

Apple Inc. (Petitioner)
v.
Masimo Corporation (Patent Owner)

Petitioner Demonstratives

Case No. IPR2024-00294
U.S. Patent No. 10,736,507

Before Hon. Richard H. Marschall, David Cotta, and Alyssa A Finamore,
Administrative Patent Judges

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Table of Contents

<u>Section</u>	<u>Slide</u>
'507 Patent Overview	4
Original Petition - Mendelson Grounds	10
Overview of Mendelson	11
Mendelson's Sensor Module outputs "one or more signals responsive to light from a light source attenuated by tissue of the user " (Elements [1b], [13a])	14
D'Angelo Is Prior Art to the '507 Patent	34
Patent Owner Has Failed To Establish an Earlier Date of Invention	42
A POSITA Would Have Been Prompted to Combine Mendelson and D'Angelo	48
A POSITA Would Have Been Prompted to Combine Mendelson and D'Angelo with Goldsmith	69
Revised Motion to Amend	71
Masimo's Proposed Substitute Claims Lack Written Description Support	76
Masimo's Proposed Substitute Claims are Indefinite	101
Apple's Citation to its Petition is Proper	107
The Prior Art Renders Substitute Claims Obvious	110
The Opposition Does Not Rely on Hindsight	111

Table of Contents

<u>Section</u>	<u>Slide</u>
The Prior Art Renders Substitute Claim 21 Obvious	113
Obvious to Mount Poeze's ADC and Signal Processor on a Circuit Board Based on Pakula	121
Obvious to Apply Kianl and Baba's Teachings to Poeze	126
Obvious to Apply Moon's Teachings to Poeze	135

'507 Patent Overview

Overview of the '507 Patent



US010736507B2

(12) **United States Patent**
Muhsin et al.

(10) **Patent No.:** **US 10,736,507 B2**
(45) **Date of Patent:** **Aug. 11, 2020**

(54) **PHYSIOLOGICAL MONITOR WITH MOBILE COMPUTING DEVICE CONNECTIVITY**

(71) Applicant: **MASIMO CORPORATION**, Irvine, CA (US)

(72) Inventors: **Bilal Muhsin**, Aliso Viejo, CA (US); **Sujin Hwang**, Rancho Santa Margarita, CA (US); **Benjamin C. Trlman**, Rancho Santa Margarita, CA (US)

(73) Assignee: **Masimo Corporation**, Irvine, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/880,071**

(22) Filed: **Jan. 25, 2018**

(65) **Prior Publication Data**
US 2019/0000317 A1 Jan. 3, 2019

Related U.S. Application Data

(63) Continuation of application No. 14/033,315, filed on Sep. 20, 2013, now Pat. No. 9,877,650.

(60) Provisional application No. 61/703,729, filed on Sep. 20, 2012.

(51) **Int. Cl.**
A61B 5/1455 (2006.01)
A61B 5/0476 (2006.01)
A61B 5/0402 (2006.01)
A61B 5/0205 (2006.01)
A61B 5/00 (2006.01)
A61B 7/00 (2006.01)

(52) **U.S. CL.**
CPC **A61B 5/0002** (2013.01); **A61B 5/0205** (2013.01); **A61B 5/0402** (2013.01); **A61B 5/0476** (2013.01); **A61B 5/1455** (2013.01); **A61B 5/7203** (2013.01); **A61B 5/7225** (2013.01); **A61B 5/742** (2013.01); **A61B 7/003** (2013.01); **A61B 2562/22** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

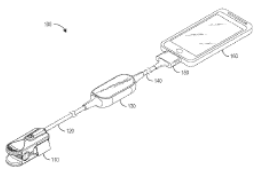
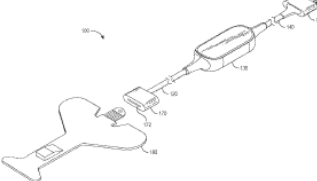
(56) **References Cited**
U.S. PATENT DOCUMENTS

5,692,505 A	12/1997	Fouts
5,769,785 A	6/1998	Diab et al.
6,002,952 A	12/1999	Diab et al.
6,157,850 A	12/2000	Diab et al.
6,658,276 B2	12/2003	Kiani et al.
6,770,628 B1	8/2004	Ali et al.
2006/0224619 A1	10/2006	Svedlow et al.
2008/0071153 A1	3/2008	Al-Ali et al.
2008/0211657 A1	9/2008	Ohio
2010/0160798 A1*	6/2010	Bumet
2010/0198094 A1	8/2010	Turicchia et al.

(Continued)
Primary Examiner—Eric T Winkler
Assistant Examiner—Marjan Farhanesh
(74) **Attorney, Agent, or Firm**—Knobbe, Martens, Olson & Bear, LLP

(57) **ABSTRACT**
Systems and method for monitoring patient physiological data are presented herein. In one embodiment, a physiological sensor and a mobile computing device can be connected via a cable or cables, and a processing board can be connected between the sensor and the mobile computing device to conduct advanced signal processing on the data received from the sensor before the data is transmitted for display on the mobile computing device.

20 Claims, 15 Drawing Sheets

- The '507 Patent was filed Jan. 25, 2018, and its earliest claimed priority date is Sep. 20, 2012.
- The '507 Patent includes 20 claims.
- The IPR2024-00294 Petition challenges all claims (claims 1-20), of which claims 1 and 13 are independent.

APPLE-1001 ('507 Patent), Cover Page.

Overview of the '507 Patent

FIGS. 1A, 1B, and 1C illustrate embodiments of a physiological monitoring system 100. The physiological monitoring system 100 shown in FIG. 1A includes a sensor 110, first cable 120, processing module 130, second cable 140, connection port 150, and a mobile computing device, illustrated here as smartphone 160. Although specific reference can be made to smartphones in this disclosure, any mobile computing device compatible with the physiological sensor system can be used. A compatible mobile computing device can be one of a wide range of mobile devices such as a mobile communications device (such as a smartphone),

measurement data. Smartphone 160 can be coupled to the processing module 130 by a second cable 140 and connection port 150, in some embodiments, and in other embodiments can be configured to wirelessly transmit the parameter data to the smartphone 160 or another computing device.

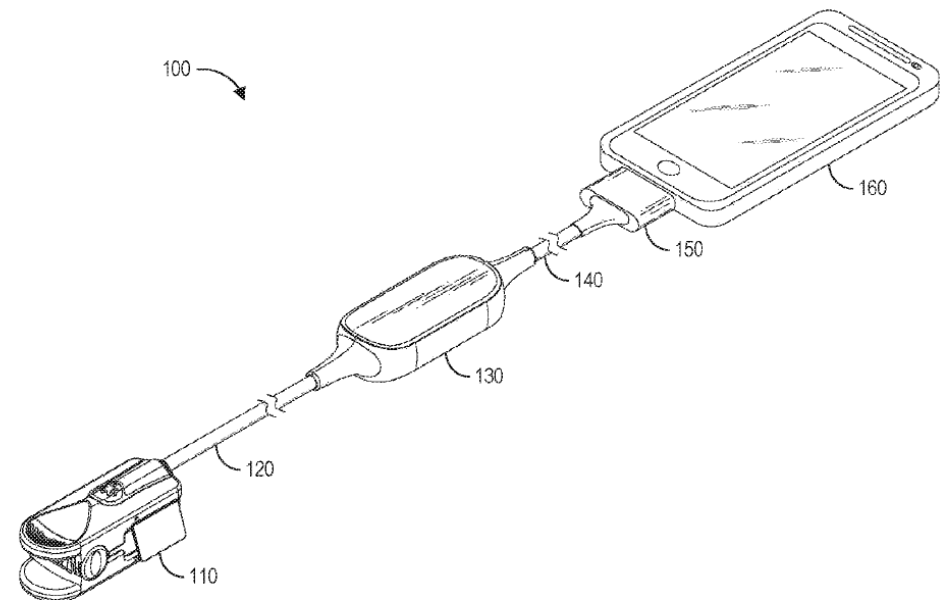
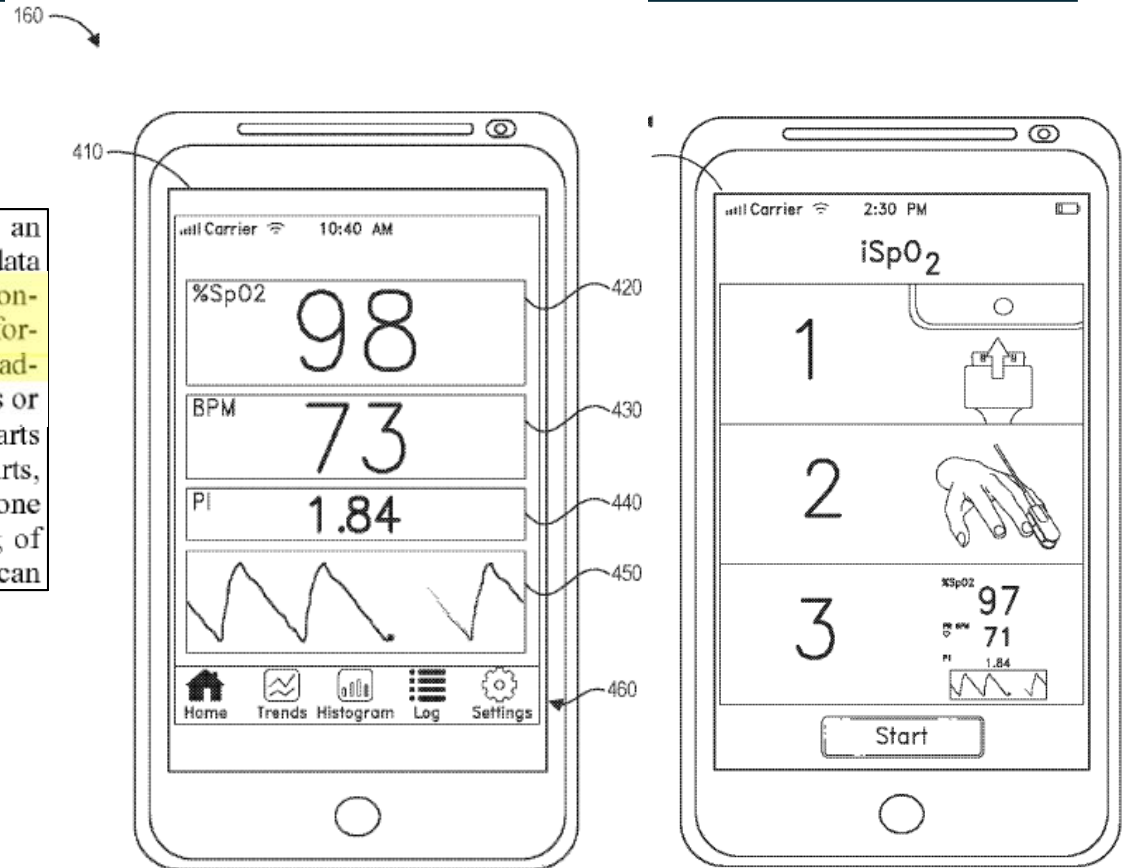


FIG. 1A

Overview of the '507 Patent

The smartphone 160 can include software such as an application configured to manage output measurement data from the processing module 130. The application functionality can include trend analysis, current measurement information, alarms associated with above/below threshold readings, reminders to take measurement data at certain times or cycles, display customization, iconic data such as hearts beating, color coordination, bar graphs, gas bars, charts, graphs, or the like, all usable by a caregiver or smartphone user to enable helpful and directed medical monitoring of specified physiological parameters. The smartphone 160 can



'507 Patent Claims 1 and 13

1. A mobile pulse oximetry system for informing a user of mobile measurement of oxygen saturation ("SpO2"), the mobile pulse oximetry system comprising:

an SpO2 measurement system including:

an optical sensor configured to output one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

a processing board in data communication with the optical sensor and a mobile computing device including a display and cellular communication, wherein the processing board is configured to:

receive said one or more signals from the optical sensor;

process said one or more signals to generate SpO2 measurement values; and

output the SpO2 measurement values to the mobile computing device; and

one or more hardware processors of the mobile computing device configured to execute an application, the application configured to execute commands to:

generate a graphical user interface having a plurality of display portions;

display, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

display, in a different portion of the plurality of display portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application;

wherein the processing of the one or more signals to generate SpO2 measurement values is performed only on the processing board, thereby freeing up memory available to the mobile computing device; and

wherein the processing board is configured to draw power for operation from the mobile computing device.

13. A computer-implemented method of informing a user of mobile measurement of oxygen saturation ("SpO2"), the computer-implemented method comprising:

outputting, from an optical sensor of an SpO2 measurement system, one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

via a processing board of the SpO2 measurement system, the processing board in data communication with the optical sensor and a mobile computing device including a display:

receiving said one or more signals from the optical sensor;

processing said one or more signals to generate the SpO2 measurement values; and

outputting the SpO2 measurement values to the mobile computing device; and

via an application configured to execute commands on the mobile computing device:

generating a graphical user interface having a plurality of display portions;

displaying, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

displaying, in a different portion of the plurality of portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application.

Overview of Grounds Instituted Against '507 Patent

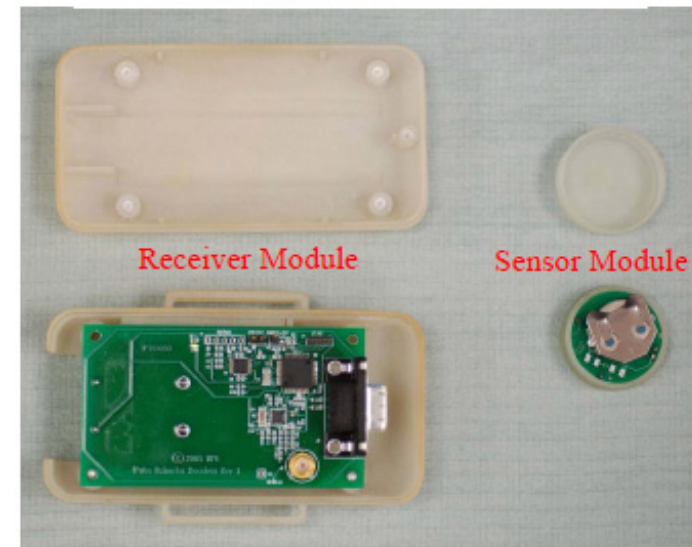
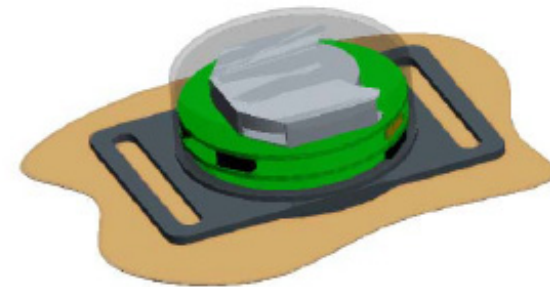
Ground	Claims	§102 Prior Art
1A1	13, 15, 18-19	Mendelson
Ground	Claims	§103 Prior Art
1A2	13, 15, 18-19	Mendelson
1B	16, 18, 20	Mendelson, Tran
1C	14, 17	Mendelson, Kianl
1D	1-2, 5, 7, 9, 12-15, 17-19	Mendelson, D'Angelo
1E	3	Mendelson, D'Angelo, Ording
1F	4-6, 8, 16, 18, 20	Mendelson, D'Angelo, Tran
1G	2, 7, 14, 17	Mendelson, D'Angelo, Kianl
1H	3	Mendelson, D'Angelo, Kianl, Ording
1I	10-11	Mendelson, D'Angelo, Goldsmith
2A	13, 15, 18-19	Mendelson, Moon
2B	16, 18, 20	Mendelson, Moon, Tran
2C	14, 17	Mendelson, Moon, Kianl
2D	1-2, 5, 7, 9, 12-15, 17-19	Mendelson, Moon, D'Angelo
2E	3	Mendelson, Moon, D'Angelo, Ording
2F	4-6, 8, 16, 18, 20	Mendelson, Moon, D'Angelo, Tran
2G	2, 7, 14, 17	Mendelson, Moon, D'Angelo, Kianl
2H	3	Mendelson, Moon, D'Angelo, Kianl, Ording
2I	10-11	Mendelson, Moon, D'Angelo, Goldsmith

Overview of Mendelson

Mendelson's System

Sensor Module: The Sensor Module contains analog signal processing circuitry, ADC, an embedded microcontroller, and a RF transceiver. The unit is small enough so the entire module can be integrated into a headband or a helmet. The unit is powered by a CR2032 type coin cell battery with 220mAh capacity, providing at least 5 days of operation.

Receiver Module: The Receiver Module contains an embedded microcontroller, RF transceiver for communicating with the Sensor Module, and a Universal Asynchronous Receive Transmit (UART) for connection to a PC. Signals acquired by the Sensor Module are received by the embedded microcontroller which synchronously converts the corresponding PD output to R and IR PPG signals. Dedicated software is used to filter the signals and compute SpO₂ and HR based on the relative amplitude and frequency content of the reflected PPG signals. A tri-axis MEMS accelerometer detects changes in body activity, and the information obtained through the tilt sensing property of the accelerometer is used to determine the orientation of the person wearing the device.



