 118 can advantageously includes electronic processing, signal processing, and data storage devices capable of receiving signal data from the sensor 116, [and] *processing the signal data to determine* one or more output measurement values *indicative of one or more physiological parameters* of a monitored patient" including "oxygen saturation (SpO₂).” APPLE-1110, [0031], [0029], [0114]. Poeze further describes tracking "the user's pulse rate." *Id.*, [0052]. To the extent that Poeze does not expressly describe that the monitor determines heart rate using signals from the sensor 116, this is made express by Dalke and Poeze-040, which are both incorporated by reference in Poeze. *Id.*, [0029], [0107]. For example, Poeze states that Poeze-040 provides "[e]xample portable non-invasive monitoring devices" and Poeze-040 describes that its monitor measures oxygen saturation and "*pulse rate.*" *Id.*; APPLE-1111, [0006]. Similarly, Poeze discloses that its monitor can be "a pulse oximeter" and Dalke explains that "*pulse*

oximetry... utilizes a noninvasive sensor to measure *oxygen saturation (SpO2)* *and pulse rate*” and that its monitor uses signals from light detectors of its sensor to “determine[] measurements for SPO2, pulse rate.” APPLE-1110, [0029], [0009], APPLE-1112, [0005]-[0006], [0054]-[0058]; APPLE-1109, ¶¶62-64. Alternatively, it would have been obvious to modify Poeze based on Dalke and/or Poeze-040 to determine heart rate to beneficially provide additional physiological parameter information for use in determining overall health/fitness. APPLE-1109, ¶65.

[21e]

The sensor 116 and monitor 118 are part of “health data collection device 112” that communicates with computing device 126 (smartphone) via “a wired *or wireless*” communications link 128. APPLE-1110, [0031],



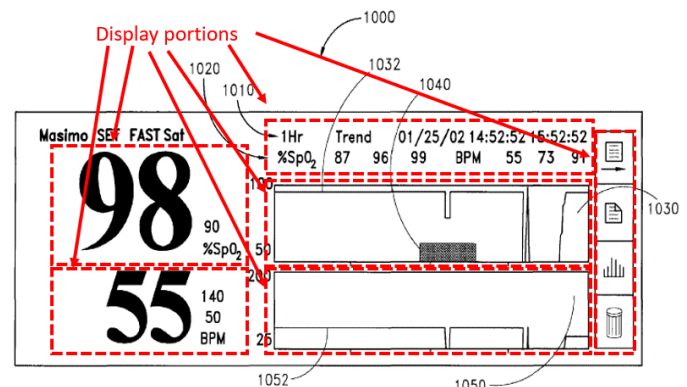
[0034]-[0035]. The smartphone includes “a personal health organizer software module” having “medical data analysis module 326” that “receive[s] medical or physiological data from the health data collection device 112.” *Id.*, [0034], [0058]-[0059] (“receive the measurement outputs from the monitor 118”); APPLE-1109, ¶66. As discussed at [21d], *supra*, the physiological parameters include SpO2 and heart rate.

[21f]

Poeze's "personal health organizer software module" is an application that executes commands on the smartphone 126 to perform the disclosed processes. APPLE-1110, [0034], [0039], [0058], [0067]; APPLE-1109, ¶67.

[21g]

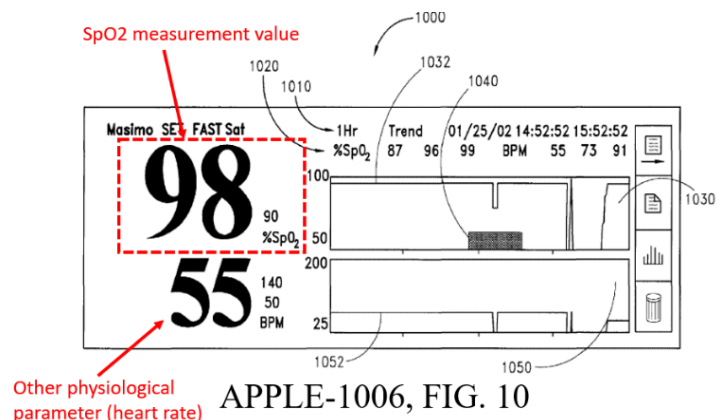
Poeze's smartphone has a touchscreen display for displaying "visualization of health data tracking or trending." APPLE-1110, [0040], [0043], [0047], [0062], [0065]-[0066], FIG. 4. As discussed in §III.A.4, *supra*, Kianl demonstrates that the graphical user interface (GUI) of the resulting smartphone of the predictable combination has a plurality of display portions. APPLE-1006, 11:6-31, FIG. 10. APPLE-1109, ¶¶68-62.



APPLE-1006, FIG. 10

[21h]

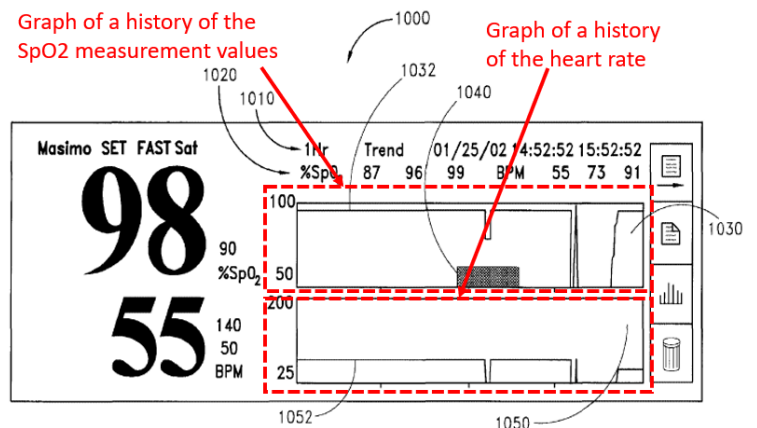
The GUI displays current and "minimum, average, and maximum SpO2 and pulse rate measurements." APPLE-1006, 11:6-31, FIG. 10. APPLE-1109, ¶73.