Mendelson's System

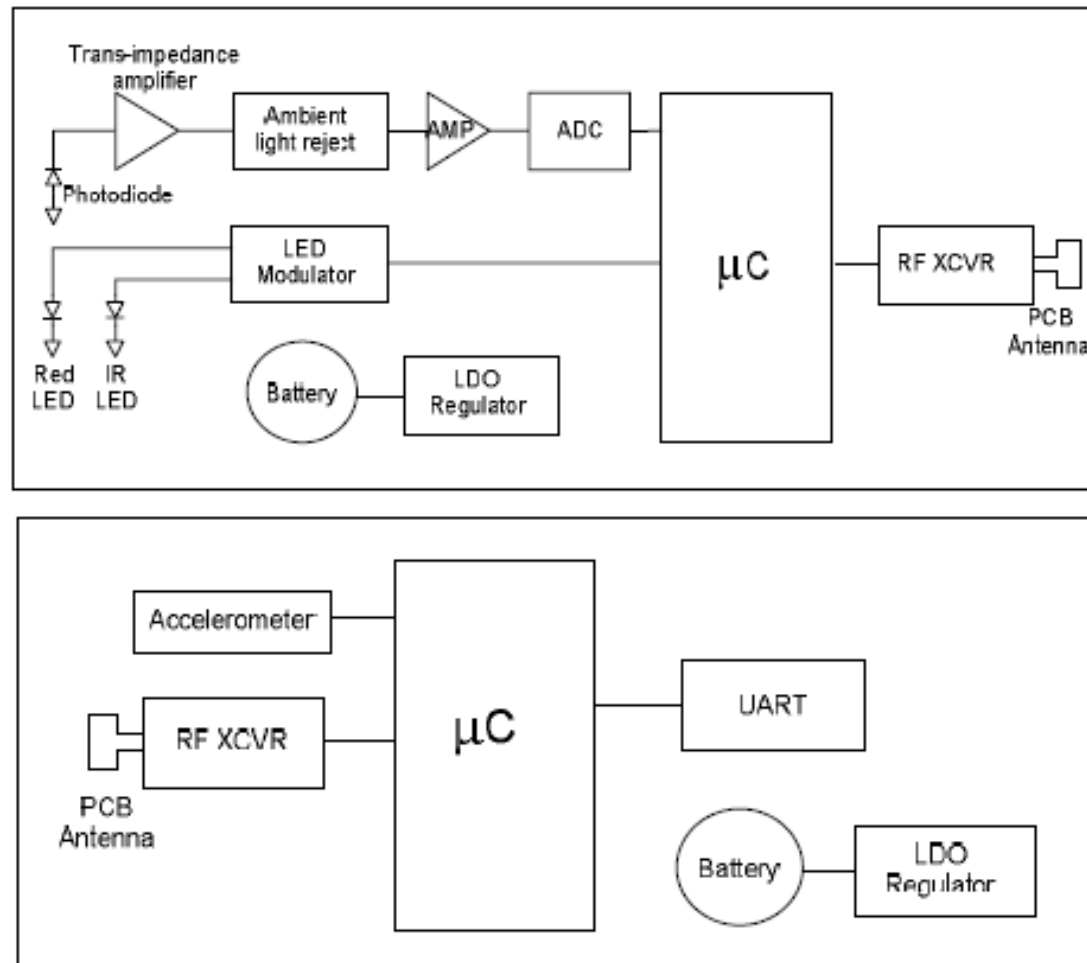
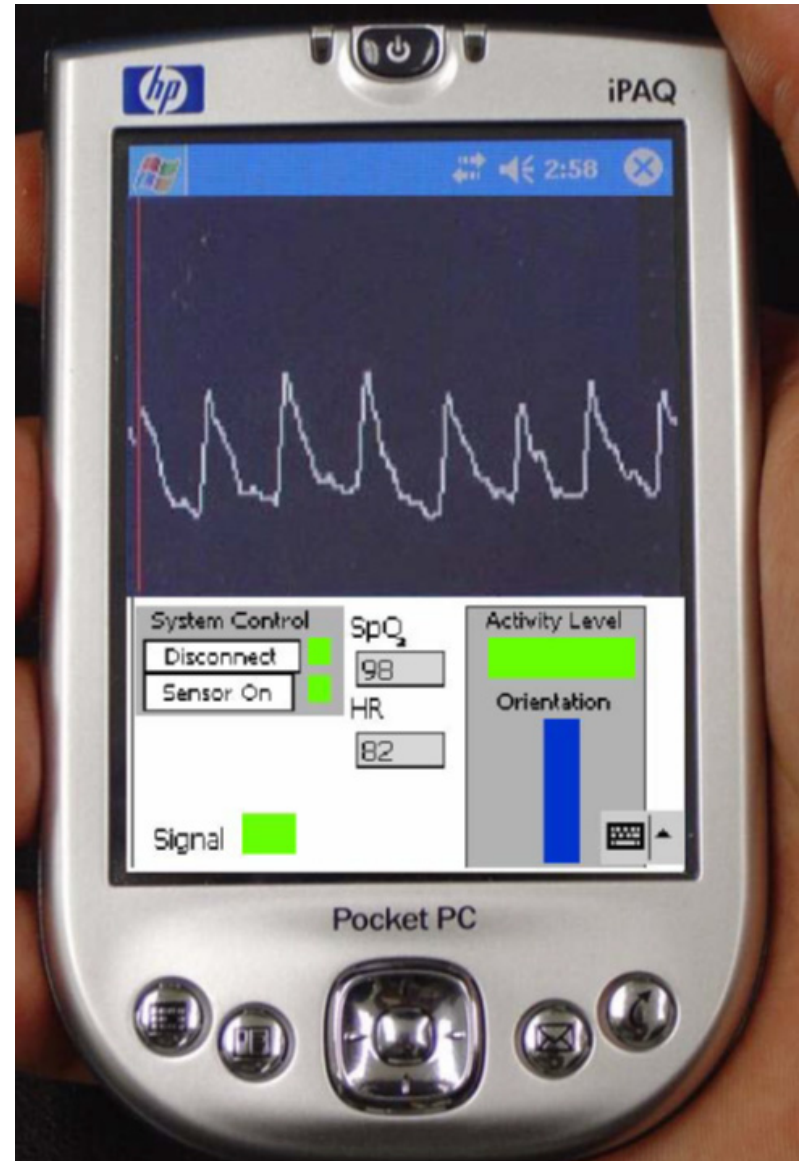


Fig. 2. System block diagram of the wearable, wireless, pulse oximeter.
Sensor Module (top), Receiver Module (bottom).

Mendelson's System

PDA: The PDA was selected based on size, weight, and power consumption. Furthermore, the ability to carry the user interface with the medic also allows for greater flexibility during deployment. We chose the HP iPAQ h4150 PDA because it can support both 802.11b and Bluetooth™ wireless communication. It contains a modest amount of storage and has sufficient computational resources for the intended application. The use of a PDA as a local terminal also provides a low-cost touch screen interface. The user-friendly touch screen of the PDA offers additional flexibility. It enables multiple controls to occupy the same physical space and the controls appear only when needed. Additionally, a touch screen reduces development cost and time, because no external hardware is required. The data from the wireless-enabled PDA can also be downloaded or streamed to a remote base station via Bluetooth or other wireless communication protocols. The PDA can also serve to temporarily store vital medical information received from the wearable unit.

A dedicated National Instruments LabVIEW program was developed to control all interactions between the PDA and the wearable unit via a graphical user interface (GUI). One part of the LabVIEW software is used to control the flow of information through the 802.11b radio system on the PDA. A number of LabVIEW VIs programs are used to establish a connection, exchange data, and close the connection between the wearable pulse oximeter and the PDA. The



Mendelson's Sensor Module outputs "one or more signals responsive to light from a light source attenuated by tissue of the user"

(Elements [1b], [13a])

“one or more signals...”

13. A computer-implemented method of informing a user of mobile measurement of oxygen saturation (“SpO2”), the computer-implemented method comprising:

outputting, from an optical sensor of an SpO2 measurement system, one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

via a processing board of the SpO2 measurement system, the processing board in data communication with the optical sensor and a mobile computing device including a display:

receiving said one or more signals from the optical sensor;

processing said one or more signals to generate the SpO2 measurement values; and

outputting the SpO2 measurement values to the mobile computing device; and

via an application configured to execute commands on the mobile computing device:

generating a graphical user interface having a plurality of display portions;

displaying, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

displaying, in a different portion of the plurality of portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application.

Mendelson's Sensor Module Outputs the Claimed "one or more signals"

consists of three units: A Sensor Module, consisting of the optical transducer, a stack of round PCBs, and a coin-cell battery. The information acquired by the Sensor Module is transmitted wirelessly via an RF link over a short range to a body-worn Receiver Module. The data processed by the Receiver Module can be transmitted wirelessly to a PDA.

Receiver Module: The Receiver Module contains an embedded microcontroller, RF transceiver for communicating with the Sensor Module, and a Universal Asynchronous Receive Transmit (UART) for connection to a PC. Signals acquired by the Sensor Module are received by the embedded microcontroller which synchronously converts the corresponding PD output to R and IR PPG signals. Dedicated software is used to filter the signals and compute SpO₂ and HR based on the relative amplitude and frequency content of the reflected PPG signals. A tri-axis MEMS

Mendelson's Sensor Module Outputs the Claimed “one or more signals”

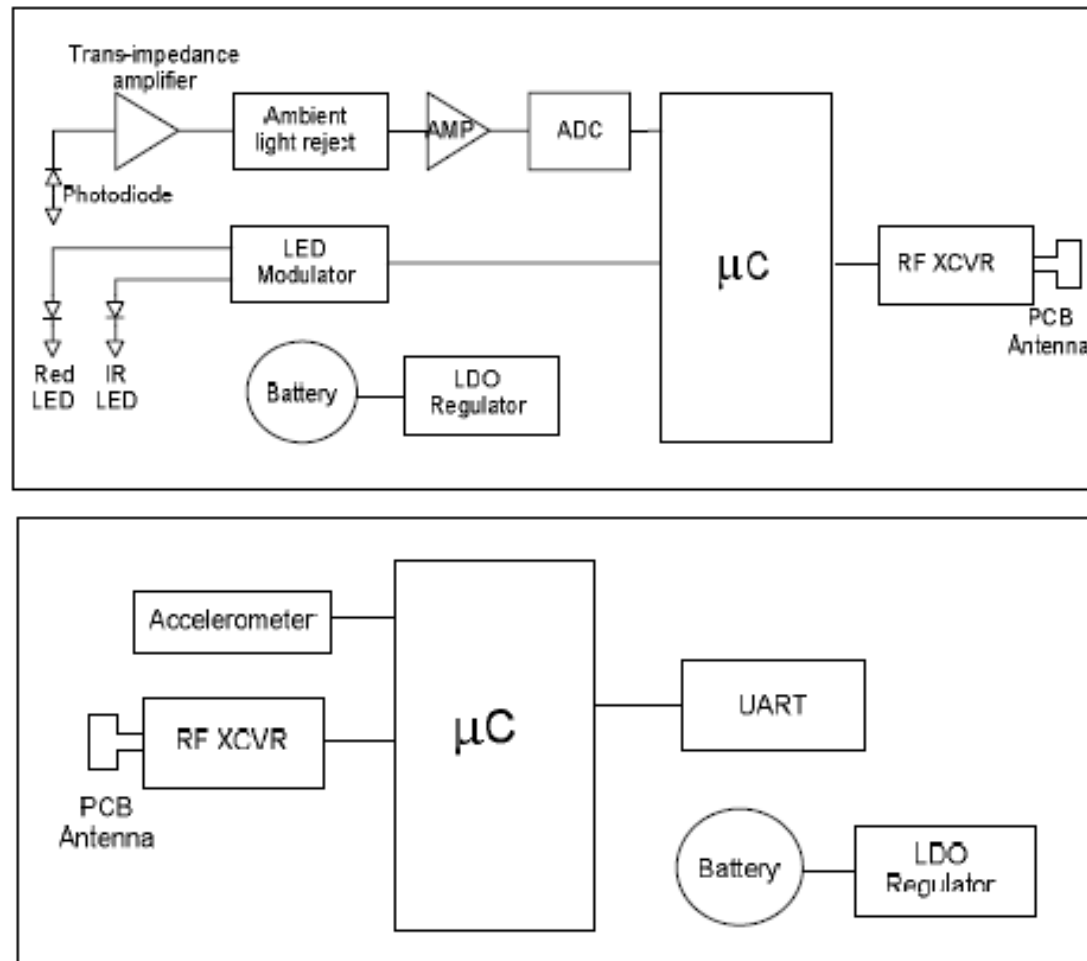


Fig. 2. System block diagram of the wearable, wireless, pulse oximeter.
Sensor Module (top), Receiver Module (bottom).

Mendelson's Sensor Module Outputs the Claimed "one or more signals"

Dr. Kenny (Petitioner's Expert):

33. It is important to remember that the claims merely recite that signals provided to the processing board be "...responsive to light from a light source attenuated by tissue." *See* Elements [1b] and [13a]. As such, under the plain and ordinary meaning of this claim language, the signals resulting from the system of Mendelson are responsive to light from a light source attenuated by tissue and captured and output by the photodiode. If this were not the case, the PDA of Mendelson would be unable to display SpO2 values that Mendelson and Duckworth report in the Mendelson paper. The effort by Masimo and Dr.

• • •

attenuated by tissue under the plain and ordinary meaning of the claims. In fact, the processing of signals such as disclosed in Mendelson would be understood as obviously intended to result in signals which are more clearly responsive to light from a light source attenuated by tissue.

“one or more signals...”

Element [13a]:

outputting, from an optical sensor of an SpO2 measurement system, one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

Petitioner:

C. Claim Construction under 37 C.F.R. §§ 42.104(b)(3)

All claim terms should be construed according to the *Phillips* standard.

Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100. Apple submits that no claim terms need be construed to resolve issues of controversy in the present Petition. See *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011).

Patent Owner:

VI. CLAIM CONSTRUCTION

The Board should give the claims their ordinary and customary meaning, consistent with the specification, as a POSITA would understand them. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*). Before the district court, Masimo explains that the claims have their plain meaning and thus require no construction. EX2029, 57-84. Masimo takes the same position here. EX2037 ¶¶89-95.

“one or more signals...”

Patent Owner:

A POSITA would have understood that the plain and ordinary meaning of “one or more signals responsive to light” output by the optical sensor refers to data that is actually acquired with the optical sensor. EX2037 ¶123. The ’507 Patent’s specification supports this understanding. *Id.* For example, the specification

Mendelson:

consists of three units: A Sensor Module, consisting of the optical transducer, a stack of round PCBs, and a coin-cell battery. The information acquired by the Sensor Module is transmitted wirelessly via an RF link over a short range to a body-worn Receiver Module. The data processed by the Receiver Module can be transmitted wirelessly to a PDA.

Receiver Module: The Receiver Module contains an embedded microcontroller, RF transceiver for communicating with the Sensor Module, and a Universal Asynchronous Receive Transmit (UART) for connection to a PC. Signals acquired by the Sensor Module are received by the embedded microcontroller which synchronously converts the corresponding PD output to R and IR PPG signals. Dedicated software is used to filter the signals and compute SpO₂ and HR based on the relative amplitude and frequency content of the reflected PPG signals. A tri-axis MEMS

POR, 18; APPLE-1011, 2;
Pet., 11; Pet. Rep., 8.

Masimo's Signal "averages" Theory

Patent Owner:

would have understood that the plain meaning of "one or more signals responsive to light" output by the optical sensor and received by the processing board refers to data actually acquired with the optical sensor. EX2037 ¶124. Conversely, the specification never teaches that the optical sensor outputs data that is not measured by the sensor such as averages of acquired data. *Id.*

As Dr. Duckworth explains, and a POSITA would have understood, Mendelson's Sensor Module does not output data actually acquired with the Sensor Module. EX2037 ¶126. Instead, the Sensor Module computes and outputs average red and infrared PPG samples to the Receiver Module.⁵ *Id.*

Accordingly, *average* red and infrared PPG samples are the only information that Mendelson's Sensor Module outputs to its Receiver Module. EX2037 ¶129. And those output average PPG samples are *not* data actually acquired with the optical sensor. *Id.* Instead, they are values computed using acquired data. *Id.* Thus,

No Support for Masimo's Signal "averages" Theory

Patent Owner:

Apple argues that the claims "make clear" that the "optical sensor outputs 'raw detected signals.'" *Id.* Specifically, Apple argues that the signal must be raw because the claim recites a "processing board" processing that signal. But Masimo's expert explained a POSA would understand it is common for sensors to perform preprocessing on signals. Masimo Ex. 13, ¶62. Apple's expert did not refute that explanation or address sensor preprocessing on a sensor at all. See Apple Ex. 33, ¶117. Apple also ignores that the claims recite "signals" that are "responsive to light from a light source attenuated by tissue of the user." Preprocessed signals are "responsive to" detected light. Masimo Ex. 45, ¶¶21-22.

Dr. Kenny (Petitioner's Expert):

scope of the claims under Masimo's claim interpretation. EX2029, 38. Masimo does not put any constraints on this "preprocessing" in the Joint Claim Construction Brief and certainly gives no examples of types of preprocessing that would fall outside of the scope of the claims. *Id.* However, in an attempt to distinguish the claims from the alleged and undisclosed "distal signal averaging" of Mendelson's Sensor Module (which, as discussed above, is not actually described anywhere in the Mendelson paper, and would not be viewed as inherently disclosed by the Mendelson paper), Masimo now draws an arbitrary line between what it appears to consider to be preprocessing that falls within the scope of the claims and preprocessing that falls outside of the scope of the claims. Specifically,

EX2029, 38;
APPLE-1083, ¶32
Pet. Rep., 14-15.

22

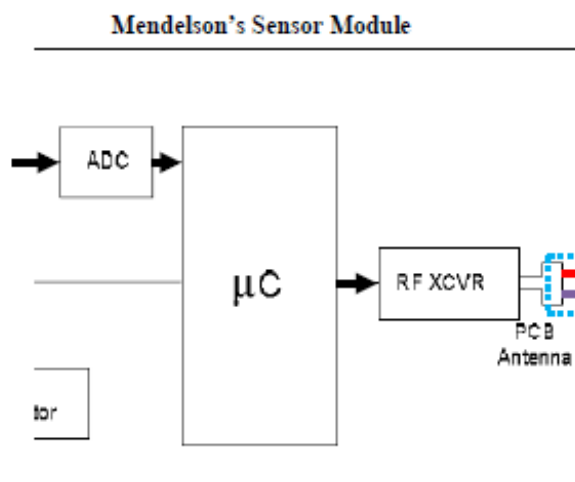
Mendelson Does Not Disclose Averaging Signals

consists of three units: A Sensor Module, consisting of the optical transducer, a stack of round PCBs, and a coin-cell battery. The information acquired by the Sensor Module is transmitted wirelessly via an RF link over a short range to a body-worn Receiver Module. The data processed by the Receiver Module can be transmitted wirelessly to a PDA.

Receiver Module: The Receiver Module contains an embedded microcontroller, RF transceiver for communicating with the Sensor Module, and a Universal Asynchronous Receive Transmit (UART) for connection to a PC. Signals acquired by the Sensor Module are received by the embedded microcontroller which synchronously converts the corresponding PD output to R and IR PPG signals. Dedicated software is used to filter the signals and compute SpO₂ and HR based on the relative amplitude and frequency content of the reflected PPG signals. A tri-axis MEMS

Mendelson Does Not Disclose Averaging Signals

POR:



No Support For This Annotation

Avg. Red PPG Samples
+
Avg. IR PPG Samples
Transmitted to
Receiver Module

Dr. Kenny
(Petitioner's Expert):

POR, 22; Pet. Rep., 11.

necessary to implement this disclosure. I find no explicit support in the disclosure of Mendelson for Masimo's assertions that "the Sensor Module computes and outputs average red and infrared PPG samples to the Receiver Module." POR, 21. Further, a POSITA would not necessarily assume that such averaging was implicitly required in order to implement the disclosure of Mendelson, or that the particular averaging scheme that Duckworth describes in his declaration would be specifically required or even understood to be present.

23. To be clear, there is simply no disclosure in Mendelson itself of any summing or averaging of collected signals. Indeed, as I discussed in the previous section, Mendelson expressly states "Signals acquired by the Sensor Module are *received* by the embedded microcontroller [of the Receiver Module] which synchronously converts the *corresponding PD* output to R and IR PPG signals". APPLE-1011, 1-2. In fact, Dr. Duckworth admitted that the additional functionality of summing and averaging signals that he included in his declaration "is not described in the Mendelson paper." APPLE-1087, 104:3-18.

APPLE-1083, ¶¶22-23; Pet. Rep., 11-14. 24

Masimo's New “analog-to-digital conversion” Theory

Patent Owner's Sur-Reply:

*First, Apple ignores the analog signal actually acquired with Mendelson's optical sensor is not what is transmitted by Mendelson's Sensor Module or received by its Receiver Module. *Id.*; EX2037 ¶130. Mendelson's optical sensor, a photodiode, outputs an analog signal proportional to light it detects. POR, 20-21; EX1011, 2; EX2037 ¶¶125-126. But that analog signal is *never* transmitted by Mendelson's Sensor Module or received by its Receiver Module. *Id.* Instead,*

Duckworth showed Mendelson's paper does not satisfy the plain meaning of this limitation because its Sensor Module at least performs analog-to-digital conversion on the acquired signal before outputting anything. EX1087, 71:2-73:9; EX2037 ¶125-29; POR, 20-21. This failure of Mendelson is apparent from the paper itself—not any “secret knowledge” about Mendelson's system.

Masimo's New "analog-to-digital conversion" Theory Was Improperly Raised For The First Time in the Sur-Reply

Patent Owner's Sur-Reply:

*First, Apple ignores the analog signal actually acquired with Mendelson's optical sensor is not what is transmitted by Mendelson's Sensor Module or received by its Receiver Module. *Id.*; EX2037 ¶130. Mendelson's optical sensor, a photodiode, outputs an analog signal proportional to light it detects. POR, 20-21; EX1011, 2; EX2037 ¶¶125-126. But that analog signal is *never* transmitted by Mendelson's Sensor Module or received by its Receiver Module. *Id.* Instead,*

Patent Owner's Response:

A POSITA would have understood that the plain and ordinary meaning of "one or more signals responsive to light" output by the optical sensor refers to *data* *that is actually acquired* with the optical sensor. EX2037 ¶123. The '507 Patent's specification supports this understanding. *Id.* For example, the specification

Masimo's New “analog-to-digital conversion” Theory Was Improperly Raised For The First Time in the Sur-Reply

Patent Owner's Response:

outputs the measured values to the mobile device. *Id.*, 4:65-5:14. The mobile device contains “software applications for managing the data and sensor.” *Id.*, 10:43-46. These applications can display the measurement values on the mobile device and provide a user interface for interacting with the application. *Id.*, 10:35-46. The '507 Patent explains that the processing module can comprise one or more processing boards that perform the functions of the module, such as an analog processing board and a digital processing board. *Id.*, FIG. 1C, 9:1-6, 9:62-65.

Masimo's New "analog-to-digital conversion" Theory Was Improperly Raised For The First Time in the Sur-Reply

Patent Owner's Response:

EX1011, 2; EX2037 ¶125. The Sensor Module has a "photodiode" that outputs a signal responsive to the detected light. *Id.* The photodiode signal is amplified ("Trans-impedance amplifier"), filtered to remove ambient light ("ambient light reject" signal conditioning), amplified again ("AMP"), converted from analog to digital by an "ADC," and received by a microcontroller ("µC"). *Id.* The microcontroller processes the signal and provides the resulting information to the RF transceiver ("RF XCVR"). *Id.* The RF transceiver then processes that information into packets that are transmitted to, and received by, Mendelson's Receiver Module. *Id.*

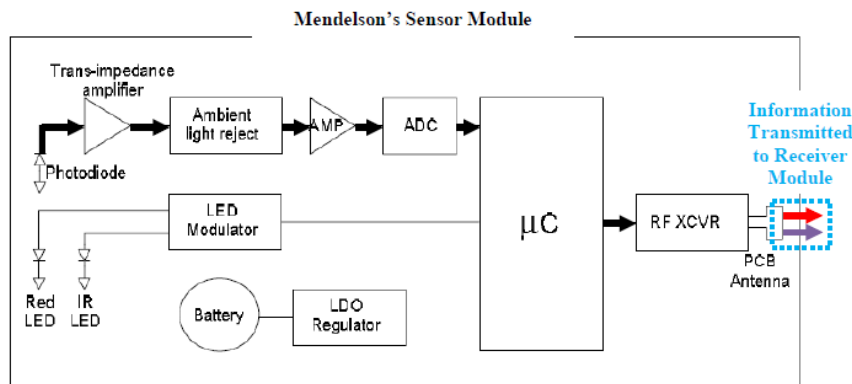
As Dr. Duckworth explains, and a POSITA would have understood, Mendelson's Sensor Module does not output data actually acquired with the Sensor Module. EX2037 ¶126. Instead, the Sensor Module computes and outputs average red and infrared PPG samples to the Receiver Module.⁵ *Id.*

Masimo's New "analog-to-digital conversion" Theory Was Improperly Raised For The First Time in the Sur-Reply

Patent Owner's Response:

New arbitrary line drawn by Masimo in the Sur-Reply

Mendelson fails to disclose outputting "one or more signals responsive to light," under the plain meaning of that phrase. EX2037 ¶125. The below diagram of Mendelson's Sensor Module (the alleged "optical sensor") illustrates what happens between its photodiode outputting a detected signal (left) and information being transmitted to the Receiver Module (right).



EX1011, 2; EX2037 ¶125. The Sensor Module has a "photodiode" that outputs a signal responsive to the detected light. *Id.* The photodiode signal is amplified ("Trans-impedance amplifier"), filtered to remove ambient light ("ambient light reject" signal conditioning), amplified again ("AMP"), converted from analog to digital by an "ADC," and received by a microcontroller ("µC"). *Id.* The microcontroller processes the signal and provides the resulting information to the RF transceiver ("RF XCVR"). *Id.* The RF transceiver then processes that information into packets that are transmitted to, and received by, Mendelson's Receiver Module. *Id.*

Masimo's New Claim Construction Theory Should Be Properly Disregarded

***Caterpillar Inc. v. Wirtgen America, Inc.*, IPR2022-01278, Paper 34 at 43-44 (PTAB Feb. 6, 2024)**

Patent Owner makes a number of new claim construction arguments in its Sur-reply without any attempt to justify the failure to include them in the Patent Owner Response. See PO Sur-reply 11–15. Under these circumstances, we do not consider the new arguments. See Paper 13, 9

***Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1330 (Fed. Cir. 2019)**

We conclude that the Board did not abuse its discretion in holding HPC to its word and disregarding its new theory first raised in reply.

***Ford Motor Company v. Safe Driving Technologies LLC*, IPR2022-00086, Paper 25 at 37 (PTAB May 15, 2023)**

In its Sur-Reply, Patent Owner's raises for the first time a new argument that claims 11, 13, 43, and 44 "all specify a *sensed parameter* being outside a threshold as the basis for modifying an output, not only the condition itself." Sur-Reply 10. This argument could have and should have been raised in Patent Owner's Response. Because Patent Owner first raised this argument in the Sur-Reply, Patent Owner prevented Petitioner from addressing it. Thus, as explained in further detail below, we grant Petitioner's Motion to Strike this new, untimely argument. Paper 19.

Dr. Duckworth's Testimony Does Not Support Masimo's New Theory

The '507 Patent:

As illustrated, some embodiments can optionally include a second processing board 136. For example, the first processing board 134 can be a digital processing board and the second processing board 136 can be an analog processing board. The analog and digital processing boards may perform separate processing functions. In some embodiments, wires from the first cable 120 can be connected to the analog processing board 136, and wires from the second cable 140 can be connected to the digital processing board 136. In some embodiments, the digital processing board can be in communication with the first information element 133. The first information element 133 can be an EPROM or EEPROM device. The analog processing board can be in communication with a second information element 137 coupled to cable 120. The second information element 127 can be a resistor, in some embodiments, for example an ArCal or ProCal resistor. A resistance value of the resistor can be indicative of a wavelength of light used in an oximetry sensor 110 coupled to the cable 120, and the resistor can be coupled in parallel with the sensor.

ration. Although described herein primarily with respect to digital technology, a processor can also include primarily analog components. For example, any of the signal processing algorithms described herein can be implemented in analog circuitry. A computing environment can include any type of computer system, including, but not limited to, a computer system based on a microprocessor, a mainframe computer, a digital signal processor, a portable computing device, a personal organizer, a device controller, and a computational engine within an appliance, to name a few.

Dr. Duckworth's Testimony Does Not Support Masimo's New Theory

Patent Owner's Sur-Reply:

signal actually acquired with its photodiode. EX2037 ¶125; EX1011, 2. He explained that after analog-to-digital conversion, the data "would no longer be the data actually acquired with the optical sensor" and thus "fall[s] outside of the scope of one or more signals responsive to light." EX1087, 71:2-73:9. Therefore,

Dr. Duckworth (Patent Owner's Expert):

Q. Is that signal from the trans-impedance amplifier to the ambient light reject data that is actually acquired by Mendelson's photodiode?

A. No, because now we have started going through processing steps. The only data that is acquired by the photodiode is that left -- top left arrow that we are talking about before.

Apple Properly Relies Upon Masimo's District Court Claim Construction

***Western Digital Corp. v. SPEX Techs., Inc.*, IPR2018-00084, Paper 14 at 10-11 (PTAB April 25, 2018)**

We agree with Petitioner that 37 C.F.R. § 104(b)(3) does not require Petitioner to express its subjective agreement regarding correctness of its proffered claim constructions or to take ownership of those constructions. Petitioner complies with our rules by identifying claim constructions it proposes as the basis for requesting review of the challenged claims. Petitioner's statement that its Petition "is based on the claim constructions urged by Patent Owner" in related District Court litigation (Pet. 8 (emphasis added)) suffices to identify claim constructions Petitioner is adopting for purposes of the requested review in compliance with § 104(b)(3).

***Apple Inc. v. CPC Patent Techs. Pty, Ltd.*, IPR2022-00601, Paper 11 at 12-14 (PTAB Sept. 28, 2022)**

claims. Pet. 6–8. Petitioner asserts its proposed constructions are consistent with constructions made by the district court in the related litigation between the parties (*see* Ex. 1077), constructions agreed to by the parties in the related litigation (*see* Ex. 1079), or constructions proposed by Patent Owner in the related litigation (*see* Ex. 1073).⁷

• • •

Based on the record before us, we adopt, for purposes of this Decision, Petitioner's unopposed proposed claim constructions. "[W]e need

***Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001)**

HN9 Only when a claim is properly understood can a determination be made whether the claim "reads on" an accused device or method, or whether the prior art anticipates and/or renders obvious the claimed invention. *See id.* Because the claims of a patent measure the invention at issue, the claims must be interpreted and given the same meaning for purposes of both validity and infringement analyses. *See SmithKline Diagnostics, Inc. v. Helena Labs. Corp.*, 859 F.2d 878, 882, 8 U.S.P.Q.2D (BNA) 1468, 1471 (Fed. Cir. 1988). "A patent may not, like a 'nose of wax,' be twisted one way to avoid anticipation and another to find infringement." *Sternier Lighting, Inc. v. Allied Elec. Supply, Inc.*, 431 F.2d 539, 544 (5th Cir. 1970) [**17] (citing *White v. Dunbar*, 119 U.S. 47, 51, 30 L. Ed. 303, 7 S. Ct. 72 (1886)). The court must properly interpret the claims, because an improper claim construction may distort the infringement and validity analyses. *See Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 450, 230 U.S.P.Q. (BNA) 416, 421 (Fed. Cir. 1986).

***Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1360 (Fed. Cir. 2017)**

"It follows that we should apply the doctrine in IPR proceedings before the PTO. Extending the prosecution disclaimer doctrine to IPR proceedings will ensure that claims are not argued one way in order to maintain their patentability and in a different way against accused infringers."

Pet. Rep., 6, 16; Pet., 11. 33

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

D'Angelo Is Prior Art to the '507 Patent

D'Angelo Is Prior Art to the '507 Patent

(12) **United States Patent**
Muhsin et al.

(10) **Patent No.:** US 10,736,507 B2
(45) **Date of Patent:** Aug. 11, 2020

(54) **PHYSIOLOGICAL MONITOR WITH MOBILE COMPUTING DEVICE CONNECTIVITY**

(71) **Applicant:** MASIMO CORPORATION, Irvine, CA (US)

(72) **Inventors:** Bilal Muhsin, Aliso Viejo, CA (US); Sujin Hwang, Rancho Santa Margarita, CA (US); Benjamin C. Triman, Rancho Santa Margarita, CA (US)

(73) **Assignee:** Masimo Corporation, Irvine, CA (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 day(s).

(21) **Appl. No.:** 15/880,071

(22) **Filed:** Jan. 25, 2018

(65) **Prior Publication Data**
US 2019/000017 A1 Jan. 3, 2019

Related U.S. Application Data

(63) Continuation of application No. 14/033,315, filed on Sep. 20, 2013, now Pat. No. 9,877,650.

(60) Provisional application No. 61/703,729, filed on Sep. 20, 2012.

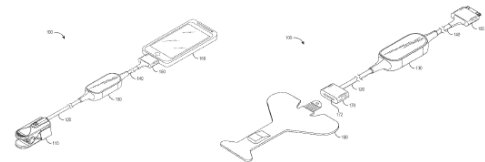
Related U.S. Application Data

(63) Continuation of application No. 14/033,315, filed on Sep. 20, 2013, now Pat. No. 9,877,650.

(60) Provisional application No. 61/703,729, filed on Sep. 20, 2012.

(51) **Int. Cl.**
A61B 5/455 (2006.01)
A61B 5/0476 (2006.01)
A61B 5/0402 (2006.01)
A61B 5/0205 (2006.01)
A61B 5/00 (2006.01)
A61B 7/00 (2006.01)

20 Claims, 15 Drawing Sheets



33rd Annual International Conference of the IEEE EMBS
Boston, Massachusetts USA, August 30 - September 3, 2011

33rd Annual International Conference of the IEEE EMBS
Boston, Massachusetts USA, August 30 - September 3, 2011

A Sensor Network to iPhone Interface separating Continuous and Sporadic Processes in Mobile Telemedicine

Lorenzo T. D'Angelo, Michael Schneider, Paul Neugebauer and Tim C. Lueh, Member, IEEE

Abstract—In this contribution, a new concept for interfacing sensor network nodes (motes) and smartphones is presented for the first time. In the last years, a variety of telemedicine applications on smartphones for data reception, display and transmission have been developed. However, it is not always practical or possible to force a smartphone application running continuously to accomplish these tasks. The presented system allows receiving and storing data continuously using a mote and visualizing/sending it on the go using the smartphone as user interface only when desired. Thus, the processes of data reception and storage run on a safe system consuming less energy and the smartphone's potential along with its battery are not demanded continuously. Both system concept and realization with an Apple iPhone are presented.

efficiency and security. After a state of the art overview about mobile systems for telemedicine and a task description, the concept will be described and a prototypical implementation will be shown.

A. State of the art in mobile systems for telemedicine.

Within the fitness and monitoring of chronic illnesses domains there are many commercial products able to monitor specific vital parameters over the day, e.g. chest straps and sport watches for heart rate, long term electrocardiogram (ECG) or blood pressure monitoring as well as glucose monitoring. Most of these products do not interface smartphones and do not enable mobile uploading of recorded data to a server.

In research, many projects focus on mobile acquisition, processing and transmission of vital parameters through personal health management systems (PHMS) enabling telemedicine and e-health solutions. Among those are AMON, MORHEART, WEALTHY and MYHEART, to name a few [3]. In WEALTHY, various vital parameter sensors are embedded into garments. Data acquisition, processing and transmission takes place in specifically designed electronics. There is no direct visual feedback for the user [4]. The device has been improved in the Healthcare project [5]. In MYHEART, a mobile system able to send an ECG using a PDA phone over the internet is presented [6]. In [7], a mobile phone based system with direct user feedback is presented. The system also allows data transmission on a server using the scalable Healthcare Integrated Platform (SHIP). A wearable body sensor network interfacing a PDA phone for data upload is presented in [8]. A Smart Personal Health Manager interfacing a Body Area Network with a PDA phone in order to instantly show acquired data is presented in [9]. A similar system using a WLAN infrastructure inside a hospital instead of Bluetooth is presented in [10].

Several groups also work on acquiring behavioral information rather than vital parameters. Activity Recorders and Transceivers are sensor nodes capable of detecting and storing information about interaction [11]. One example is the Eventlogger presented in [12] which uses radio modules to detect interactions with objects. In [13], a platform for acquisition and display of vital parameters measured by body-worn or car-embedded sensor is presented.

An overview of the presented systems and their main characteristics is given in Table I.

Summing up, most presented systems can be distinguished between systems transmitting acquired data

978-1-4244-4122-8/11/\$26.00 ©2011 IEEE

1528

APPLE-1082, ¶11-7; Pet. Rep., 1-2. 35

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

D'Angelo Is Prior Art to the '507 Patent

**Gordon
MacPherson:**



DECLARATION OF GORDON MACPHERSON

I, Gordon MacPherson, am over twenty-one (21) years of age. I have never been convicted of a felony, and I am fully competent to make this declaration. I declare the following to be true to the best of my knowledge, information, and belief:

1. I am the Director, Board Governance & Policy Development at The Institute of Electrical and Electronics Engineers, Incorporated ("IEEE").
2. IEEE is a neutral third party in this dispute.
3. I am not being compensated for this declaration and IEEE is only being reimbursed for the cost of the article I am certifying.
4. Among my responsibilities as Director of Board Governance & Policy Development, I act as a custodian of certain records for IEEE.
5. I make this declaration based on my personal knowledge and information contained in the business records of IEEE.
6. As part of its ordinary course of business, IEEE publishes and makes available technical articles and standards. These publications are made available for public download through the IEEE digital library, IEEE Xplore.
7. It is the regular practice of IEEE to publish articles and other writings including article abstracts and make them available to the public through IEEE Xplore. IEEE maintains copies of publications in the ordinary course of its regularly conducted activities.

D'Angelo Is Prior Art to the '507 Patent

Gordon
MacPherson:

8. The article below has been attached as Exhibit A to this declaration:

Exhibit A	L. T. D'Angelo, M. Schneider, P. Neugebauer and T. C. Lueth, "A sensor network to iPhone interface separating continuous and sporadic processes in mobile telemedicine," <i>2011 Annual International Conference of the IEEE Engineering in Medicine and Biology Society</i> , Boston, MA, USA, 2011, pp. 1528-1531, doi: 10.1109/IEMBS.2011.6090368.
-----------	---

9. I obtained a copy of Exhibit A through IEEE Xplore, where it is maintained in the ordinary course of IEEE's business. Exhibit A is a true and correct copy of the Exhibit, as it existed on or about October 17, 2024.
10. The article and abstract from IEEE Xplore show the date of publication. IEEE Xplore populates this information using the metadata associated with the publication.
11. L. T. D'Angelo, M. Schneider, P. Neugebauer and T. C. Lueth, "A sensor network to iPhone Interface separating Continuous and Sporadic Processes in Mobile Telemedicine," was published in the 33rd Annual International Conference of the IEEE EMBS Boston, Massachusetts, USA, held on August 30-September 3, 2011. Copies of the conference proceedings were made available no later than the last day of conference. This article is currently available for public download from the IEEE digital library, IEEE Xplore.
12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

I declare under penalty of perjury that the foregoing statements are true and correct.

Date: 10/18/2024

Signed by:

By: 845214E4A5C0470...

D'Angelo Is Prior Art to the '507 Patent

June Munford:

22. “A Sensor Network to iPhone Interface Separating Continuous and Sporadic Processes in Mobile Telemedicine” was published in the 33rd edition of *Proceedings of the IEEE EMBS Annual International Conference*. This paper was presented at the 2011 edition of the IEEE EMBS Annual International Conference and Appendix DANGELO02 indicates this conference held from August 30, 2011 – September 3 2011. As multiple universities were collecting new editions of *Proceedings of the IEEE EMBS Annual International Conference* as of September 2011, it is my determination that “A Wearable Reflectance Pulse Oximeter for Remote Physiological Monitoring” was first made available to the public at the 2011 IEEE EMBS Annual International Conference and was shortly after made available to the public from the Ohio State University, Syracuse University and University of Michigan among others via the conference proceedings.

D'Angelo Is Prior Art to the '507 Patent

Dr. Kenny:

114. D'Angelo is a paper that was presented at the 33rd IEEE EMBS Annual International Conference in Boston, MA and published in the collected proceedings of the conference. The conference took place from August 30th to September 3, 2011. I was (and still am) a member of IEEE during the relevant time frame. As I described above with respect to the Mendelson reference, I know from my personal experience as both an IEEE member and as a regular attendee of various IEEE conferences that practitioners interested in the area of engineering in medicine and biology (which includes the subfield of physiological monitoring) would have been aware of and attended conferences such as the annual IEEE EMBS International Conference. Furthermore IEEE members would have had

D'Angelo Is Prior Art to the '507 Patent

***Medtronic Inc., v. Barry*, 891 F.3d 1368 (Fed. Cir. 2018) (discussing *Mass. Inst. of Tech. v. AB Fortia*, 774 F.2d 1104, 1108-09 (Fed. Cir. 1985))**

For example, in *Massachusetts Institute of Technology v. AB Fortia (MIT)*, a paper that was orally presented at a conference to a group of cell culturists interested in the subject matter was considered a "printed publication." 774 F.2d 1104, 1109 (Fed. Cir. 1985). In that case, between 50 and 500 persons having ordinary skill in the art were told of the existence of the paper and informed of its contents by the oral presentation. *Id.* at 1109. We took note that the document itself was disseminated without restriction to at least six persons. *Id.* at 1108-09. Thus, whether the copies were freely distributed to interested members of the public was a key consideration in our analysis.

***Medtronic Inc., v. Barry*, 891 F.3d 1368 (Fed. Cir. 2018) (discussing *In re Carol F. Klopfenstein and John L. Brent, Jr.*, Slip Op. No. 03-1583 (Fed. Cir. August 18, 2004))**

In re Klopfenstein is also instructive in its identification of the relevant factors. 380 F.3d 1345 (Fed. Cir. 2004). The reference in dispute in that case was a printed slide presentation that was displayed prominently for three days at a conference to a wide variety of participants. *Id.* at 1350. The reference was shown with no stated expectation that the information would not be copied or reproduced by those viewing it. *Id.* But copies were never distributed to the public and never indexed. *Id.* Under such a scenario, we identified HN5 the relevant factors to include: (1) "the length of time the display was exhibited," (2) "the expertise of the target audience" (to determine [***1218] how easily those [**26] who [*1382] viewed the material could retain the information), (3) "the existence (or lack thereof) of reasonable expectations that the material displayed would not be copied," and (4) "the simplicity or ease with which the material displayed could have been copied." *Id.* After reviewing these factors, we determined that the reference was sufficiently publicly accessible to count as a "printed publication" for the purposes of § 102(b). *Id.* at 1352.