APPLE-1006, FIG. 10

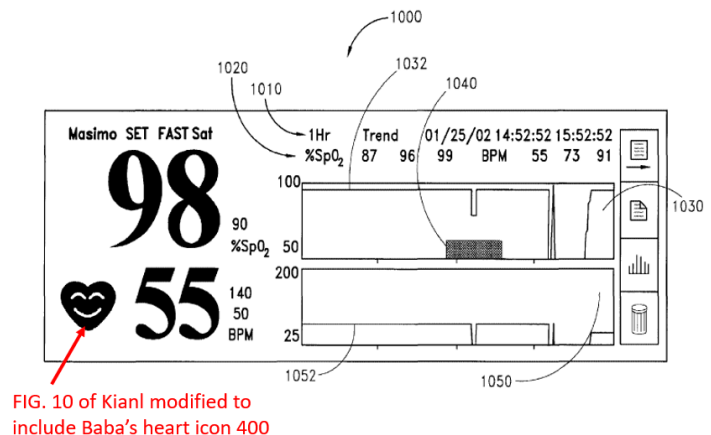
[21i]-[21j]

The GUI includes “oxygen saturation trend graph 1030 show[ing] the SpO2 measurements displayed versus time” and “pulse rate trend graph 1050 show[ing] the pulse rate measurements displayed versus time.” APPLE-1006, 11:6-23; APPLE-1110, [0051] (“...view full screen trended data (e.g. readings tracked over a period of time)”), [0062]. The displayed trend graphs are a “history” of SpO2 and heart rate, respectively, because the GUI shows “the starting date, starting time and end time of the data set that is displayed on the screen.” *Id.*, 11:6-23, 12:18-26 (“histogram”); APPLE-1110, [0054] (“device history log”), [0072]; APPLE-1109, ¶¶74-76.



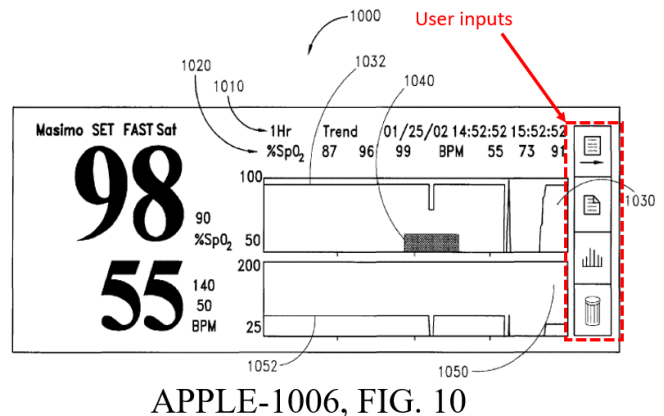
[21k]

Baba demonstrates that the GUI of the resulting system includes a “heart icon 400 [that] changes according to the heart rate” so that “the user can determine the load on the heart by simply glancing at the heart icon.” APPLE-1114, [0096]-[0097]; APPLE-1109, ¶¶77-78.



[21l]

As discussed above, the smartphone of the resulting combination receives user input using Poeze's touchscreen. APPLE-1110, [0040], [0043], [0047]. Kianl demonstrates that the GUI includes a plurality of user inputs that allow user interaction with the application. APPLE-1109, ¶79. Specifically, the GUI includes “soft key icons” including “display view icons 810, menu icons 820, category icons 830, [] parameter icons 840,” and “trend-related icons 870-890.” APPLE-1006, 9:44-10:27, FIGs. 8A-10.

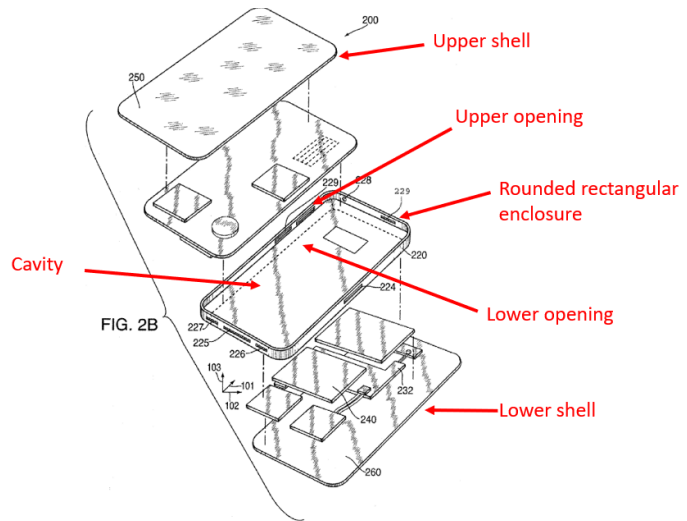


[21m]

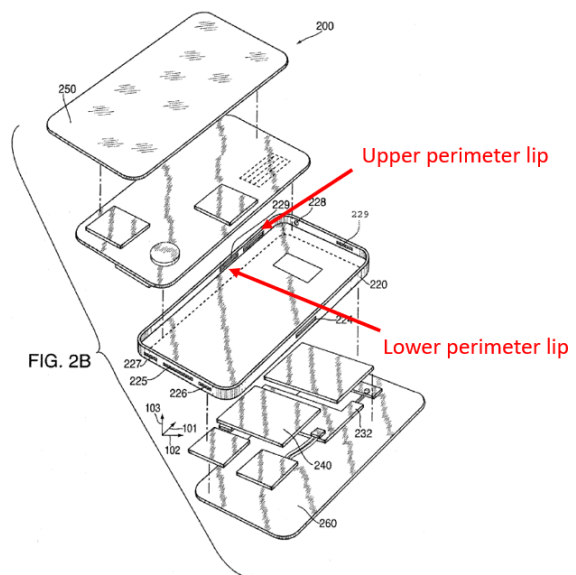
Poeze discloses that the smartphone 126 “store[s] patient information’ and “include[s] a biometric identification module (such as a vein pattern or *finger print scanner*) 246 to...provide security for information stored.” APPLE-1110, [0040], [0048], [0055] (voice recognition), [0071], [0092] (describing “biometric identification” including facial and fingerprint recognition to provide “security”); APPLE-1109, ¶80.

[21n]

Pakula discloses a protective assembly for Poeze's monitor 118 in the resulting combination. APPLE-1109, ¶¶81-89, 27. Pakula's protective assembly "protect[s] the components from damage during use or when dropped." APPLE-1113, [0071], Abst. The housing includes "front cover assembly 250" (upper shell), "back cover assembly 260" (lower shell)," and "[o]uter periphery member 220 [that] surround[s] the periphery of electronic device 200" (enclosure) that define a "volume 222" (cavity)

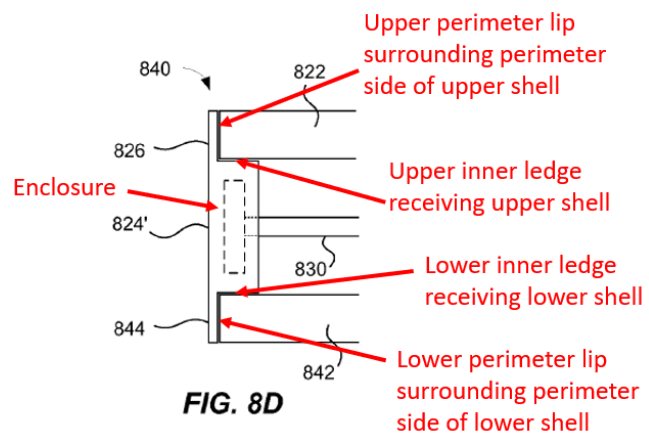


for retaining components. APPLE-1113, [0089]-[0090], [0077]-[0078], [0053]-[0057] ("front and back open area"). As shown in FIG. 2B, the outer periphery member 220 (enclosure) is "substantially rectangular" with "rounded edges or corners" and the volume has upper and lower openings. *Id.* As discussed at [21b], *supra*, Pakula discloses that the processing board (PCB) is positioned within the cavity. *Id.*, [0066], [0069]-



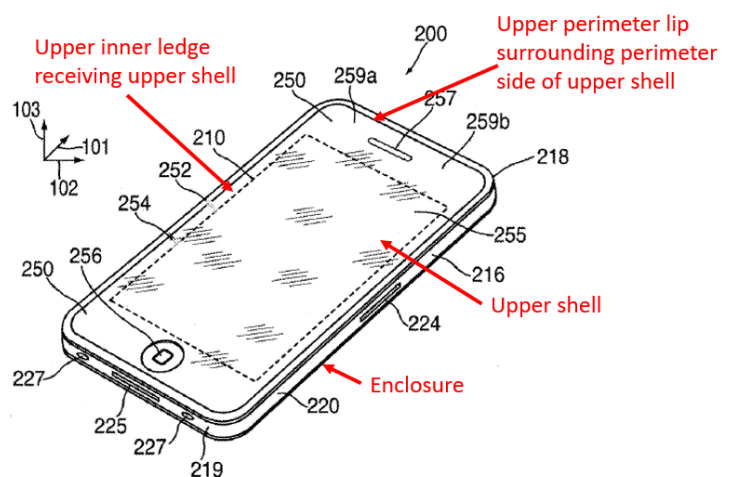
[0070], [0085]-[0086]. As shown in FIG. 2B (previous page), the upper and lower openings of periphery member 220 include respective perimeter lips sized and configured to receive the upper and lower shells. Pakula describes the upper and lower openings as having the claimed upper and lower perimeter lips and inner ledges, stating that “outer periphery member can include one or more depressions, *recesses, channels, protrusions*, or openings for supporting components.” *Id.*,

[0064], [0069] (“shelves”). For example, FIG. 8D (right) shows additional details of a specific embodiment in which perimeter sides of the front and back covers (822,

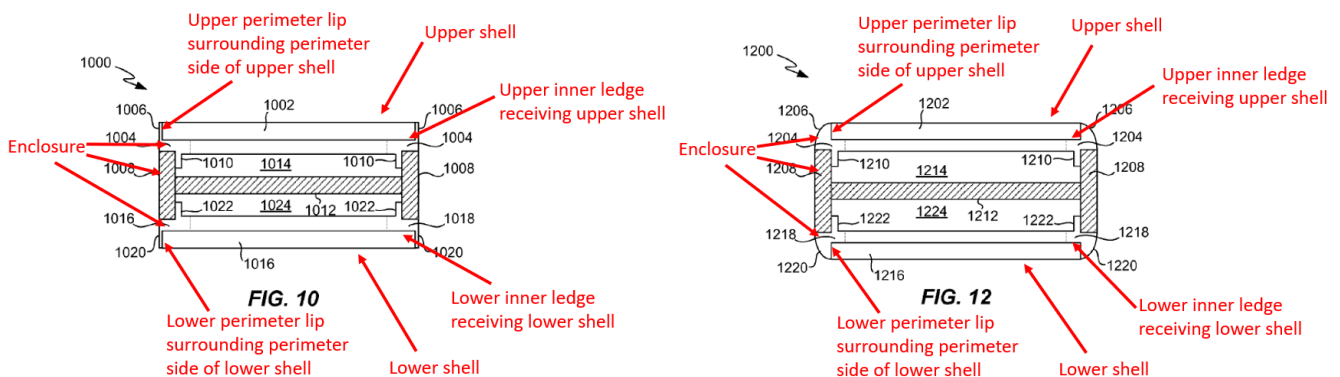


842) are surrounded by the upper and lower perimeter lips, respectively, and the upper and lower openings include respective inner ledges with the respective inner

ledges and perimeter lips sized and configured to receive the front and back covers. APPLE-1109, ¶¶85, 27; APPLE-1113, [0114]-[0117]. In another example, FIG. 2A (right) shows that the rounded rectangular enclosure (periphery member 220)



includes an upper perimeter lip that surrounds perimeter sides of front cover 250 and an upper ledge (support structure 252) such that front cover 250 fills the opening. APPLE-1113, [0090]-[0091], [0094]. Pakula is also states that “back cover assembly and front cover assembly can be connected relative to outer periphery member *in the same...manners*” thus indicating that the disclosure of FIG. 2A applies equally to the back cover/lower opening. *Id.*, [0092]; APPLE-1109, ¶86. FIGs. 10 and 12 (below) provide additional examples of embodiments having the claimed configuration. APPLE-113, [0121]-[0136]; APPLE-1109, ¶¶87-89. While these examples show the outer periphery member (enclosure) made up of several components, in such embodiments the multiple “elements can be connected in any suitable manner to form a single unit.” APPLE-1113, [0054].



implementation involves a glucose monitor, Dalke (incorporated by reference in Poeze) provides additional details that in the pulse oximeter implementations, the sensor includes “light emitting diodes (LEDs) that transmit optical radiation of *red and infrared wavelengths*” for measuring SpO2 and pulse rate. APPLE-1112, [0005] *see also* APPLE-1111, [0168] (“LEDs 1102 for emitting red and/or infrared light”); APPLE-1109, ¶90. Additionally or alternatively, a POSITA would have been well aware that red and infrared wavelengths were traditionally used in pulse oximetry to determine SpO2 and heart rate and therefore would have implemented Poeze to utilize such wave lengths to determine these physiological parameters. APPLE-1109, ¶90 (citing APPLE-1010, [0006]-[0010], [0025], [0062]-[0064], [0068]-[0070]; APPLE-1091, [0007], [0009], [0052]-[0054]; APPLE-1005, [0288]; APPLE-1092, 16:9-14; APPLE-1106, 23-24).