***Weber, Inc. v. Provisur Techs., Inc.*, 92 F.4th 1059, 1067-68 (Fed. Cir. 2024)**

HN5 Where, as here, "a publication's purpose is [*1068] 'dialogue with the intended audience,' that purpose indicates public accessibility." *Valve*, 8 F.4th at 1374 (citation omitted).

D'Angelo Is Prior Art to the '507 Patent

Gordon MacPherson:

11 A. The date of publication for an IEEE
12 conference paper would recognize as the first day
13 that the -- that the content was made available to
14 an interested audience.

15 So our business rule is that we
16 recognize the first day of the conference as the
17 publication date, and we recognize the last day of
18 the conference as the last reasonable date at which
19 those proceedings would have been typically made
20 available to the attendees.

21 Generally they were given to attendees
22 the first day of the conference. We consider that a

1 best practice. There are some rare cases where they
2 would be held until the last day of the conference.

Ex. 2057 (19:1-21:2)

7 Q. Based on your 17 years of experience
8 at IEEE, do you have any reason to believe that the
9 2011 IEEE publications were not provided by at least
10 the last day of the conference?

11 A. I don't have good reason to believe
12 that this would represent an exception.

13 Q. Based on all your years of experience,
14 do you have any reason to believe that the D'Angelo
15 paper, Exhibit A in your declaration, was not
16 provided by the last day of the 2011 annual
17 conference?

18 A. I don't have any reason to believe
19 it -- or I don't have a reasonable doubt about it.

Ex. 2057 (32:7-33:2)

11 Q. Is it more likely than not the
12 D'Angelo reference was made available on the last
13 day of the 2011 annual conference as it is IEEE's
14 normal and ordinary course of business?

15 MR. OLDHAM: Objection; leading, lacks
16 foundation, calls for speculation.

17 THE WITNESS: Yes.

Ex. 2057 (33:11-34:3); Observations (Paper 59), 1-2.

41

Patent Owner Has Failed To Establish an Earlier Date of Invention

Patent Owner Has Failed To Establish an Earlier Date of Invention

Patent Owner's Response:

B. D'Angelo Is Not Prior Art

D'Angelo became publicly available on December 1, 2011, *less than one year* before the '507 Patent's effective filing date. *Supra* §VIII.A. Thus, D'Angelo is not § 102(b) prior art. At most, D'Angelo might qualify as § 102(a) art. But, here, the claimed inventions were reduced to practice before the reference date of D'Angelo.

And indeed, the inventions recited in the independent Claims 1 and 13 were reduced to practice by August 31, 2011. EX2037 ¶¶41-88. Thus, D'Angelo, which published months later in December 2011, is also not § 102(a) prior art.

Accordingly, D'Angelo is not prior art. Because Apple's Grounds 1D and 2D rely on D'Angelo (Pet. 1-2), both grounds of unpatentability fail.⁶

Patent Owner Has Failed To Establish an Earlier Date of Invention

Parus Holdings, Inc. v. Google LLC, 70 F.4th 1365, 1370-72 (Fed. Cir., 2023)

The Board declined to consider Parus's arguments and evidence that the challenged patents were conceived and reduced to practice prior to Kovatch's priority date because it found that Parus had failed to comply with 37 C.F.R. § 42.6(a)(3), which prohibits incorporation by reference. Specifically, the Board found that

Patent Owner has not presented its arguments regarding prior conception and reduction to practice in its Response or Sur-reply; rather, Patent Owner presents its arguments in several declarations and improperly incorporates those arguments by reference into its Response and Sur-reply, in violation of Rule 42.6(a)(3).

Decision, J.A. 16. The Board [**5] noted that Parus did not provide any "meaningful explanation in the Response," *id.* at J.A. 13, did "not cite [] any [] evidence or testimony with specificity," *id.* at 13-14, and did "not explain the basis for [its] conclusion or cite [] any evidence to support it," *id.* at 14. The Board therefore concluded that Parus had failed to meet its burden of production and that Kovach was prior art to the challenged patents.

As we explained in *General Access*, there are compelling reasons why these USPTO regulations exist. In that case, as here, the patent owner attempted to incorporate by reference a lengthy claim chart allegedly evidencing conception of the challenged claims. *General Access*, 811 F. App'x at 656 n.1. We upheld the Board's decision finding that the conclusory assertions in the Patent Owner Response were insufficient to meet the Patent Owner's burden of establishing prior conception. *Id.* at 658. HN6 In so doing, we found that the "prohibition against incorporation of arguments from other

archaeologist with the record."). The burden of production cannot be met without some combination of citing the relevant record evidence with specificity and explaining the significance of the produced material in briefs. Here, Parus did neither.

Patent Owner Has Failed To Establish an Earlier Date of Invention

***Parus Holdings, Inc. v. Google LLC*, 70 F.4th 1365,
1370-72 (Fed. Cir., 2023)**

And Parus was not without recourse. Parus had almost 3,000 unused words in its Patent Owner Response. J.A. 1355.

[*1373] Moreover, if Parus had needed more room to explain its position, it could have sought leave to exceed its word count under 37 C.F.R. § 42.24(a)(2) or reallocated more of its briefs to that argument. Parus chose not to use the avenues available to it.

Because we do not find the Board's decision to disregard Parus's alleged evidence and argument of antedating to be a violation of the APA or any other provision of law, we affirm the Board's holding that Kovatch qualifies as prior art to the challenged patents under 35 U.S.C. § 103(a). Because Parus does not otherwise challenge the Board's holding of obviousness based on Kovatch in combination with other references, we likewise affirm the Board's holding that Appellees demonstrated by a preponderance of the evidence that claims 1, 2, 4-7, 9, 10, 13, and 14 of the '431 patent are unpatentable.

***Blackberry Corp. v. Mobilemedia Ideas LLC*, Case No IPR2013-00016, Paper
No. 32 at 21 (PTAB Feb. 25, 2014)**

At the outset, MobileMedia's arguments attempt to incorporate by reference Dr. Madisetti's testimony (Ex. 2001 ¶¶ 68-132), but incorporation of arguments from one document into another is prohibited by 37 C.F.R. § 42.6(a)(3). MobileMedia's attempt to incorporate Dr. Madisetti's testimony also violates the page limit set forth in 37 C.F.R. § 42.24(a)(1)(v). *Cf. Globespanvirata, Inc. v. Tex. Instruments, Inc.*, 2005 WL 3077915,

Pet. Rep., 3-4. 45

Patent Owner Has Failed To Establish an Earlier Date of Invention

1. A mobile pulse oximetry system for informing a user of mobile measurement of oxygen saturation ("SpO2"), the mobile pulse oximetry system comprising:

an SpO2 measurement system including:

an optical sensor configured to output one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

a processing board in data communication with the optical sensor and a mobile computing device including a display and cellular communication, wherein the processing board is configured to: receive said one or more signals from the optical sensor;

process said one or more signals to generate SpO2 measurement values; and

output the SpO2 measurement values to the mobile computing device; and

one or more hardware processors of the mobile computing device configured to execute an application, the application configured to execute commands to:

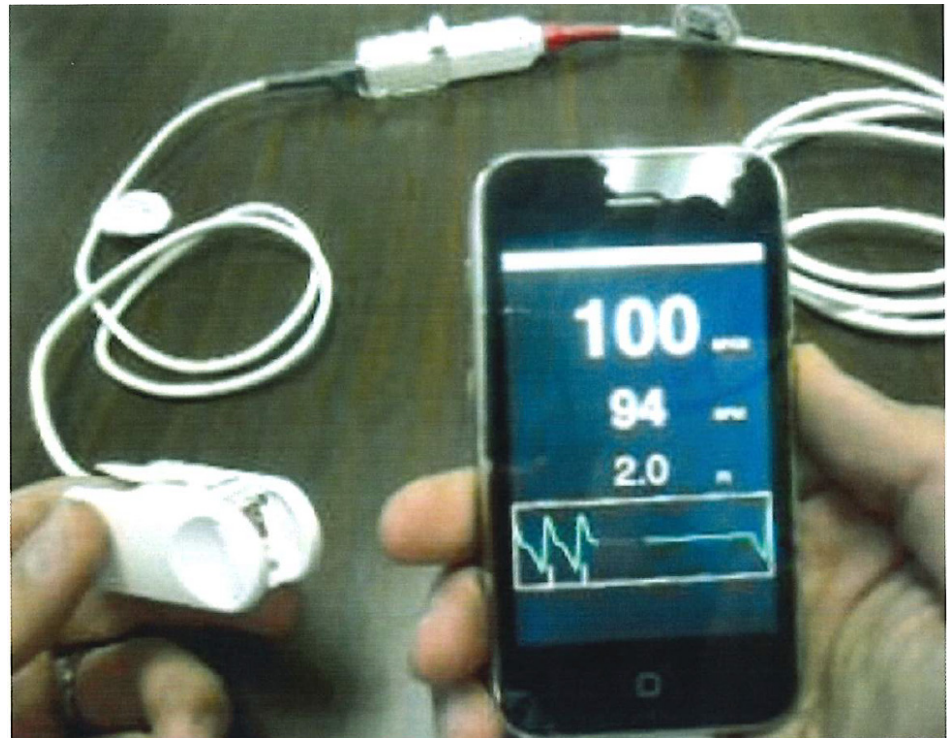
generate a graphical user interface having a plurality of display portions;

display, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

display, in a different portion of the plurality of display portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application;

wherein the processing of the one or more signals to generate SpO2 measurement values is performed only on the processing board, thereby freeing up memory available to the mobile computing device; and

wherein the processing board is configured to draw power for operation from the mobile computing device.



Patent Owner Has Failed To Establish an Earlier Date of Invention

***Kolcraft Enters. v. Graco Children's Prods.*, 927 F.3d 1320, 1324 (Fed. Cir., 2019)**

HN1 Inventor testimony of conception must be corroborated by other, independent information. *Apator Miitors ApS v. Kamstrup A/S*, 887 F.3d 1293, 1295 (Fed. Cir. 2018) (citing *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996); *Hahn v. Wong*, 892 F.2d 1028, 1032-33 (Fed. Cir. 1989)). Whether there is sufficient corroboration is governed by a "rule of reason" analysis, which requires all pertinent evidence to be examined to determine whether the inventor's testimony is credible. *In re NTP, Inc.*, 654 F.3d 1279, 1291 (Fed. Cir. 2011); *Kridl v. McCormick*, 105 F.3d 1446, 1450 (Fed. Cir. 1997).

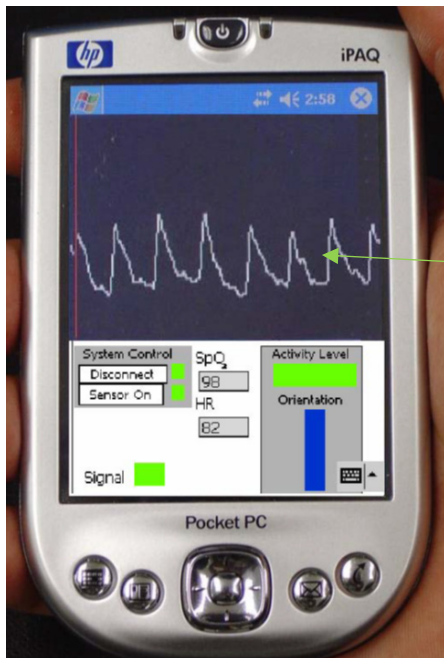
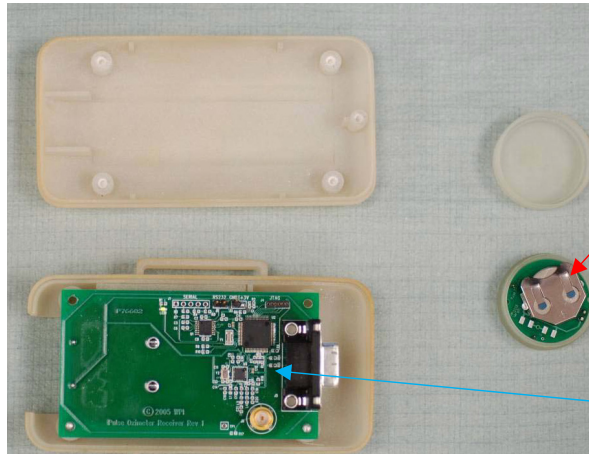
***Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996)**

HN10 This court has developed a rule requiring corroboration where a party seeks to show conception through the oral testimony of an inventor. *Price*, 988 F.2d at 1195. This requirement arose out of a concern that inventors testifying in patent infringement cases would be tempted to remember facts favorable to their case by the lure of protecting their patent or defeating another's patent. *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U.S. 45, 60, 67 L. Ed. 523, 43 S. Ct. 322 (1923); accord *Deering v. Winona Harvester Works*, 155 U.S. [**11] 286, 300-01, 39 L. Ed. 153, 15 S. Ct. 118 (1894); *The Barbed Wire Patent*, 143 U.S. 275, 284-85, 36 L. Ed. 154, 12 S. Ct. 443 (1892); *Gasser Chair Co. v. Infanti Chair Mfg. Corp.*, 60 F.3d 770, 776, 34 U.S.P.Q.2D (BNA) 1822, 1826 (Fed. Cir. 1995); *New Idea Farm Equip. Corp. v. Sperry Corp.*, 916 F.2d 1561, 1567, 16 U.S.P.Q.2D (BNA) 1424, 1430 (Fed. Cir. 1990). While perhaps prophylactic in application given the unique abilities of trial court judges and juries to assess credibility, the rule provides a bright line for both district courts and the PTO to follow in addressing the difficult issues related to invention dates.

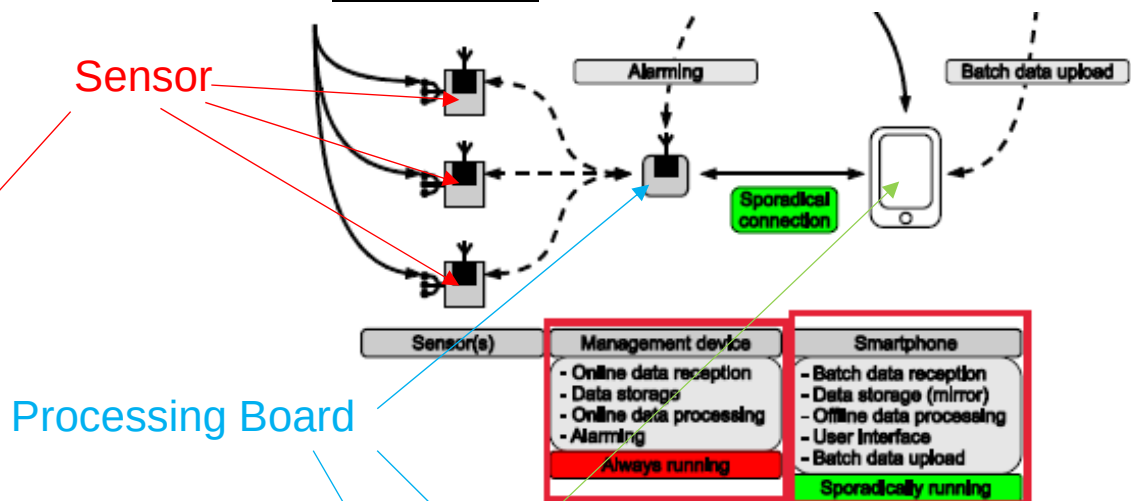
A POSITA Would Have Been Prompted to
Combine Mendelson and D'Angelo

A POSITA Would Have Been Prompted to Combine Mendelson and D'Angelo

Mendelson:



D'Angelo:



APPLE-1011, 2-3; APPLE-1007, 1529-1530; Pet. 8, 10, 12, 37-38. 49

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

A POSITA Would Have Been Prompted to Combine Mendelson and D'Angelo

D'Angelo:

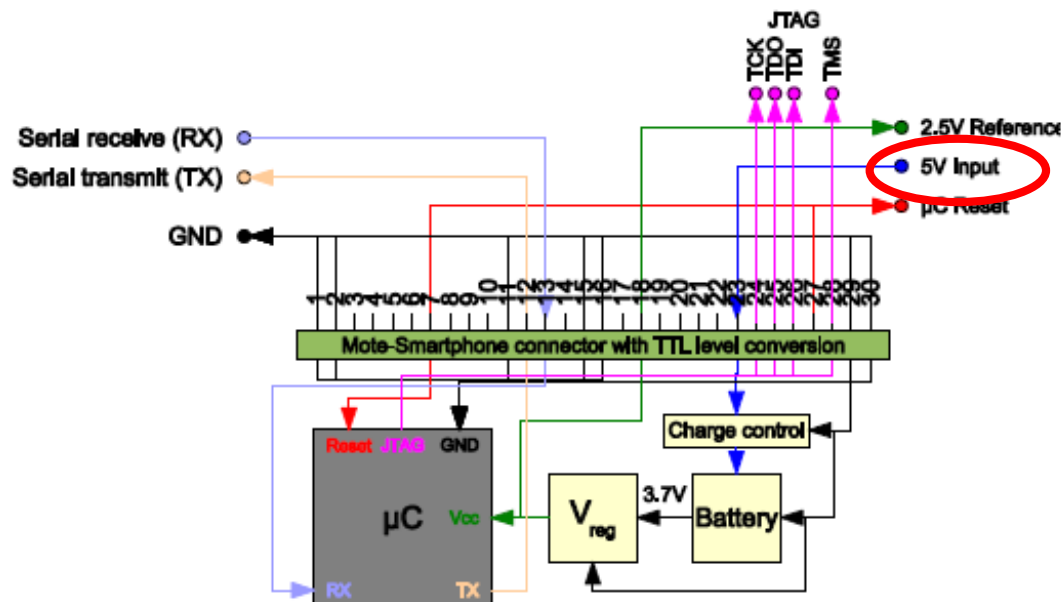


Fig. 3 Pin assignment of the mote-smartphone connector.

management device. The second addition is a connection between the smartphone's power output pin and the management device's charging pin, allowing to read out the management device with the smartphone even when its battery is empty. A system overview is given in Fig. 2. A third addition, namely a GSM module, is needed to cover all functions according to the presented concept. However, the presented prototype focuses on demonstrating the interface between the management device and the smartphone.

A POSITA Would Have Been Prompted to Combine Mendelson and D'Angelo

Dr. Kenny:

124. As a third reason, a POSITA would have recognized that applying D'Angelo's teachings to Mendelson's physiological monitoring system to configure Mendelson's Receiver Module (the processing board) to be able to draw power from the smartphone in at least some scenarios would have provided the additional and beneficial functionality for the measured physiological data to be read from the Receiver Module "even when its battery is empty." APPLE-1007, 1530. Such a modification to Mendelson's systems based on the straightforward teachings of D'Angelo would have provided crucial backup functionality for collecting important physiological data, including SpO₂ readings, even in scenarios in which the Receiver Module of Mendelson has lost power, which could facilitate potentially lifesaving interventions based on the physiological data read from the Receiver Module.

A POSITA Would Have Been Prompted to Combine Mendelson and D'Angelo

Dr. Kenny:

128. As a seventh reason, a POSITA would have been prompted to implement Mendelson's physiological parameter monitoring system to implement Mendelson's PDA as a smartphone, to include a configuration that allows Mendelson's Receiver Module (equivalent to D'Angelo's management device) to draw power from the smartphone in at least some scenarios, and to include various user interface screens for displaying physiological data and receiving user input as described by D'Angelo in addition to or in place of the user interface screens described by Mendelson (all features suggested by D'Angelo) because doing so would be merely the application of a known technique to a known system (e.g., Mendelson's physiological monitoring system) ready for improvement to yield predictable results. Here, D'Angelo provides straightforward evidence of known techniques for implementing a PDA as a smartphone, powering a processing board from the smartphone, and providing additional user interface screens for a physiological data monitoring system and Mendelson's teaching provides a known system that would have been improved by application of D'Angelo's suggested techniques for at least the reasons described above (§§122-127).