[21p]

Poeze’s system is “portable.” APPLE-1110, [0009], [0006] (“Portability of these monitoring systems is advantageous”), [0034]. As shown in FIG. 2B, the monitor 118 (processing board) and sensor 116 are included together and portable.

APPLE-1110, [0029], [0031],
APPLE-1109, ¶¶91-93. The
“health data collection device 112”

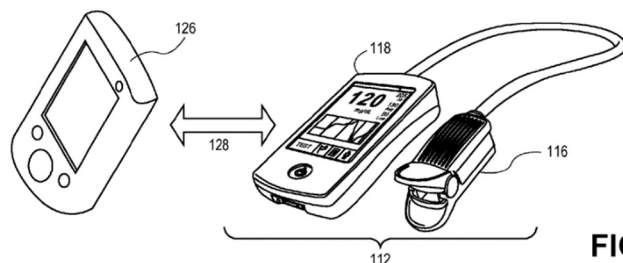


FIG. 2B

that includes monitor 118 and sensor 116 wirelessly connects to smartphone 126.

Id., [0031], [0034]-[0035]; *supra*, [21e]. The smartphone 126 of the resulting system displays the physiological data. *Supra*, [21g]-[21i]; APPLE-1110, [0062].

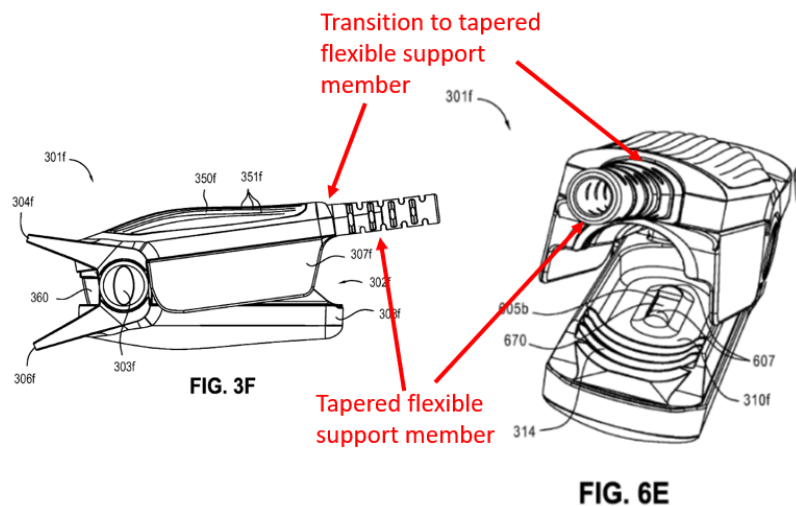
[23a]

Kianl provides element [23a] in the Poeze-Kianl-Baba-Pakula system for the reasons discussed with respect to claim 17 in the Petition. Pet., §III.C.2; APPLE-1003, ¶¶100-112; APPLE-1006, 2:18-31, 1:33-37, 5:65-6:15, 11:6-49, 14:18-30, 15:11-40, FIGs. 4, 1010; APPLE-1109, ¶¶95-97.

[23b]

As discussed above, Poeze incorporates by reference Poeze-040 to provide “[e]xample portable non-invasive monitoring devices” for use as the health data collection device 112 (which includes the monitor 118 and sensor 116) in Poeze’s system. APPLE-1110,

[0029]. Poeze-040 shows that its finger sensor includes a transition to a tapered flexible support member having recessed portions that provide



flexibility, as shown in FIGs. 3F, 6E (above) and 17 (next page). APPLE-1111, [0281]-[0282], [0129], [0145]; APPLE-1109, ¶¶98-109. A POSITA would have

recognized that the flexible cable support depicted in Poeze-040 is tapered.

APPLE-1109, ¶100. While Poeze-040 depicts the tapered flexible support member

and its associated transition as attaching to the

finger clip sensor, it would have been obvious

and beneficial to include such a flexible support

member where the cable that attaches to the
monitor enclosure (as modified based on Pakula)

to provide extra support and “provide[] relief

from lateral bending of the cable” at the point

where it connects with the monitor to allow for a

degree of motion at the junction of the cable and monitor enclosure while also

preventing breaking or wear on the cable at the junction. APPLE-1109, ¶¶101-105;

APPLE-1118, [89]. For example, both Poeze and Poeze-040 show embodiments in

which the monitor enclosure includes a transition to a tapered support member:

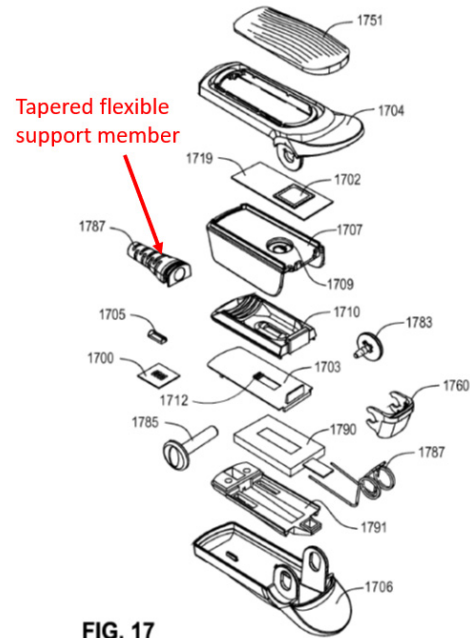


FIG. 17

Transition to tapered
support member

Tapered support
member

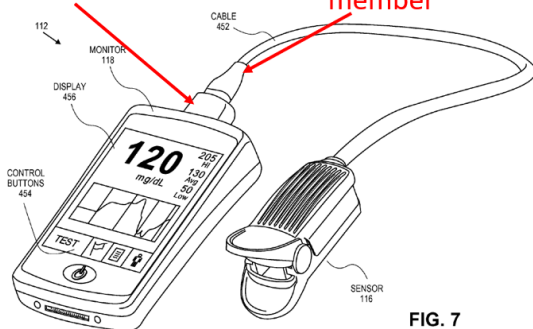


FIG. 7

APPLE-1110, FIG. 7

Transition to tapered
support member

Tapered support
member

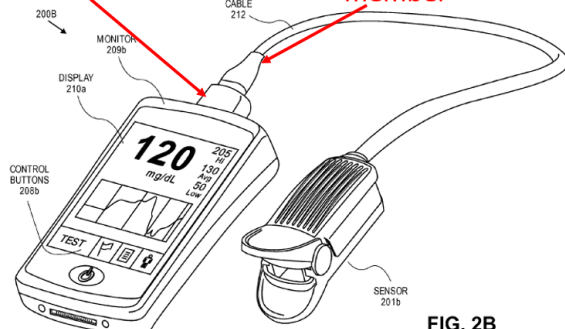


FIG. 2B

APPLE-1111, FIG. 2B

It would have obvious to make the tapered support member at the junction of the cable the monitor flexible (based on Poeze-040's flexible spring 1787 at the finger clip) to add extra flexibility to the junction while preventing breaking and wearing of the cable at the junction. APPLE-1109, ¶¶101-103. Additionally or alternatively, use of tapered flexible support members and respective transitions at the junction of a cable and a more ridged component/enclosure was well-known in the prior art for "provid[ing] relief from lateral bending of the cable" to prevent "sharp bends" and "breakage" and the Poeze-Kianl-Baba-Pakula combination would have been predictably combined with any of these known prior art references to include bend relief members at the junction of the cables and the monitor 118 in the resulting system. APPLE-1118, [89], [45], FIGs. 9, 19-21; APPLE-1123, [0002]-[0004], [0032]-[0039]; FIGs. 1-3; APPLE-1121, FIGs. 1-7; APPLE-1109, ¶103, 106-109.

Additionally, it would have been obvious to include a second transition from the enclosure to a second tapered flexible support member on the opposite side of the monitor enclosure to provide the same bend relief benefits described above for a second cable connectable to additional devices. APPLE-1109, ¶¶104-105. FIG. 7 of Poeze shows that the monitor includes a port for connection to a peripheral device

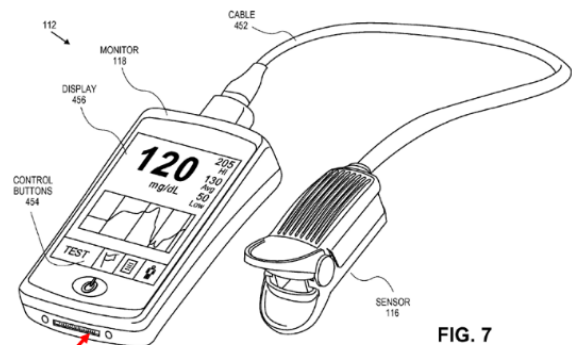


FIG. 7

Cable connection
port on opposite end

on the opposite end of the cable 452 and it would have been obvious and beneficial to use a similar flexible tapered support and transition at this opposite end. *Id.*; APPLE-1110, [0096]. Such an additional transition, flexible support member, and cable would, for example, allow for connection to additional sensors such as blood pressure, body temperature, or glucose sensor or accelerometer. APPLE-1110, [0086], [0082]. Additionally, Poeze explains that the monitor can communicate with the computing device 126 using “a wired or wireless connection” and inclusion of a second cable with a corresponding flexible tapered support and transition would allow users to have the option to use a wired connection between the devices as a backup or alternative to the wireless connection. *Id.*, [0034]; APPLE-1109, ¶105. As another example, the bottom port of the monitor can serve as “an AC or DC power port” as expressly contemplated by Poeze and use of a flexible tapered support and transition for that port would provide the same additional benefits described above. *Id.*, [0096]. Inclusion of a second transition from the enclosure to a second tapered flexible support member opposite the first transition/support member is also obvious because “the mere duplication of parts has no patentable significance unless a new and unexpected result is produced.” *In re Harza*, 274 F.2d 669 (CCPA 1960). Indeed, such a configuration was known in the prior art. APPLE-1118, [89], FIGs. 10, 19-21; APPLE-1122, FIG. 1.

[23c]

As discussed in §I.D, *supra*, the only possible support for a wrist-mounted device in the '507 specification is a single mention that the MCD could be a “wristwatch” identified as an alternative implementation to “a smartphone.” EX2045, [0023]. Poeze provides this element at least because of its nearly identical description that the “general purpose computing device” executing “the personal health organizer” software (the claimed MCD) could be implemented as “a wristwatch computer” as an alternative to “a mobile phone.” APPLE-1110, [0010].

Additionally, Poeze discloses that the monitor 118 can include “straps that facilitate attachment to a patient’s...arm.” *Id.*, [0095]; APPLE-1111, [0096], FIG. 2C. Poeze leaves it to a POSITA to determine the location on the arm for attaching the monitor. Baba suggests the conventional location of the patient’s wrist for such physiological monitors. APPLE-1114, [0051]-[0052]. Such a positioning at the wrist (as suggested by Baba) would allow the resulting monitor to be easily “worn on the user’s wrist and removed as desired.” *Id.* Positioning at the wrist would allow the user to easily interact with the monitor, including to view display information of the monitor, to attach peripheral devices to the monitor (e.g., additional sensors), to provide input directly to the monitor (rather than or in addition to through the smartphone), and to easily carry the monitor in an attached manner without getting in the way of the user’s clothing. APPLE-1109, ¶¶110-114.

Additionally, Poeze expressly contemplates tracking activity and “physical movement of the user,” and Baba discloses that positioning the monitor and a related accelerometer at the wrist allows for “detect[ing] steps taken by the user as an indicator of the user's body movement” by “detect[ing] the acceleration of the arm swing in conjunction with the user's walking motion.” APPLE-1110, [0052], [0062]; APPLE-1114, [0063], [0068]-[0069]; APPLE-1109, ¶113.