APPLE-1003, ¶128; Pet. 43.

52

Mendelson's System is Not Limited to Combat Use

Mendelson:

STEADY advances in noninvasive physiological sensing, hardware miniaturization, and wireless communication are leading to the development of new wearable technologies that have broad and important implications for civilian and military applications [1]-[2]. For example, the emerging development of compact, low-power, small-size, light-weight, and unobtrusive wearable devices may facilitate remote noninvasive monitoring of vital signs from soldiers during training exercises and combat. Telemetry of

in order to expedite rescue operations. Having wearable physiological monitoring could offer far-forward medics numerous advantages, including the ability to determine a casualty's condition remotely without exposing the first responders to increased risks, quickly identifying the severity of injuries especially when the injured are greatly dispersed over large geographical terrains and often out-of-site, and continuously tracking the injured condition until they arrive safely at a medical care facility.

Pulse oximetry was initially intended for in-hospital use on patients undergoing or recovering from surgery. During the past few years, several companies have developed smaller pulse oximeters, some including data transmission via telemetry, to further expand the applications of pulse oximetry. For example, battery-operated pulse oximeters are now attached to patients during emergency transport as they are being moved from a remote location to a hospital, or between hospital wards. Some companies are also offering smaller units with improved electronic filtering of noisy PPG signals.

physiological signs. Wireless physiological information can be useful to monitor soldiers during training exercises and combat missions, and help emergency first-responders operating in harsh and hazardous environments. Similarly, wearable physiological devices could become critical in helping to save lives following a civilian mass casualty. The

Mendelson's System is Not Limited to Combat Use

Dr. Kenny:

APPLE-1011, 2. A POSITA would have recognized that medical personnel would be in close physical proximity to such patients during transport and that medical personnel would not have been in danger from such close proximity to the patient.

I note that Mendelson includes disclosure that expressly describes scenarios in which "medical personnel" are in close physical proximity to casualties in combat zones to "distribute sensors," presumably after the immediate threat has ended.

APPLE-1011, 3. Numerous other non-hazardous scenarios in which it would have posed little or no risk to the medic to be in close proximity to the person wearing the Sensor Module and Receiver Module would have been readily recognized by a POSITA. As such, a POSITA would have recognized that such non-hazardous scenarios would have benefited from use of Mendelson's mobile monitoring system as modified by D'Angelo. Simply put, a POSITA would have recognized

Masimo Identifies Possible Tradeoffs and Alternative Solutions, Not Teaching Away

PAR Pharm., Inc. v. TWI Pharms., Inc., 773 F.3d 1186, 1197-98 (Fed. Cir. 2014)

HN8 Our precedent, however, [***1954] does not require that [*1198] the motivation be the *best* option, only that it be a *suitable* option from which the prior art did not teach away. See *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013); *Bayer Healthcare Pharms., Inc. v. Watson Pharms., Inc.*, 713 F.3d 1369, 1376 (Fed. Cir. 2013). There is no question, based on the disclosures [**27] in the prior art, that the NanoCrystal technology presented a suitable option for reducing interpatient variability and viscosity in megestrol formulations.

Galderma Labs., L.P. v. Tolmar, Inc., 737 F.3d 731, 738 (Fed. Cir. 2013)

HN4 A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. A reference does not teach away, however, if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed.

Pet. Rep., 19.55

Masimo Identifies Possible Tradeoffs and Alternative Solutions, Not Teaching Away

***L-3 Communs. Corp. v. Sony Corp.*, 2014 U.S. Dist.
LEXIS 127643, *13 (D. Del. 2014)**

applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). However, the presence of tradeoffs does not constitute a teaching away. "[A] finding that the prior art as a whole suggests the desirability of a particular [*15] combination need not be supported by a finding that the prior art suggests that the combination claimed ... is the preferred, or most desirable, combination." *Bayer Healthcare Pharm., Inc. v. Watson Pharm., Inc.*, 713 F.3d 1369, 1376 (Fed. Cir. 2013) (citing *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004)). Here, the prior art clearly equated image intensifiers with in-pixel amplifiers. That there were tradeoffs does not make the combination non-obvious. I find that a

***Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d
1373, 1381 (Fed. Cir. 2016)**

551, 553 (Fed. Cir. 1994). Contrary to Allied's contention [**18] that the PTAB incorrectly relied on Ogawa because its precise structure (i.e., two separate hydraulic cylinders) is criticized by Caterpillar, the disadvantage underscored by Caterpillar does not militate against finding the combination proper. Caterpillar expresses doubt as to whether an *optimal* design feature may have the main pivot pin for both jaws also mount the jaws to the frame in order to effect the quick change functionality. See J.A. 133

A POSITA Would Not Have Been Dissuaded From Using The Smartphone for Backup Power

Dr. Kenny:

in the manner I described in my First Declaration. EX2037, ¶146. For one reason, such a solution would have required the medic to carry this additional “ordinary medical equipment” in addition to the PDA/smartphone. Dr. Duckworth’s assertion also overlooks that “ordinary medical equipment” typically requires 120V power sources such as in a hospital where such ordinary medical equipment is typically used, and that typical or “ordinary medical equipment” is generally heavy, and inconvenient to use outside of the typical medical situation, and may not be designed to operate in the environment of such situations. As another reason, this solution proposed by Dr. Duckworth also would have required using the same equipment on multiple different casualties. Such cross use of medical

A POSITA Would Not Have Been Dissuaded From Using The Smartphone for Backup Power

Dr. Kenny:

42. Dr. Duckworth also suggests that rather than powering the Receiver Module with the PDA/smartphone for the brief amount of time required to receive vital sign readings from the Receiver Module, a POSITA would have instead recommended that “the medic would have just replaced the Receiver Module’s AA batteries.” EX2037, ¶146. However, this proposed alternative solution would have required the medic to carry a potentially large amount of AA batteries on their person, and to execute disassembly, battery extraction and insertion, and reassembly, under battlefield or other stressful conditions. And, as mentioned above, at most, the solution represented by the Mendelson-D’Angelo combination would have been an alternative solution to the problem of a Receiver Module with a depleted battery. The fact that other possible solutions existed would not have dissuaded a POSITA from implementing the straightforward solution to such scenarios described by D’Angelo.

The Claims Do Not Require Reading Out Stored Data

1. A mobile pulse oximetry system for informing a user of mobile measurement of oxygen saturation ("SpO2"), the mobile pulse oximetry system comprising:

an SpO2 measurement system including:

an optical sensor configured to output one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

a processing board in data communication with the optical sensor and a mobile computing device including a display and cellular communication, wherein the processing board is configured to:

receive said one or more signals from the optical sensor;

process said one or more signals to generate SpO2 measurement values; and

output the SpO2 measurement values to the mobile computing device; and

one or more hardware processors of the mobile computing device configured to execute an application, the application configured to execute commands to:

generate a graphical user interface having a plurality of display portions;

display, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

display, in a different portion of the plurality of display portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application;

wherein the processing of the one or more signals to generate SpO2 measurement values is performed only on the processing board, thereby freeing up memory available to the mobile computing device; and

wherein the processing board is configured to draw power for operation from the mobile computing device.

13. A computer-implemented method of informing a user of mobile measurement of oxygen saturation ("SpO2"), the computer-implemented method comprising:

outputting, from an optical sensor of an SpO2 measurement system, one or more signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more signals responsive to an oxygen saturation of said tissue; and

via a processing board of the SpO2 measurement system, the processing board in data communication with the optical sensor and a mobile computing device including a display:

receiving said one or more signals from the optical sensor;

processing said one or more signals to generate the SpO2 measurement values; and

outputting the SpO2 measurement values to the mobile computing device; and

via an application configured to execute commands on the mobile computing device:

generating a graphical user interface having a plurality of display portions;

displaying, in at least one portion of the plurality of display portions, a representation of a physiological parameter of a plurality of physiological parameters comprising at least the SpO2 measurement values; and

displaying, in a different portion of the plurality of portions, a plurality of user inputs configured to allow the user to interact with at least one of the plurality of display portions or the application.

The Claims Do Not Require Reading Out Stored Data

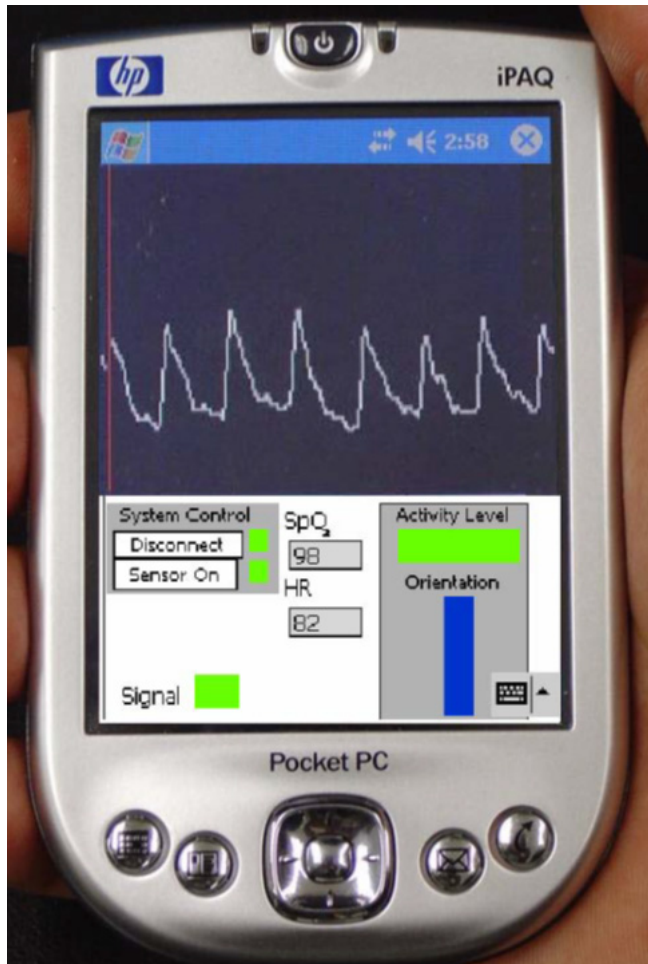
Dr. Kenny:

is being supplied. EX2044, 56:2-9. A POSITA would have been aware that receiving the necessary vital sign data to make important triage decisions regarding a patient would have been able to be performed in a quick amount of time. As such, as I previously stated in my deposition, “I think a person of ordinary skill in the art would consider modifying Mendelson so that the power connection from the PDA to the receiver module could allow download of physiological data, and that that would include data that's been stored, *as well as the current flow of data.*”

Id., 55:15-20. As such, Dr. Duckworth’s assertion that “Mendelson does not

Mendelson's Unmodified System Monitors Only One Patient at a Time

Mendelson:

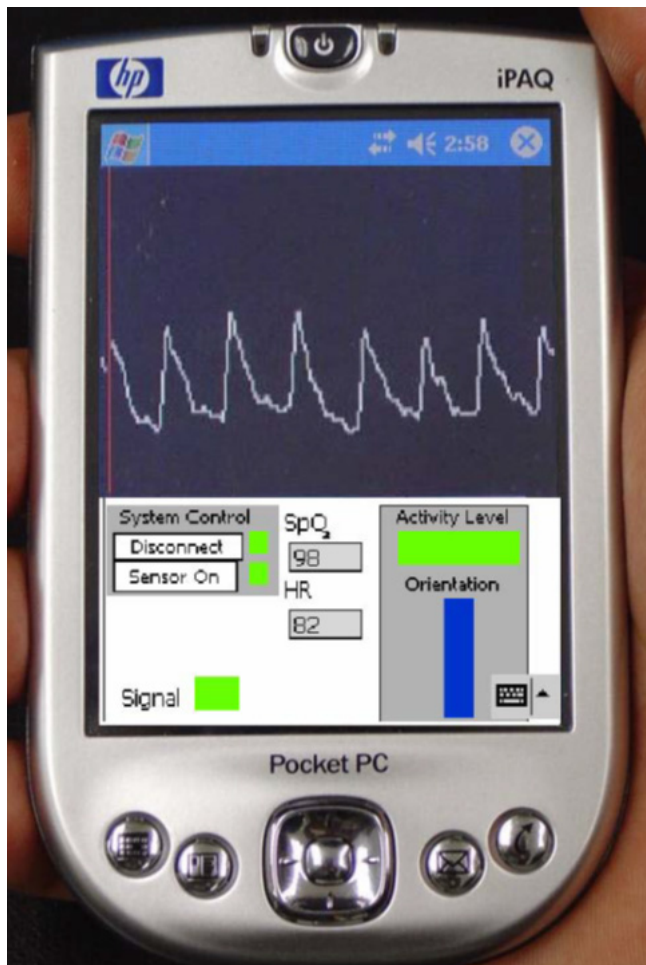


functions. In cases of multiple wearable devices, it also allows the user to select which individual to monitor prior to initiating the wireless connection. Once a specific wearable unit is selected, the user connects to the remote device via the System Control panel that manages the connection and sensor control buttons. The GUI also displays the subject's vital signs, activity level, body orientation, and a scrollable PPG waveform that is transmitted by the wearable device.

The stream of data received from the wearable unit is distributed to various locations on the PDA's graphical display. The most prominent portion of the GUI display is

Mendelson's Unmodified System Monitors Only One Patient at a Time

Dr. Kenny:



47. Turning to the actual disclosures of Mendelson, the paper describes that that the medic or other person in possession of the PDA must select “*a specific wearable unit*” and “connect[] to *the* remote device” to view “the subject’s vital signs.” APPLE-1011, 3. In other words, Mendelson’s PDA functions by connecting to a single Receiver Module at a time. Furthermore, as shown in Figure 3, the user interface of the PDA displays only information for a single user at a time (i.e., the user wearing the Receiver Module that the PDA has connected to at the time). Specifically, Figure 3 shows a PPG waveform, SpO₂ and Heartrate values, activity level, orientation, and on-screen controls for a single user/Receiver Module.

Masimo's Proposed Alternative Solution Would Have Been Costly

Dr. Kenny:

49. However, such an alternative solution would have required ensuring that every Receiver Module had full batteries before every use event, including unexpected emergencies. To implement this proposed alternative solution presented by Dr. Duckworth, the person or persons in charge of maintaining the system would have needed to replace the batteries of each Receiver Module prior to the battery being fully depleted to ensure that the battery would not become depleted during training, combat, or another use scenario. This alternative solution would have resulted in significant waste as batteries would need to be replaced long before being depleted to ensure viability. And, as mentioned above, at most, this would have been an alternative solution to the problem of a Receiver Module with a depleted battery. The fact that other possible solutions existed would not have dissuaded a POSITA from implementing the straightforward solution to such scenarios described by D'Angelo.

Masimo's Proposed Alternative Solution Would Have Been Costly

Dr. Kenny:

51. Finally, Duckworth's proposal to make sure that all such systems are fully-charged prior to use overlooks all scenarios where unexpected events and circumstances extend the situation beyond the life of fully-charged batteries. As a POSITA would appreciate, as well as anyone using battery-powered hand-held devices at the time of the '507, it is not unusual for everyday situations to lead to a need for back-up power. In the cases of systems intended for use in the battlefield or other hazardous scenarios, there should be an even greater appreciation that things will not go as planned, and back-ups are wise and useful.

PDA/Smartphones Had Sufficient Battery Capacity to Provide Backup Power

Dr. Kenny:

battery capacity of the PDA/smartphone. A POSITA would have known that by the late timeframe of 2012, smartphones and other PDAs generally had a “long battery life” and substantially large batteries sufficient for powering all of the functions of the cellphone and therefore would have had more than enough power to provide brief, backup power to a Receiver Module with a depleted battery.

APPLE-1094, 8; APPLE-1097, 6.

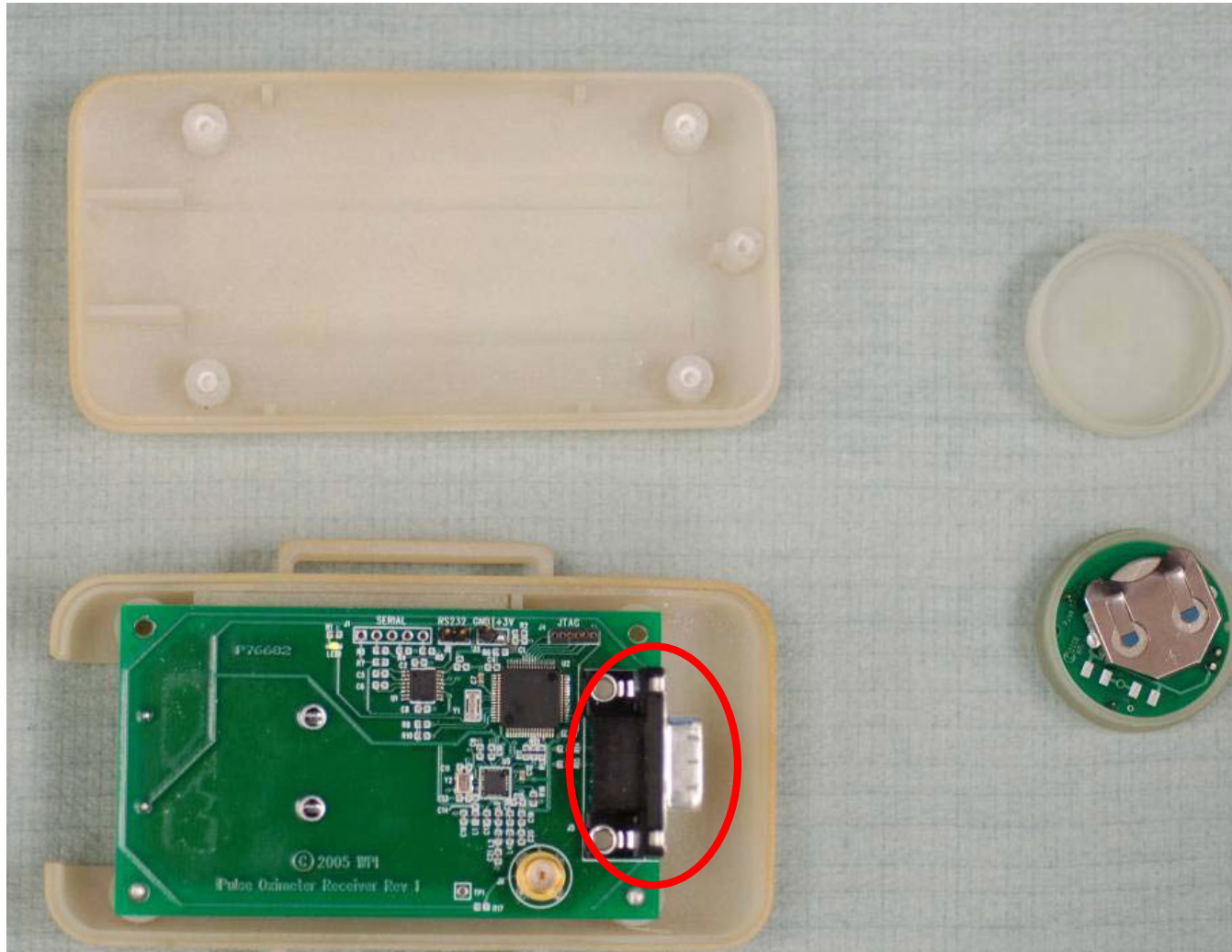
PDAs/Smartphones Had Sufficient Battery Capacity to Provide Backup Power

Dr. Kenny:

53. Additionally, a POSITA would have recognized that applying D'Angelo's teachings to Mendelson's system would have merely provided medics and other users of the PDA with the *option* to provide backup power to a Receiver Module with a depleted battery. The medic or other user of the PDA would not have been forced to utilize the PDA to provide backup power to the Receiver Module in every scenario. The medic or other user of the PDA would simply have the option and could choose to use the added, backup power functionality depending on the current charge level of the PDA and other relevant factors of a given scenario, such as the degree to which the person wearing the Receiver Module is injured. A POSITA would have recognized that a skilled medic would have had the knowledge and experience to use such discretion wisely and would have benefited from the additional backup power functionality described by D'Angelo in at least some scenarios.