[24]

While Pakula and Poeze do not expressly describe the housing for the monitor 118 in the resulting system as being water-proof, Pakula describes attaching the covers using a “liquid adhesive” which a POSITA would have recognized as providing at least some degree of protection against water damage to the internal processing board. APPLE-1113, [0106], [0110]-[0111]; APPLE-1109, ¶117. Alternatively, Poeze describes implementing “the personal health organizer” using “a water-proof case,” and a POSITA would have recognized that implementing the case for the monitor 118 in the resulting system to also be water-proof would have beneficially allowed the device to “withstand water pressure up to 300M in depth” to allow “divers to use the personal health organizer under water.” APPLE-1110, [0037]; APPLE-1114, [0127] (“water diving”); APPLE-1109, ¶116. Such an implementation also would have protected the internal

circuitry from water damage during rain or other circumstances when water is present. APPLE-1109, ¶116.

B. RMTA Ground 1B: The Poeze-Kianl-Baba-Pakula-Moon Combination Renders Obvious Sub. Claim 22

1. Combination of Poeze-Kianl-Baba-Pakula with Moon

Moon is summarized in the Petition. Pet., §III.J. Poeze's system is intended for use by users in motion. APPLE-1110, [0013], [0052], [0082], [0006], A POSITA would have been motivated to modify Poeze's system based on Moon such that the monitor 118 (processing board) applies advanced signal processing with data filtering, such as to reduce the effects of motion on vital sign readings and filter out noise for reasons similar to those discussed for the Mendelson-Moon combination in the Petition (Pet., §III.J.2; APPLE-1003, ¶¶214-225) including to (1) filter noise caused by user motion to "greatly enhance the accuracy" of the detected vital signs; (2) allow for "true continuous monitoring" of "ambulatory patients"; and (3) "minimize the occurrence of false alarms and, additionally, make accurate readings in the presence of motion." APPLE-1010, [0015], [0025], [0065]-[0066], [0070], [0072]-[0074], [0076], [0082]-[0083], [0088]-[0093] ("The matched filter improves the signal-to-noise ratio"), [0102]-[0103]; APPLE-1011, 1-4; APPLE-1109, ¶¶118-126. This modification also reduces noise due to other factors and increases the overall accuracy of the SpO₂ and heart rate calculations. APPLE-1010, [0072]-[0073]; APPLE-1109, ¶123.

2. Application to Claim 22

[22pre]-[22b]

Kianl provides elements [22pre]-[22b] in the Poeze-Kianl-Baba-Pakula-Moon system for the reasons discussed with respect to claim 14 in the Petition. Pet., §III.C.2; APPLE-1003, ¶¶100-110; APPLE-1006, 11:6-31, 15:11-40, FIG. 10.

[22c]

Moon describes that “the oximeter processes PPG waveforms.” APPLE-1010, [0007], [0017]-[0019]; [0062], [0065]-[0074]. This processing includes filtering the PPG and PTT waveforms (data) using detected motion of the patient to more accurately determine SpO₂. *Id.*, [0025], [0073]-[0074], [0089]-[0094]; Pet., §III.J.3; APPLE-1003, ¶¶215-216, 228-229. For example, if “a pulse is corrupted by noise” due to movement, the system “deploys a ‘matched filter’ to process both the RED/IR(PPG) waveforms to maximize signal-to-noise ratios of the pulses therein” to “determine accurate SpO₂ and cNIBP values even when motion-related noise is present.” APPLE-1010, [0088]-[0089], [0025]; APPLE-1109, ¶123. Moon also describes filtering out “unwanted and relatively high-frequency electrical and mechanical noise” to “increase[] the accuracy.” *Id.*, [0072]-[0073].

C. RMTA Ground 1C: The Poeze-Kianl-Baba-Pakula-Diab Combination Renders Obvious Sub. Claim 22

To the extent that “advanced signal processing algorithm” is interpreted to read in features from the specification of “parallel engines and adaptive filters”

(APPLE-1001, 6:7-12), such functionality was known in prior art pulse oximetry systems, as demonstrated by Diab. APPLE-1109, ¶¶130-135

1. Overview of Diab

Diab discloses “pulse oximetry systems and methods” that “filter motion artifacts and other noise using a variety of techniques.” APPLE-1120, Abst., 3:13-27, 1:47-54, 2:1-8, Cl. 11. For example, “linear, nonlinear and statistical filtering techniques may be applied to reliably estimate the blood saturation values.” *Id.*, 8:38-9:10. To correct for “motion artifacts” and other noise, Diab applies “adaptive filtering” in combination with “frequency-domain techniques” and “time-domain analysis” along with “parallel engines executing two or more...techniques in parallel” to “provide the best estimates of the saturation values.” *Id.*, 9:48-10:14.

2. Combination of Poeze-Kianl-Baba-Pakula with Diab

A POSITA would have been motivated to implement adaptive filtering and parallel engines as part of the processing performed by Poeze’s monitor 118 to “manag[e] motion artifacts” based on Diab’s suggestions for reasons similar to those discussed with respect the application of Moon to Mendelson (Pet., §III.J.2; APPLE-1003, ¶¶218-225) and Moon to Poeze-Kianl-Baba-Pakula (*Supra*, §III.B.1) for managing/correcting motion artifacts. APPLE-1120, 9:42-10:14; APPLE-1109, ¶132. Such application of Diab to Poeze would correct for the “dramatic” effects and “drawbacks” of motion artifacts and any other “extraneous disturbing source

that affects the shape or quality of the optically detected photopleth signal” to “provide the best estimates of the saturation values” and “best overall performance” for the system. APPLE-1120, 9:42-10:14; APPLE-1109, ¶132.

3. Application to Claim 22

[22pre]-[22b]

See RMTA Ground 1B, *supra*; Pet., §III.C.2; APPLE-1003, ¶¶100-110.

[22c]

Diab shows that in the predictable combination, the processing of the signals received at the processing board includes applying an advanced signal processing algorithm that includes application of “adaptive filtering and frequency-domain techniques” and “use of multiple parallel engines executing two or more of the foregoing techniques in parallel.” APPLE-1120, 9:48-10:14; APPLE-1109, ¶135.

D. RMTA Ground 1D: The Poeze-Kianl-Baba-Pakula-Teller Combination Renders Obvious Sub. Claims 23-24

1. Combination of Poeze-Kianl-Baba-Pakula with Teller

Teller describes a physiological sensor device having “an armband adapted to be worn by an individual” and a sealed, water resistant computer housing. APPLE-1104, [0005], [0018], [0093], [0098]. A POSITA would have been prompted to modify Poeze’s monitor enclosure (as modified based on Pakula) to include the arm straps and water resistant features of Teller for multiple reasons. APPLE-1109, ¶¶136-138. Poeze discloses that the monitor 118 can include “straps

that facilitate attachment to a patient's...arm" and Teller provides details on tapered support straps that "can be adjusted to fit arms of various sizes" and uses "soft foam fabric" to "fit comfortably" during exercise and allow for easy attachment and removal using simple pull tabs and velcro loops. APPLE-1110, [0095]; APPLE-1104, [0095], [0099], [0077]-[0078]. Applying a water tight seal would have beneficially allowed the monitor "to be worn while swimming without adversely affecting the performance thereof" while "maintain[ing] the integrity of [the] housing" to protect sensitive internal components from water damage. APPLE-1104, [0098]-[0101]; APPLE-1109, ¶138.

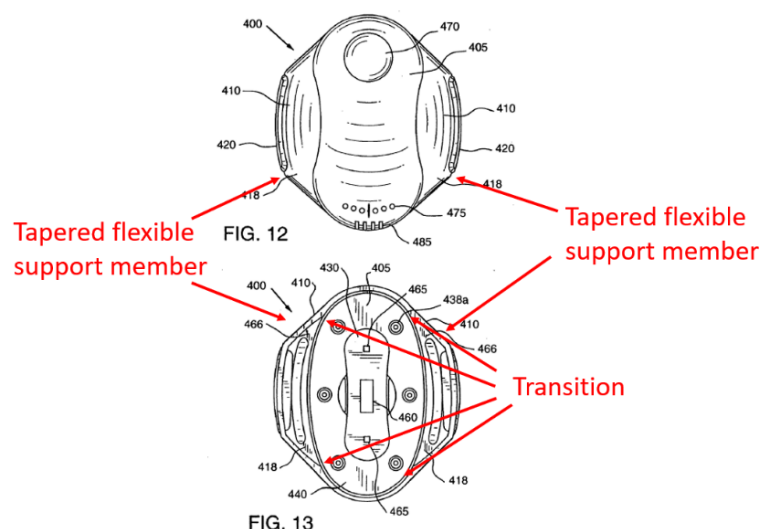
2. Application to claims

[23a]: See RMTA Ground 1A, *supra*; Pet., §III.C.2; APPLE-1003, ¶¶100-112.

[23b]

Teller demonstrates that the resulting arm band monitor enclosure includes first and second transitions to tapered flexible support members. APPLE-1104, FIGs. 12-19; [0093]-[0101].

As shown in FIGs. 12-13 (right), Teller's assembly includes "*flexible* wing body 410" having tapered support members on opposite sides of



housing 405 that *support* the housing on the user's arm. *Id.* The flexible wing body 410 further includes a flexible ring that provides respective first and second transitions to the tapered flexible support members. *Id.*, [0116], FIGs. 12-19, APPLE-1109, ¶142.

[23c]

Although Teller describes the primary position for the armband is on the “upper arm” (APPLE-1104, [0093]) a POSITA would have recognized that it would have been beneficial and obvious to position the armband on the user's wrist based on Baba's suggestion for the reasons discussed in RMTA Ground 1A, *supra*. APPLE-1109, ¶¶143-144. Alternatively, Teller describes providing “a remote control device incorporated into a wristwatch” to beneficially provide a convenient and easy to use input device for the physiological sensor, which satisfies the claimed “wrist-mounted device” that is “provided together with” the sensor and processing board. APPLE-1104, [0118]; APPLE-1109, ¶145.

[24]

Teller provides that the resulting monitor enclosure is “water resistant” and has “a water tight seal.” APPLE-1104, [0098]-[0101]; APPLE-1109, ¶146.

E. RMTA Grounds 2A-2D

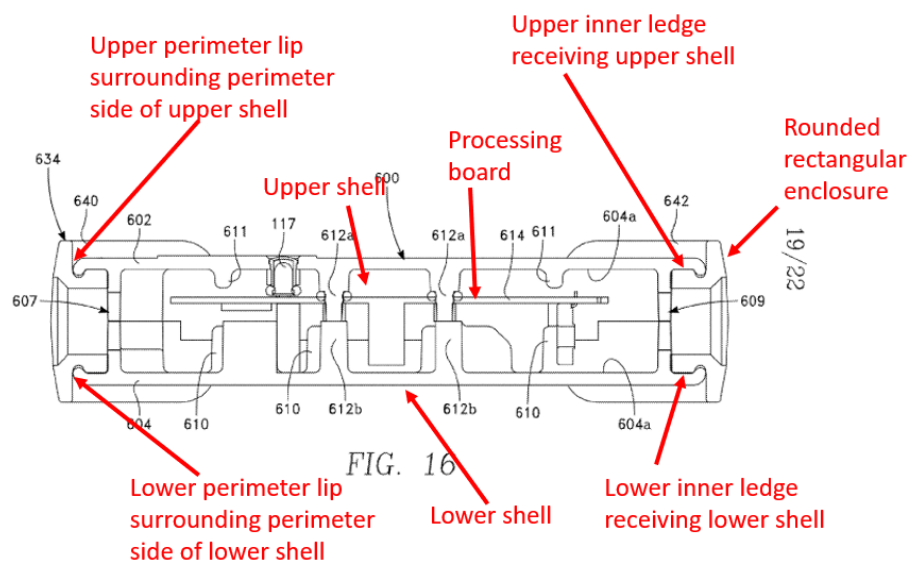
To the extent that element [21m] is interpreted narrowly under *SuperGuide v. DirecTV Enters.* (358 F.3d 870 (Fed. Cir. 2004)), a POSITA would have been

prompted to apply Lin to each of the combinations in Grounds 1A-1D to authenticate user data access using “sensors operative to detect a fingerprint, voice print, [or] facial features.” APPLE-1119, [0004]; APPLE-1109, ¶¶147-148. Such an implementation to allow a user to use fingerprint, facial, or voice recognition authentication to access private user data would have beneficially provided security for sensitive data while giving users more options for performing such authentication according to user preference. APPLE-1109, ¶¶147-148.