Mendelson's Receiver Module Already Includes a Port for Connecting to the PDA/Smartphone

Mendelson:



D'Angelo's Device is Compact

D'Angelo:



A POSITA Would Have Been Prompted to
Combine Mendelson and D'Angelo with
Goldsmith

Smartwatches Had Sufficient Battery Capacity to Provide Backup Power

Goldsmith:

[0052] FIG. 8 shows an electronics architecture according to an embodiment of the invention with a custom integrated circuit ("custom IC") 558 as the processor. This architecture can support many of the devices discussed herein, for example the controller device, the infusion device, the characteristic determining device, a BG meter, or any combination of the above. The custom IC 558 is in communication with a memory 566, keypad 565, audio devices 564 (such as speakers or audio electronic circuitry such as voice recognition, synthesis or other audio reproduction), and a display 560. Where there is a drive mechanism in a device that includes infusion functions, the custom IC 558 is in communication with a motor 552 or motor drive circuitry or other means of delivering fluids or therapy via an electro-mechanical means. Where there are one more sensors included in the device, or in communication with the device (such as a characteristic determining device or a device which includes a characteristic determining function), the custom IC 558 is in communication with the sensors 580.

device 450. Optional peripheral devices may include a physiological characteristic sensor device, such as a telemonitored glucose monitoring system (TGMS) sensor. Alternatively, the sensor may be directly wired to a monitor/user interface. The TGMS sensor or physiological characteristic sensor 486 may provide for continuous BG monitoring. The physiological characteristic sensor 486 may also be linked to a bedside monitor 492 so that monitoring and programming of medication delivery may be performed remotely. In some embodiments, the infusion pump device does not include, nor need, a display. In this embodiment, a key fob may serve as a remote display. Other options for a remote display include, but are not limited to, cellular telephones, computer monitors, PDA's, smart phones, watch remotes, and the like.

[0041] The power of the controller device and of the other various devices discussed herein may be provided from a battery. The battery may be a single use or a rechargeable battery. Where the battery is rechargeable, there may be a

design. In certain embodiments, the electronics architecture includes a removable battery and an internal backup battery.

Revised Motion to Amend

Revised Claim 21

21. (Substitute for claim 13, if that claim is found unpatentable). A computer-implemented method of informing a user of mobile measurement of oxygen saturation (“SpO2”), the computer-implemented method comprising:

outputting, from an optical sensor of an SpO2 measurement system, one or more analog signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more analog signals responsive to an oxygen saturation of said tissue; and

via a processing board of the SpO2 measurement system, the processing board in data communication with the optical sensor and a smartphone mobile computing device including a touch-sensitive smartphone display:

receiving through a wired connection said one or more analog signals from the optical sensor;

processing said one or more analog signals to generate the SpO2 measurement values and heart rate; and

wirelessly outputting the SPO2 measurement values and heart rate to the smartphone mobile computing device; and

via an application configured to execute commands on the smartphone mobile computing device:

generating a graphical user interface having a plurality of display portions on the touch-sensitive smartphone display;

displaying, in at least one portion of the plurality of display portions at one or more times, a representation of a physiological parameter of a plurality of physiological parameters comprising the SpO2 measurement values;

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;

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;

displaying, in at least one portion of the plurality of display portions at one or more times, a graphical representation of a heart; and

displaying, in a different portion of the plurality of portions, a plurality of user inputs configured to allow the user to use the touch-sensitive smartphone display to interact with at least one of the plurality of display portions or the application;

wherein the computer-implemented method is configurable to authenticate user data access by using at least one of fingerprint, facial, and voice recognition technologies;

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 the openings such that the perimeter lip surrounds at least a portion of perimeter sides of the upper and lower shells;

the light from the light source comprises at least red and infrared light; and

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.

Revised Claims 22-24

22. (Substitute for claim 14, if that claim is found unpatentable). The mobile pulse oximetry system of claim [[13]]21, further comprising, via the application:

perform a trend analysis on received SpO₂ measurement values; and

display results of the trend analysis in at least one portion of the plurality of display portions;

wherein the processing said one or more analog signals comprises applying an advanced signal processing algorithm with data filtering.

23. (Substitute for claim 17, if that claim is found unpatentable). The computer-implemented method of claim [[13]]21, 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;

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;

wherein the sensor and processing board are provided together with a wrist-mounted device.

24. (Substitute for claim 19, if that claim is found unpatentable). The computer-implemented method of claim [[13]]21, wherein the protective assembly is configured to protect sensitive circuitry of the processing board from water damage ~~further comprising wirelessly transmitting the SpO₂ measurement values from the SpO₂ measurement system to the mobile computing device.~~

Revised Claims 22-23

22. (Substitute for claim 14, if that claim is found unpatentable). The mobile pulse oximetry system of claim [[13]]21, further comprising, via the application:

perform a trend analysis on received SpO₂ measurement values; and

display results of the trend analysis in at least one portion of the plurality of display portions;

wherein the processing said one or more analog signals comprises applying an advanced signal processing algorithm with data filtering.

23. (Substitute for claim 17, if that claim is found unpatentable). The computer-implemented method of claim [[13]]21, 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;

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;

wherein the sensor and processing board are provided together with a wrist-mounted device.

Grounds in Opposition to rMTA

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

Masimo's Proposed Substitute Claims Lack Written Description Support

Masimo Fails To Identify Support for the Proposed Claim Amendments

NeuroDerm Ltd. v. AbbVie Inc., PGR2022-00040,
Paper 77 at 15 (PTAB Oct. 31, 2023)

Importantly, we note that Patent Owner fails to explain how the material cited in the claim chart supports the claims. *See* Mot. 15–16. Instead, Patent Owner provides only a claim chart with bare citations, leaving it to the panel to discern how the cited material supports the claim limitations. *See id.* Patent Owner’s failure to explain the citations constitutes a fatal error, as we have reviewed the passages cited by Patent Owner and are unable to discern where support is found for several of the substitute claim limitations. Where, as here, “the Board is unable to determine how the specification and drawings support the proposed substitute claims, the motion to amend may be denied.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“TPG”),⁶ 71.

Opp. (Paper 52), 1; Sur-Reply to RMTA (Paper 58), 1.

Masimo Fails To Identify Support for the Proposed Claim Amendments

PEAG LLC v. Varta Microbattery GMBH, IPR2020-01213, Paper 26, 6 (PTAB July 21, 2021)

substitute limitations.” 2016 WL 6803057, at *7. Here, Patent Owner provides citations to specific paragraphs and figures of the '117 application for each annotated claim element of each proposed substitute claim. See Mot. 10–11. In *Intel Corp. v. Alacritech Inc.*, which we note is not binding authority, the Board found that “Patent Owner provides the same string citations for all of the elements of substitute claim 23.” IPR2017-01391, Paper 8, at *44. In this case, Patent Owner provides different citations for each different element of the claims. See Mot. 10–11.

Sur-Reply to RMTA (Paper 58), 2; Reply to Opp. to RMTA (Paper 53), 2.

***B.E. Tech., L.L.C. v. Google, Inc.*, 2016 WL 6803057
at *7 (Fed. Cir. Nov. 17, 2016)**

We agree with the Board that B.E. did not meet its burden to show written description support for the proposed substitute limitations. ... B.E. only provided a string citation to eighteen different pages of the '314 patent's original specification, without explaining how those various pages supported each of the proposed substitute limitations.

Sur-Reply to RMTA (Paper 58), 2. 78

Masimo Fails To Identify Support for the Proposed Claim Amendments

Intel Corp. v. Alacritech Inc., IPR2017-01391, Paper 81 at 43
(PTAB Nov. 26, 2018) (citing *Respironics, Inc. v. Zoll Med. Corp.*,
IPR2013-00322, Paper 46 at 24 (PTAB Sept. 17, 2014))

Owner contends that each citation of the string citations is sufficient to disclose the corresponding element. In that regard, Patent Owner provides the same string citations for all of the elements of substitute claim 23. It is not the responsibility of the Board to search through the string citations to find sufficient written description support for each element and we decline Patent Owner's invitation to do so. *See Respironics*, 2014 WL 4715644, at *13 ("Zoll's string citations amount to little more than an invitation to us (and to Respironics, and to the public) to peruse the cited evidence and piece together a coherent argument for them. This we will not do; it is the province of advocacy.").⁸

Sur-Reply to RMTA (Paper 58), 2.

Masimo Fails To Identify Support for the Proposed Claim Amendments

Revised Motion to Amend:

Written Description Support Examples for Amended Features			
Claim	<u>EX2045</u> Original Disclosure of '507 Patent	<u>EX2046</u> Provisional App. No. 61/703,729 (Filed Sept. 20, 2012)	<u>EX2047</u> Non-Provisional App. No. 14/033,315 (Filed Sept. 20, 2013)
21	[0003], [0006], [0008], [0023], [0025]–[0030], [0032]–[0034], [0036], [0038], [0045]–[0047], [0051], [0061]–[0062], [0065]; FIGS 1–4D	Pages 1–10, 12– 13; FIGS 1–3	[0003], [0006], [0008], [0023], [0025]–[0030], [0032]–[0034], [0036], [0038], [0045]–[0047], [0051], [0061]–[0062], [0065]; FIGS 1–4D
22	[0006], [0027], [0032], [0047], [0093], Abst., FIG 4A–C	Pages 2, 7, 10, 13, FIG 3	[0006], [0027], [0032], [0047], [0093], Abst., FIG 4A–C
23	[0006]–[0008], [0023], [0038], [0040], [0048], [0051], [0074]; FIGS 1A–3	Pages 2, 6–7, FIGS 1–3	[0006]–[0008], [0023], [0038], [0040], [0048], [0051], [0074]; FIGS 1A–3
24	[0038], [0043]; FIGS 1A–1C	Page 6; FIGS 1–2	[0038], [0043]; FIGS 1A–1C

Masimo Fails To Identify Support for the Proposed Claim Amendments

Revised Motion to Amend:

Original Cl. No.	Substitute Cl. No.	Amendments (no substitute claims have broadening amendments)
13	21	- the signals output from the optical sensor are "analog" signals - the processing board is in data communication with a "smartphone" having a "touch-sensitive smartphone" display - the processing board receives "through a wired connection" one or more "analog" signals - the processing board processes the signals to generate the SpO2 measurement values "and heart rate" - the SpO2 measurement values "and heart rate" are "wirelessly" output to the "smartphone" mobile computing device - the application is configured to execute commands on the "smartphone" mobile computing device
		- the application generates the graphical user interface "on the touch-sensitive smartphone display" - the application displays SpO2 measurement values "at one or more times" - the application "at one or more times" displays "graph of a history of the SpO2 measurement values" - the application "at one or more times" displays "a graph of a history of the heart rate" - the application "at one or more times" displays "a graphical representation of a heart" - the plurality of user inputs are configured to allow the user to "use the touch-sensitive smartphone display" - the "computer-implemented method is configurable to authenticate user data access by using at least one of fingerprint, facial, and voice recognition technologies" "the processing board" is "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 the openings such that the perimeter lip surrounds at least a portion of perimeter sides of the upper and lower shells" "the light from the light source comprises at least red and infrared light" "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"

Written Description Support Examples for Amended Features			
Claim	EX2045 Original Disclosure of '507 Patent	EX2046 Provisional App. No. 61/703,729 (Filed Sept. 20, 2012)	EX2047 Non-Provisional App. No. 14/033,315 (Filed Sept. 20, 2013)
21	[0003], [0006], [0008], [0023], [0025]–[0030], [0032]–[0034], [0036], [0038], [0045]–[0047], [0051], [0061]–[0062], [0065]; FIGS 1–4D	Pages 1–10, 12–13; FIGS 1–3	[0003], [0006], [0008], [0023], [0025]–[0030], [0032]–[0034], [0036], [0038], [0045]–[0047], [0051], [0061]–[0062], [0065]; FIGS 1–4D
22	[0006], [0027], [0032], [0047], [0093], Abst., FIG 4A–C	Pages 2, 7, 10, 13, FIG 3	[0006], [0027], [0032], [0047], [0093], Abst., FIG 4A–C
23	[0006]–[0008], [0023], [0038], [0040], [0048], [0051], [0074]; FIGS 1A–3	Pages 2, 6–7, FIGS 1–3	[0006]–[0008], [0023], [0038], [0040], [0048], [0051], [0074]; FIGS 1A–3
24	[0038], [0043]; FIGS 1A–1C	Page 6; FIGS 1–2	[0038], [0043]; FIGS 1A–1C

Masimo Fails To Identify Support for the Proposed Claim Amendments

Ariad Pharms., Inc. v. Eli Lilly and Co., 598 F.3d 1336, 1351-52 (Fed. Cir. 2010) (en banc)

935 F.2d 1555, 1562-63 (Fed. Cir. 1991). Specifically, the description must "clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed." *Id.* at 1563 (citing *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989)). In other words, the test for sufficiency [****42**] is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. *Id.* (quoting *Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985)); see also *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983).

In re Huston, 308 F.3d 1267 (Fed. Cir. 2002)

HN3 "Entitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed. It extends only to that which is disclosed." *Lockwood*, 107 F.3d at 1571-72, 41 USPQ2d at 1966. Huston's

Element [21n] Lacks Written Description Support

Revised Motion to Amend (Element [21n]):

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 the openings such that the perimeter lip surrounds at least a portion of perimeter sides of the upper and lower shells;

'507 Patent Original Disclosure:



Element [21n] Lacks Written Description Support

Masimo's Expert:

18 Do you believe that the inner ledge
19 for the lower opening is depicted in Figure 1C?

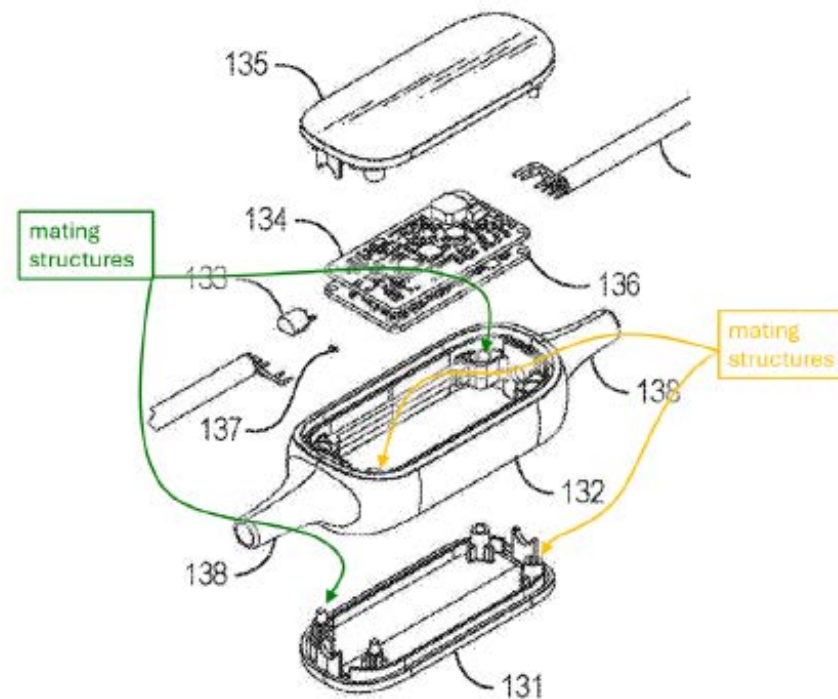
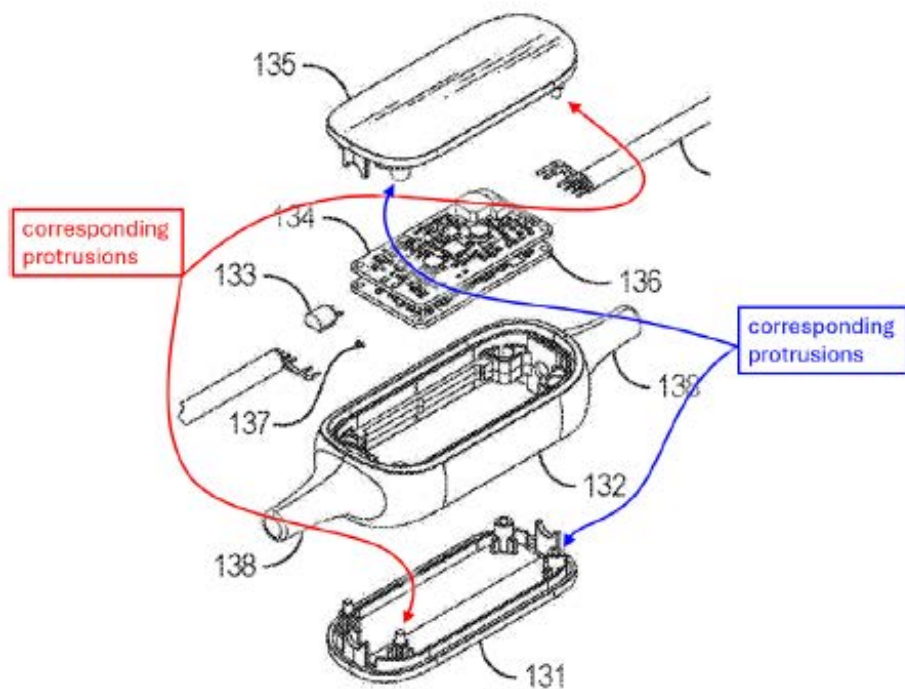
20 A. I don't believe we can -- because of
21 the perspective, we can see the inner ledge on
22 the lower opening.

1 Q. Do you believe that the perimeter lip
2 or the lower opening is depicted in Figure 1C?

3 A. Again, because of perspective, I
4 don't believe we can see that.

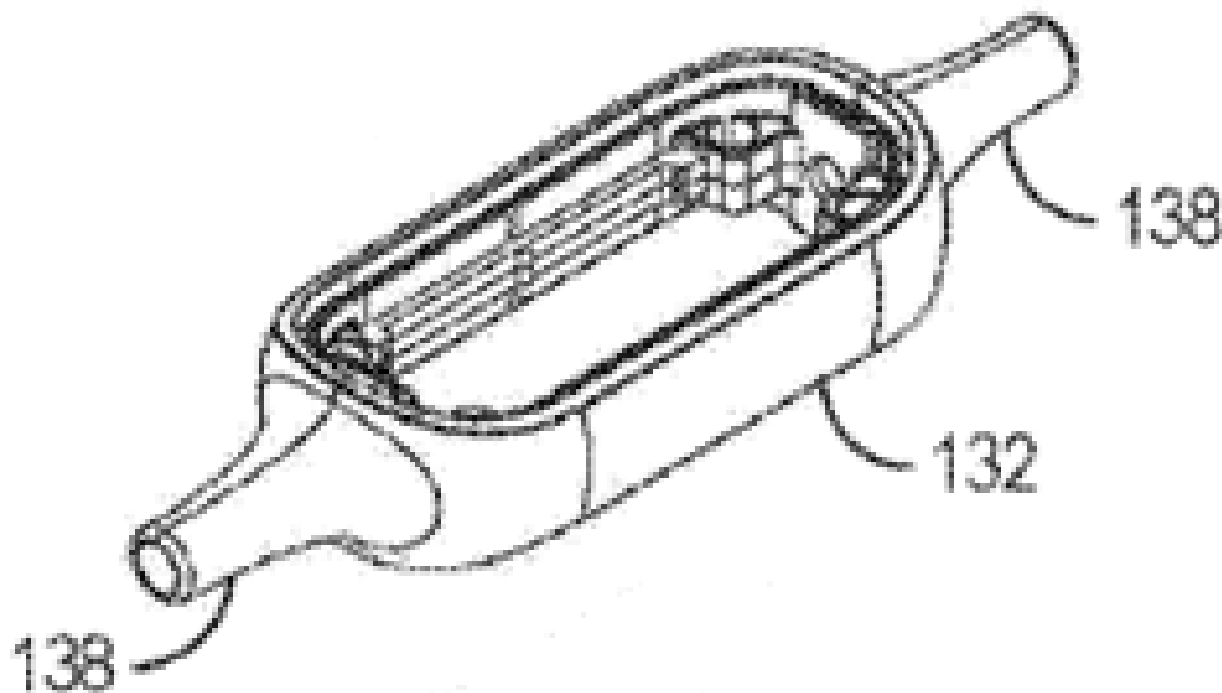
Element [21n] Lacks Written Description Support

Masimo's Reply:



Element [21n] Lacks Written Description Support

'507 Patent Original Disclosure:



EX2045, FIG.1C (partial); Opp. (Paper 52), 2-3. 87

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Masimo Cannot Combine Features From Different Embodiments

Flash-Control, LLC v. Intel Corp., 2021 U.S. App.
LEXIS 20790 at **12 (Fed. Cir. July 14, 2021)

artisan who brings "the knowledge of what has come before." *Id.* But that holding did not alter this court's precedent stating that "enough must be included [in the specification] to convince a person of skill in the art that the inventor possessed the invention." *Id.* A patent owner cannot show written description support by picking and choosing claim elements from different embodiments that are never linked together in the specification. HN5 In *Novo-zymes*, we explained that the elements of a claim must be treated as an "integrated whole rather than as a collection of independent limitations." 723 F.3d at 1349. The written description requirement is not met when, as here, the specification provides at best disparate disclosures that an artisan might have been able to combine in order to make the claimed invention. *Ariad Pharms.*, 598 F.3d at 1352. We

Element [23b] Lacks Written Description Support

Revised Motion to Amend Element [21e]:

wirelessly outputting the SPO2 measurement values and heart rate to
the smartphone mobile computing device; and

Element [23b]:

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;

Element [23b] Lacks Written Description Support

'507 Patent Original Disclosure:

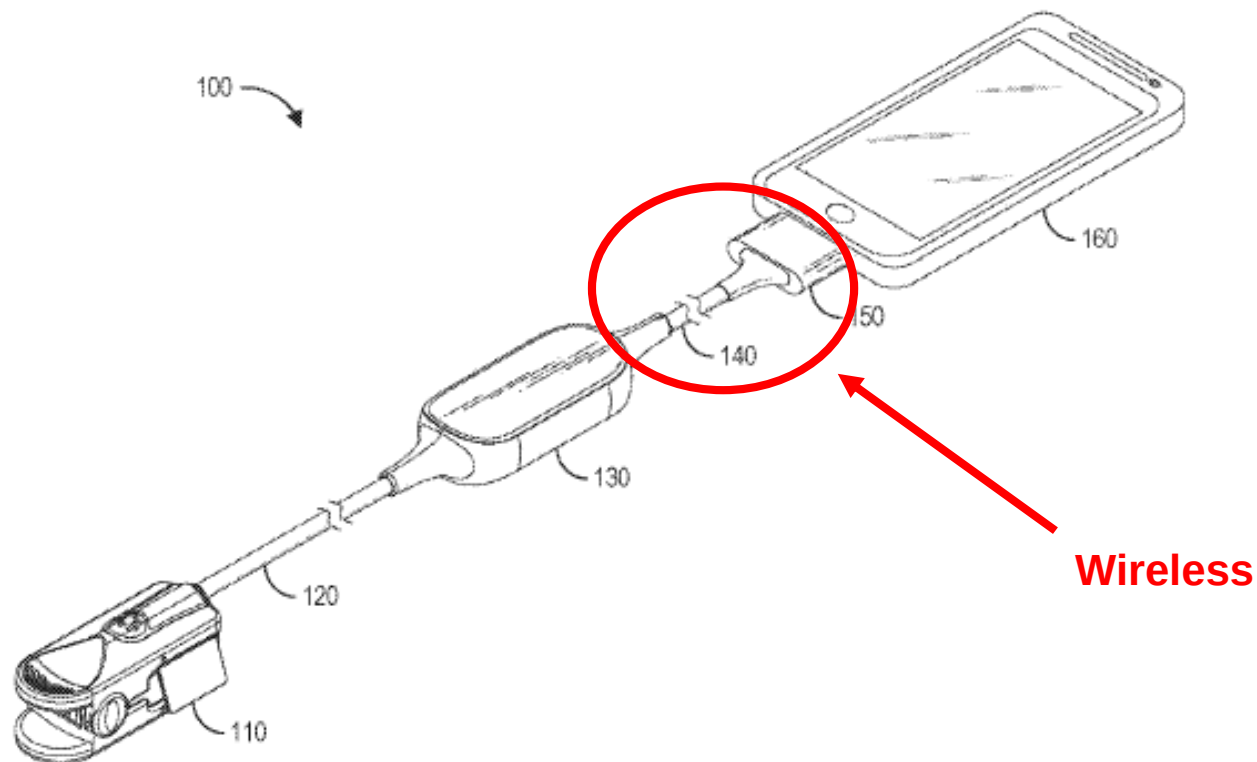


FIG. 1A

Element [23b] Lacks Written Description Support

'507 Patent Original

Disclosure:

[0027] The sensor data can be corrupted by noise due to patient movement, electromagnetic interference, or ambient light. Therefore, the sensor data is transmitted from sensor 110 along the first cable 120 to the processing module 130, which can apply noise filtering and signal processing techniques described below to provide output data for display on the smartphone 160. Such complex processing techniques can exceed the processing capabilities of the smartphone 160, and therefore the processing module 130 drives operation of the sensor 110 and handles signal processing and transmits the processed sensor parameter data as output measurement data. Smartphone 160 can be coupled to the processing module 130 by a second cable 140 and connection port 150, in some embodiments, and in other embodiments can be configured to wirelessly transmit the parameter data to the smartphone 160 or another computing device.

Element [23b] Lacks Written Description Support

'507 Patent Original

Disclosure:

[0041] The enclosure 132 can have a bend relief portion 138 on either side. The bend relief portions 138 may enhance the electrical and mechanical integrity and overall performance of the cable assembly by providing a gradual transition from the flexible cables to substantially rigid connection points with the processing board 134 contained within the enclosure. The bend relief portions 138 can prevent mechanical force, such as an axial load or flexing, that is applied to the exterior of either cable 120,140 from being transferred to the electrical terminations with the processing board 134. The bend relief portions 138 can be premolded and formed with the body of the enclosure, and in some embodiments a crimp ring may be secured around the cable within each bend relief.

Element [23b] Lacks Written Description Support

'507 Patent Original Disclosure:

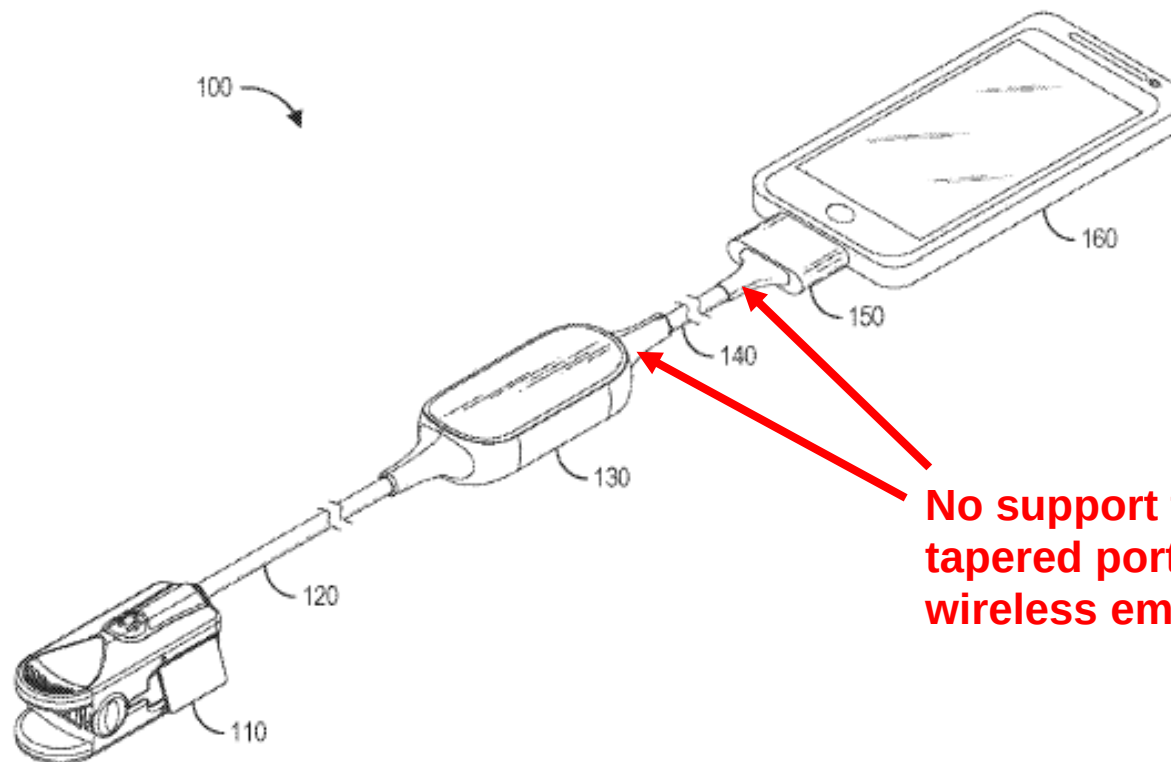


FIG. 1A

Element [23b] Lacks Written Description Support

Revised Motion to Amend Element [23b]:

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;

Element [23b] Lacks Written Description Support

'507 Patent Original Disclosure:

[0041] The enclosure 132 can have a bend relief portion 138 on either side. The bend relief portions 138 may enhance the electrical and mechanical integrity and overall performance of the cable assembly by providing a gradual transition from the flexible cables to substantially rigid connection points with the processing board 134 contained within the enclosure. The bend relief portions 138 can prevent mechanical force, such as an axial load or flexing, that is applied to the exterior of either cable 120,140 from being transferred to the electrical terminations with the processing board 134. The bend relief portions 138 can be premolded and formed with the body of the enclosure, and in some embodiments a crimp ring may be secured around the cable within each bend relief.

Element [23b] Lacks Written Description Support

'507 Patent Original Disclosure:

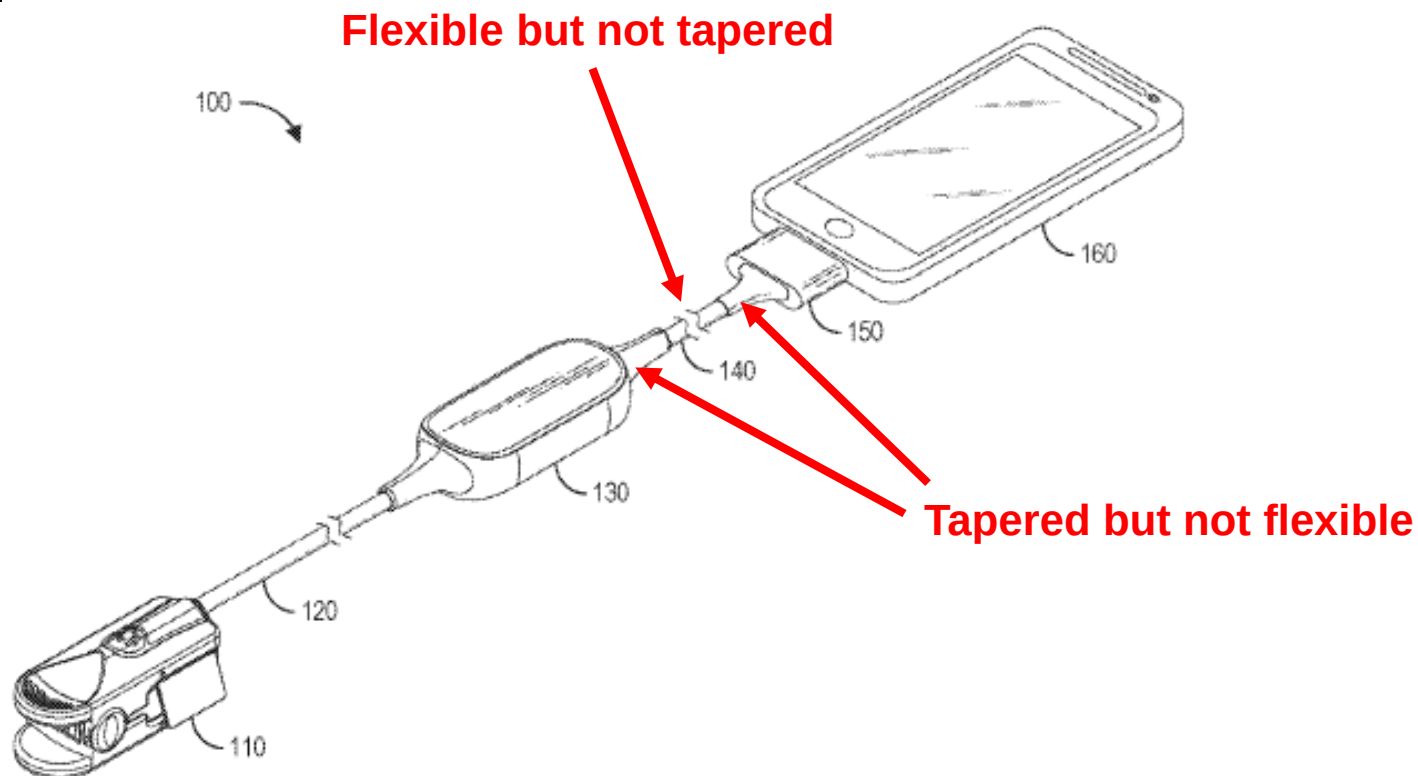


FIG. 1A

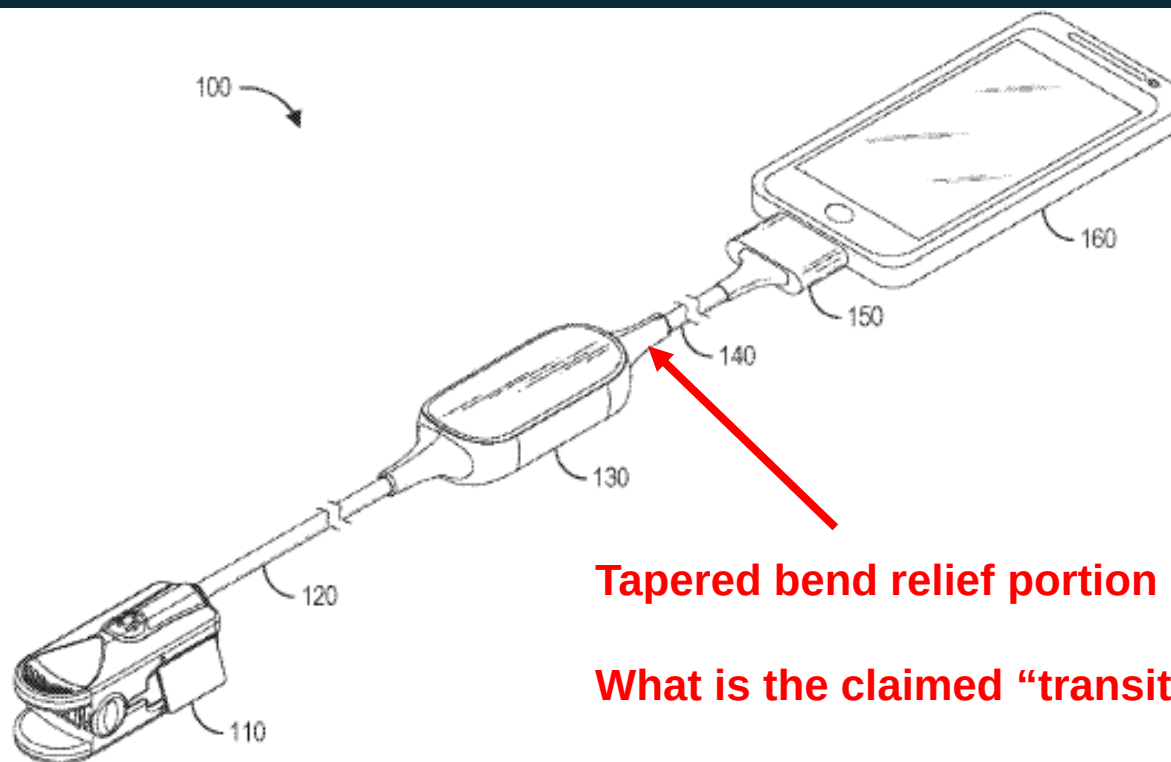
Element [23b] Lacks Written Description Support

Revised Motion to Amend Element [23b]:

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;

Element [23b] Lacks Written Description Support

'507 Patent Original Disclosure:



Tapered bend relief portion 138.

What is the claimed “transition”?

[0041] The enclosure 132 can have a bend relief portion 138 on either side. The bend relief portions 138 may enhance the electrical and mechanical integrity and overall performance of the cable assembly by providing a gradual transition from the flexible cables to substantially rigid connection points with the processing board 134 contained within the enclosure. The bend relief portions 138 can prevent mechanical force, such as an axial load

Element [23c] Lacks Written Description Support

Revised Motion to Amend Element [21e]:

wirelessly outputting the SPO2 measurement values and heart rate to
the smartphone mobile computing device; and

Element [23c]:

wherein the sensor and processing board are provided together with a wrist-
mounted device.

Element [23c] Lacks Written Description Support

'507 Patent Original

Disclosure:

[0023] FIGS. 1A, 1B, and 1C illustrate embodiments of a physiological monitoring system 100. The physiological monitoring system 100 shown in **FIG. 1A** includes a sensor 110, first cable 120, processing module 130, second cable 140, connection port 150, and a mobile computing device, illustrated here as smartphone 160. Although specific reference can be made to smartphones in this disclosure, any mobile computing device compatible with the physiological sensor system can be used. A compatible mobile computing device can be one of a wide range of mobile devices such as a mobile communications device (such as a smartphone), laptop, tablet computer, netbook, PDA, media player, mobile game console, wristwatch, wearable computing device, or other microprocessor based device configured to interface with a physiological sensor. Some embodiments of the mobile computing device can be used with the system for display of data and/or storage of data. Cables 120, 140 used with the device can be flex cables or other cables, including cables having triboelectric properties.

Masimo's Proposed Substitute Claims are Indefinite

Element [21p] Is Indefinite

Revised Motion to Amend Element [21p]:

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.

Element [21p] Is Indefinite

A. Element [21p] is Indefinite

PO's expert asserts that "a POSITA would understand the scope of the included-together limitation with reasonable certainty" yet neither PO nor its expert makes any attempt to identify this supposed apparent scope. EX2058, ¶¶45-47; Paper 53, 10-12. If the scope of this element were so apparent, Dr. Duckworth should have been able to articulate it. Indeed, under questioning, Dr. Duckworth was unable to determine if straight forward examples from Poeze fell within the scope of this "included-together" limitation, indicating that the scope of this element is far from clear. APPLE-1134, 103:4-109:5. This claim term is indefinite.

Element [21p] Is Indefinite

Masimo's Expert:

Q. My question is: In Figure 7 of Poeze, are the sensor 116 and monitor 118 included together?

MR. NELSON: Same objection.

THE WITNESS: Again, the use of the word "together," we have to look at the claim language there. And I've just described my opinion in paragraph 45 what it means to be included together.

BY MR. BISENIUS:

Q. The word -- I guess, let me reframe.

Would the arrangement of the sensor 116 and the monitor 118 depicted in Figure 7 of Poeze fall within the scope of the claim term, including the sensor and processing board together?

MR. NELSON: Objection.

THE WITNESS: That's not something I have provided an opinion on.

A. Yes, I understand the scope of the claim language and specification of the '507 patent.

Q. So with that understanding, that scope of the included-together limitation in mind, looking at Figure 7 of Poeze, are the sensor 116 and monitor 118 included together?

A. As I said, I have not provided an opinion on that in my declaration. But I'm not -- I'm not prepared to give an opinion on that on the fly.