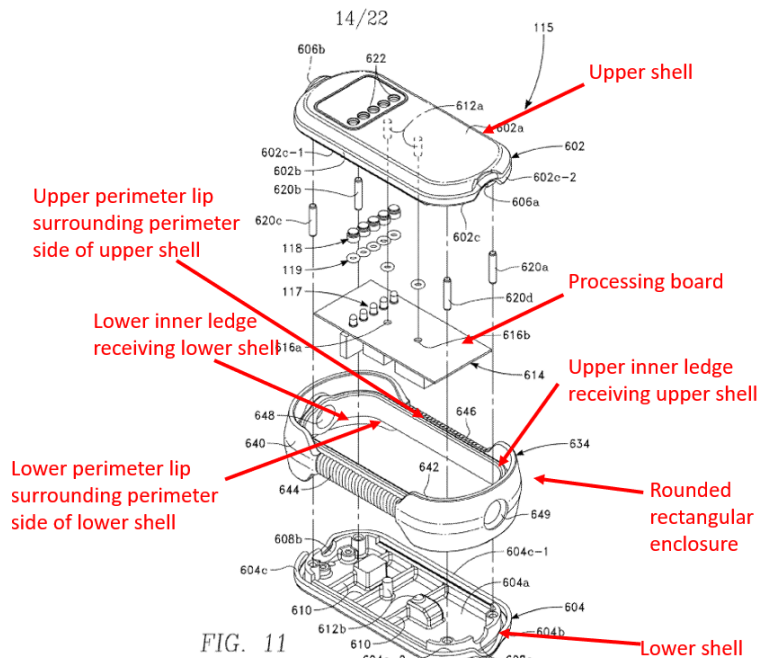
F. RMTA Grounds 3A-4D

Soden provides another example of a protective assembly (elements [21n], [23b], [24]) for a processing board ([21b]) that would have been predictably and beneficially used in place of Pakula in each of the combinations of Grounds 1A-2D to form Grounds 3A-4D. APPLE-1109, ¶¶149-155; APPLE-1118, FIGs. 10-21, [78]-[89]. Soden describes a “circuit board 614” supporting “electronic

components” that is “sealed within the housing 230 from any external moisture” having “a top half shell 602 and a bottom half

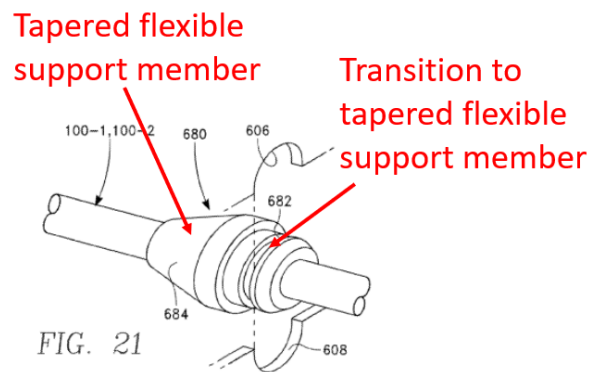


shell 60” surrounded by bumper 634 (outer case 634a) having upper and lower inner ledges and perimeter lips for receiving the top and bottom shells. *Id.* The housing is “water-proof.” APPLE-1118, [58]. The rounded rectangular



enclosure of the housing further includes first and second transitions to tapered flexible support members on opposite sides (FIG. 21, below). *Id.*, FIGs. 10, 19-21, [86]-[89] (“fitting 680 may include a flexible conical section 684 that provides relief from lateral bending of the cable.”).

A POSITA would have applied Soden to the various combinations to support the



electronic components of Poeze’s monitor 118 on a processing board in a housing to “protect[] from moisture, mechanical shock, electrical shock and tampering” and “provide[] relief from lateral bending” of input cables. *Id.*, [60], [78]-[80], [89]; APPLE-1109, ¶¶151, 154-155.

IV. OTHER REFERENCES MATERIAL TO PATENTABILITY

Many RMTA claim features are also taught by a host of other references:

Features	Prior Art References
Wired connection between an optical sensor and a processing board, wireless connection from processing board to MCD	APPLE-1010, ¶¶[0010], [0013], [0060], [0120], [0139]; APPLE-1097, 2-3, FIG. 1; APPLE-1101, 8:51-55, 14:40-50, 15:48-52; APPLE-1091, ¶¶[0046]-[0065], [0072]-[0079]; APPLE-1131, [0021]-[0024], [0026]-[0032], [0034]-[0035].
Receiving analog signals from the optical sensor	APPLE-1010, ¶¶[0013],[0060]; APPLE-1102, 12:30-64; FIG. 7, FIGS. 10-11; APPLE-1091, ¶¶[0054]-[0056].
Protective assembly with rounded rectangular enclosure having inner ledges receiving upper/lower shells	APPLE-1124, FIGs. 1-4; APPLE-1125, FIGs. 1-5; APPLE-1126, FIGs. 1-4, 5B; APPLE-1127, FIGs. 1-8; APPLE-1116, FIGs. 4-7, 25-33
Tapered flexible wrist band support members for electronics assembly	APPLE-1128, FIGs 1, 3-4, [0016]-[0017], Cl. 12; APPLE-1129, FIGs. 2-7, 9-10; APPLE-1102, FIGs. 3-3B; APPLE-1116, FIGs. 2-7, 23; APPLE-1101, FIG. 15C.
Water resistant enclosure	APPLE-1095, 15; APPLE-1105, ¶¶ [0065], [0134]-[0135]; APPLE-1130, [0133]-[0135]

V. CONCLUSION

Petitioner respectfully requests denial of Masimo's RMTA.

Respectfully submitted,

Date: April 3, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on April 3, 2025, a complete and entire copy of this Petitioner's Opposition to Patent Owner's Revised Motion to Amend and Accompanying Exhibits were provided by email to Patent Owner by serving the correspondence email addresses of record as follows:

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