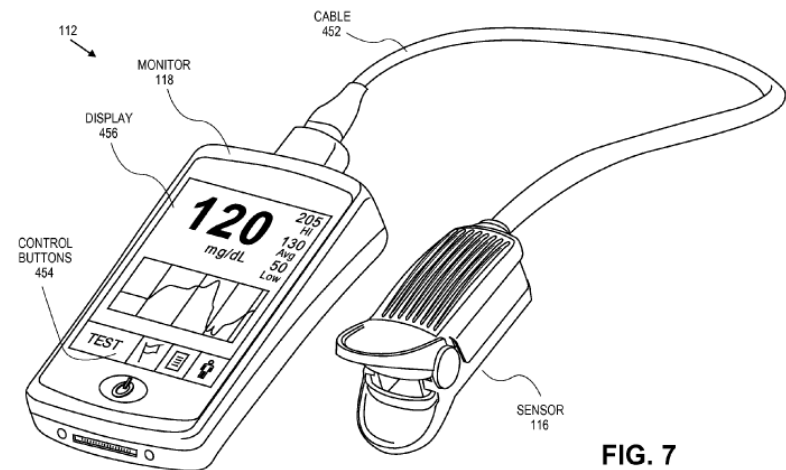


FIG. 7

Element [22c] Is Indefinite

Revised Motion to Amend Element [22c]:

wherein the processing said one or more analog signals comprises applying
an advanced signal processing algorithm with data filtering.

Element [22c] Is Indefinite

Sur-Reply:

B. Element [22c] is Indefinite

Dr. Duckworth asserts that “parallel engines and/or adaptive filters” fall within the scope of this claim element but refused to articulate whether this claim term is limited to these two forms of processing or could include additional forms of processing. EX2058, ¶51; APPLE-1134, 187:5-192:15. He was also unable to determine if other forms of processing would fall within the scope of this term. *Id.* Dr. Duckworth’s inability to identify what forms of processing fall within the scope of this claim element demonstrate its indefiniteness.

Sur-Reply to RMTA (Paper 58), 5.

Dr. Kenny:

130. In reviewing the specification of the '507, I noticed that the '507 Patent gives examples of types of signal processing that would fall into the category of “advanced signal processing techniques.” APPLE-1001, 6:7-12. These examples include “parallel engines and adaptive filters.” *Id.* While I do not believe that the “advanced signal processing algorithm” recited by claim 22 requires either of these forms of signal processing, I have been asked to review the Diab reference and I find that Diab discloses use of parallel engines and adaptive filters in physiological sensor signal processing and therefore, when combined with Poeze, Kianl, Baba, and Pakula, renders claim 22 obvious even if the term “advanced signal processing algorithm” is interpreted narrowly.

APPLE-1109, ¶130.

Apple's Citation to its Petition is Proper

Apple's Citation to its Petition is Proper

***Cisco Sys., Inc. v. Focal IP, LLC*, IPR2016-01257, Paper 57, 6 (PTAB Oct. 19, 2017)**

Accordingly, we authorize Petitioners to file a supplemental brief limited to fifteen (15) pages due October 31, 2017, in each of the instant proceedings. Petitioners should not incorporate by reference arguments made in other papers. As Petitioners should have already presented arguments and evidence pertaining to limitations added by Patent Owner to distinguish over prior art, Petitioners' supplemental brief should be limited to the issue regarding the unpatentability of the proposed substitute claims, addressing original claim limitations not previously addressed by Petitioners based on the prior art in the record.

***Samsung Elecs. Co. v. Promos Techs., Inc.*, IPR2017-00037, Paper 21, 3–4 (PTAB Oct. 18, 2016)**

Petitioner's request that we waive our rule against incorporation by reference. *See* 37 C.F.R. § 42.6(a)(3). In light of Petitioner's representation that it does not need additional pages if it is only required to address the newly-added limitations, however, we confirm that Petitioner can focus its Opposition on the newly-added limitations. Petitioner is cautioned, however, that it still must consider the claims as whole, for example, with respect to motivation to combine references. We further note that we treat Patent Owner's request to substitute claims as contingent, and will only consider a proposed substitute claims if the original patent claim it replaces is determined to be unpatentable, or is canceled by Patent Owner. *See* Paper 15, 2. Accordingly, we evaluate the patentability of Patent Owner's substitute claims based on the entirety of the record.

***Nike, Inc. v. Adidas AG*, 955 F.3d 45, 51-52 (Fed. Cir. 2020)**

We addressed the universe of prior art that the Board should consider when reviewing a motion to amend in *Aqua Products*. There, we held that the Board may not "base its patentability determinations with respect to amended claims solely on the face of the motion to amend, without regard to the remainder of the IPR record." [872 F.3d at 1325](#). Rather, the Board "must consider the *entirety* of the record before it when assessing the patentability of amended claims." [Id. at 1296](#) (emphasis added).

Apple's Citation to its Petition is Proper

For example, far from representing a blanket ban on citation to earlier briefs from the same proceeding, as PO implies, the order in *Cisco Sys.* (cited at Paper 53, 13) addressed special briefing granted in response to a change in law due to the Federal Circuit's decision in *Aqua Prods., Inc. v. Matal*. Specifically, the supplemental briefing in *Cisco* was limited to "limitations not previously addressed by Petitioners based on the prior art in the record" and as such, similar to the present case, the Petitioner did not need to address application of prior art to claim elements that had already been addressed in previous briefs in the proceeding.

IPR2016-01257, Paper 57, 6 (PTAB Oct. 19, 2017). Similarly, in *Samsung Elecs.*,

IPR2016-01257, Paper 57, 6 (PTAB Oct. 19, 2017). Similarly, in *Samsung Elecs.*, the Petitioner was advised to "focus its Opposition on the newly-added limitations" because application of the prior art to original claim limitations that had been presented in previous briefs was not necessary. IPR2017-00037, Paper 21 at 3-4 (PTAB Oct. 18, 2016). That is precisely the case here. Petitioner already addressed application of *Kianl* and Moon to original claim elements in the Petition and therefore was not required to repeat that analysis in the Opp. brief. See *Tesla, Inc. v. Autonomous Devices, LLC*, IPR2023-01169, Paper 44 at 89-92 (PTAB Jan. 6, 2025) (finding that citation to the Petition in the Opposition is not an improper incorporation by reference). Indeed, "the Board '**must consider the entirety of the record** before it when assessing the patentability of amended claims.'" *Nike, Inc. v. Adidas AG*, 955 F.3d 45, 51-52 (Fed. Cir. 2020) (quoting *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017) (*en banc*)). Such a wholistic assessment of

Sur-Reply to RMTA (Paper 58), 5.

Prior Art Renders Substitute Claims Obvious

The Opposition Does Not Rely on Hindsight

The Opposition Does Not Rely on Hindsight

Petitioner identified multiple reasons that would have prompted a POSITA to modify Poeze's system in the proposed manner to achieve known benefits for each proposed combination in the Opp. brief. Opp., 9, 11-14, 16, 18, 27-29, 32, 34-36, 38-39. As such, the Opp. properly identifies why a POSITA “would have selected these components for combination in the manner claimed” and identifies how the resulting system provides each claim element of the claims as a whole rather than “simply identify[ing] individual claim components” as PO asserts. *In Re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000). As held by the Supreme Court in *KSR*, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int. Co. v. Teleflex Inc.*, 550 U.S. 398, 415-16 (2007). Such is the case here.

Prior Art Renders Substitute Claim 21 Obvious

“one or more analog signals responsive to light...”

Revised Motion to Amend Element [21a]:

outputting, from an optical sensor of an SpO2 measurement system, one or more analog signals responsive to light from a light source attenuated by tissue of the user at a measurement site, said one or more analog signals responsive to an oxygen saturation of said tissue; and

Element [21c]:

receiving through a wired connection said one or more analog signals from the optical sensor;

Poeze's Monitor 118 receives "one or more analog signals responsive to light..." from the Sensor 116

Poeze:

Output of detectors provided to front-end interface

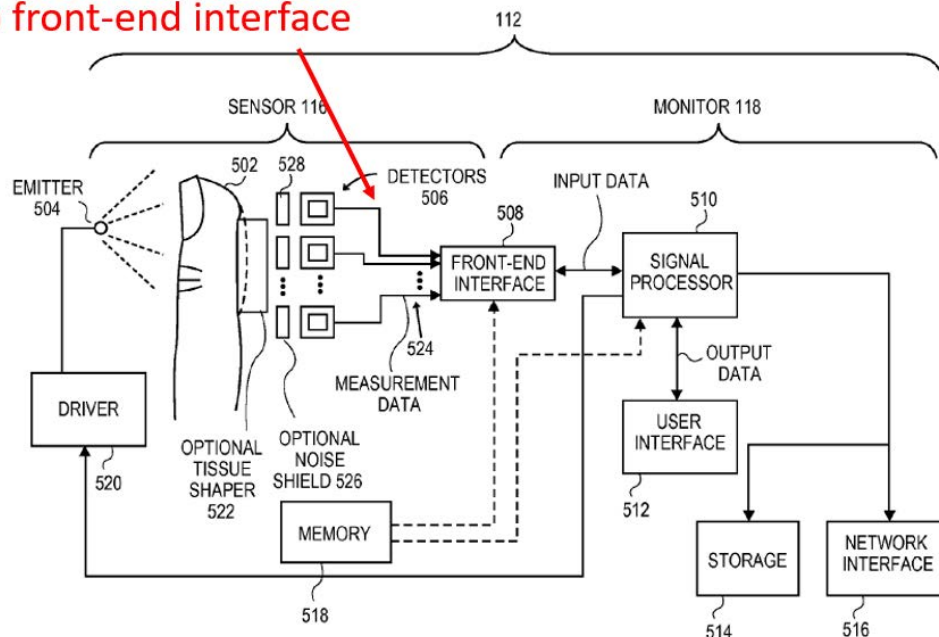


FIG. 8

APPLE-1110, FIG. 8.

Masimo's Expert:

"Dr. Kenny and I agree that the signal 524 from the detectors 506 of Poeze's sensor 116 "is an analog signal." Exhibit 1109 ¶56."

EX2058, ¶58.

Poeze:

[0120] The front-end interface 508 provides an interface that adapts the output of the detectors 506, which is responsive to desired physiological parameters. For example, the front-end interface 508 can adapt a signal 524 received from one or more of the detectors 506 into a form that can be processed by the monitor 118, for example, by a signal processor 510 in the monitor 118. The front-end interface 508 can have its components assembled in the sensor 116, in the monitor 118, in connecting cabling (if used), combinations of the same, or the like. The location of the front-end interface 508 can be chosen based on various factors including space desired for components, desired noise reductions or limits, desired heat reductions or limits, and the like.

APPLE-1110, [0120].

Poeze's Monitor 118 receives "one or more analog signals responsive to light..." from the Sensor 116

Poeze:

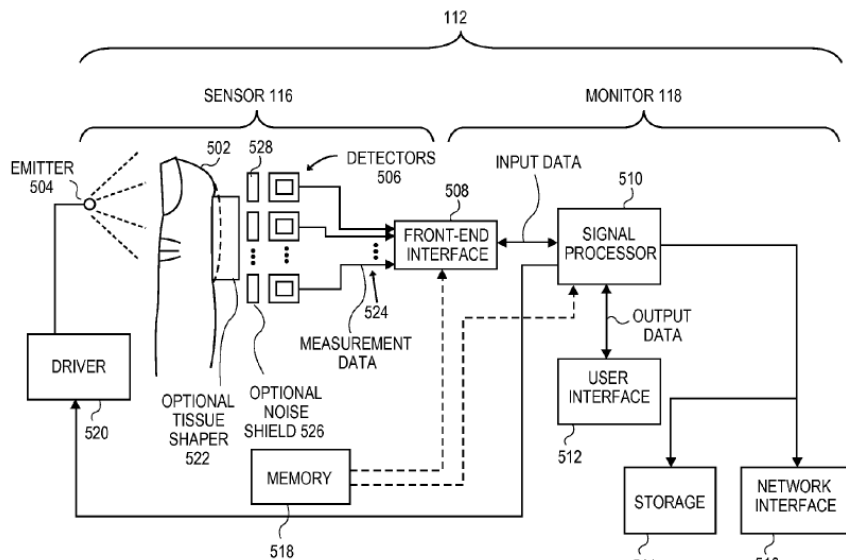


FIG. 8

APPLE-1110, FIG. 8.

[0122] The front-end interface 508 can be implemented using one or more amplifiers, such as transimpedance amplifiers, that are coupled to one or more analog to digital converters (ADCs) (which can be in the monitor 118), such as a sigma-delta ADC. A transimpedance-based front-end interface 508 can employ single-ended circuitry, differential circuitry, and/or a hybrid configuration. A transimpedance-based front-end interface 508 can be useful for its sampling rate capability and freedom in modulation/demodulation algorithms. For example, this type of front-end interface 508 can advantageously facilitate the sampling of the ADCs being synchronized with the pulses emitted from the emitter 504.

[0123] The ADC or ADCs can provide one or more outputs into multiple channels of digital information for processing by the signal processor 510 of the monitor 118. Each channel can correspond to a signal output from a detector 506.

[0124] In some embodiments, a programmable gain amplifier (PGA) can be used in combination with a transimpedance-based front-end interface 508. For example, the output of a transimpedance-based front-end interface 508 can be output to a PGA that is coupled with an ADC in the monitor 118. A PGA can be useful in order to provide another level of amplification and control of the stream of signals from the detectors 506. Alternatively, the PGA and ADC components can be integrated with the transimpedance-based front-end interface 508 in the sensor 116.

Poeze's Monitor 118 receives "one or more analog signals responsive to light..." from the Sensor 116

Masimo:

Limitation [21a]: Apple relies on Poeze embodiments where the “*front-end interface [508] adapts a signal 524* received from one or more of the detectors 506 *into a form that can be processed* by the monitor 118.” Opp., 15 (quoting EX1110, [0120]). The signal 524 from the detectors 506 of Poeze's sensor 116 “is an analog signal.” EX2058 ¶57; EX1109 ¶56. That analog signal must be converted (“adapt[ed]”) into a digital signal (another “form”) before it can be processed by the signal processor 510 in monitor 118. EX2058 ¶57; EX1110, [0120]. Poeze's front-

Apple:

While PO's assertion that the analog signal must be converted “into a digital signal (another ‘form’) before it can be processed by the signal processor 510” is true (Paper 53, 21), the Opp. expressly identifies that this analog to digital conversion is performed by “*an ADC in the monitor 118*” that receives “the output of a transimpedance-based front-end interface 508.” APPLE-1110, [0124]; Opp., 15-16; APPLE-1134, 33:15-34:9, 36:10-17 (Masimo's expert confirming that the PGA and ADC in monitor 118 receive an analog signal), 99:6-20. As discussed in

Poeze's Monitor 118 receives "one or more analog signals responsive to light..." from the Sensor 116

Apple (Opp. to RMTA):

[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.

Opp. (Paper 52), 14-15. 118

The Opposition to RMTA does not combine disparate embodiments of Poeze

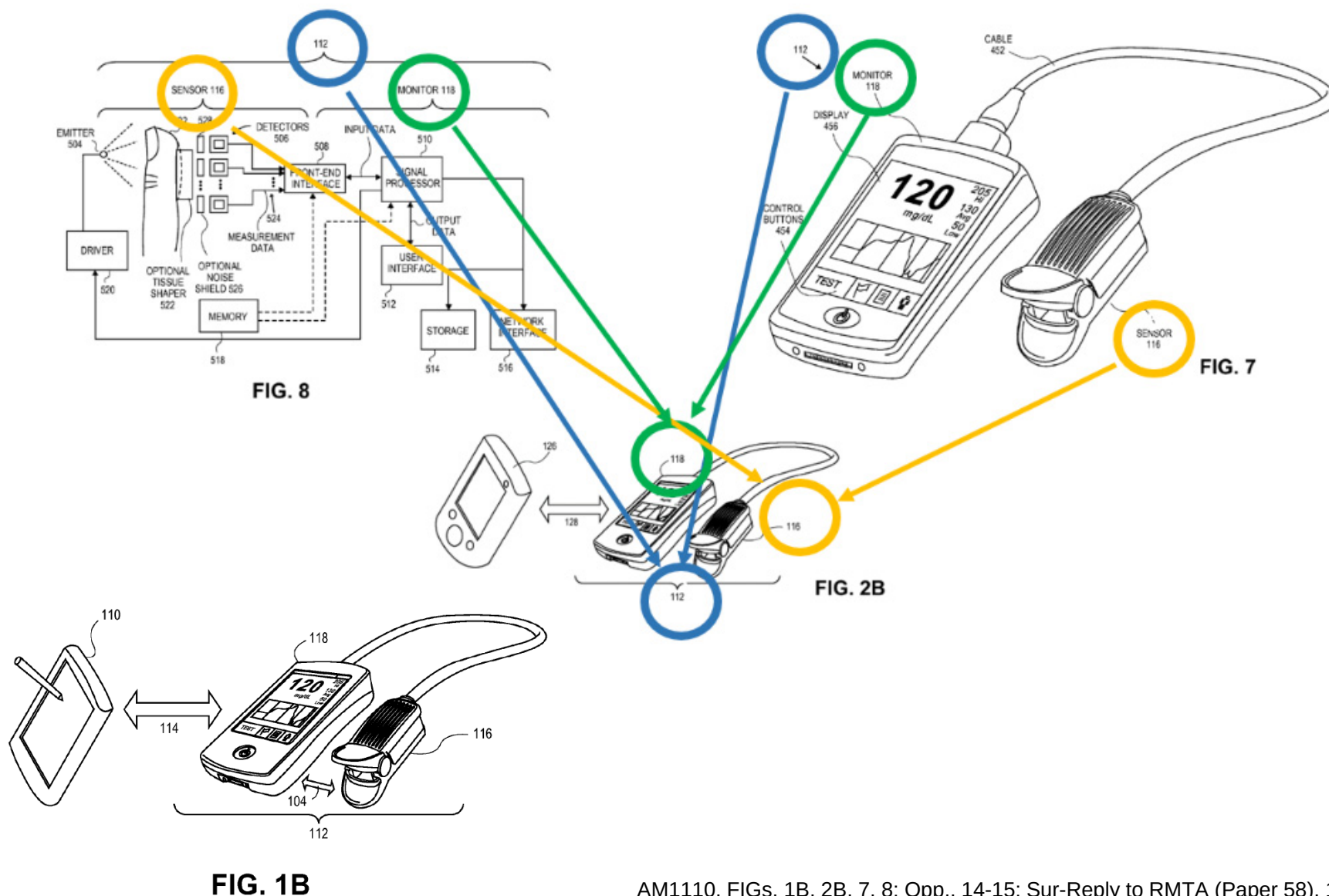
Apple (Opp. to RMTA):

[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.

Opp. (Paper 52), 14-15. 119

The Opposition to RMTA does not combine disparate embodiments of Poeze



AM1110, FIGs. 1B, 2B, 7, 8; Opp., 14-15; Sur-Reply to RMTA (Paper 58), 11-13.

Obvious to Mount Poeze's ADC and Signal Processor on a Circuit Board Based on Pakula

Obvious to Mount Poeze's ADC and Signal Processor on a Circuit Board Based on Pakula

PO's Reply:

signal processor 510)" on a board such as a PCB. Opp., 16. But contrary to Apple's argument, the ADC is not an internal component of Poeze's monitor 118. Instead, Apple relies on Poeze embodiments where the front-end interface's ADC converts the detector signal 524 into a digital signal *before* it reaches the monitor 118. *Supra*

Reply to RMTA (Paper 53), 24-25.

Poeze:

[0122] The front-end interface 508 can be implemented using one or more amplifiers, such as transimpedance amplifiers, that are coupled to one or more analog to digital converters (ADCs) (which can be in the monitor 118), such as a sigma-delta ADC. A transimpedance-based front-end inter-

APPLE-1110, [0122]-[0124].

Opp. (Paper 52), 15.

Obvious to Mount Poeze's ADC and Signal Processor on a Circuit Board Based on Pakula

Dr. Kenny:

42. As I discussed above, a POSITA also would have been motivated to apply the teachings of Pakula to the physiological monitoring system of Poeze to implement the monitor 118 to house the electronic components of Poeze's monitor 118 within the protective housing disclosed by Pakula for multiple reasons. As a first reason, such an application of Pakula's teachings to Poeze's system would have protected the display and internal electronic components of Poeze's monitor 118 from damage. Pakula describes providing "improved techniques and

APPLE-1109, ¶42.

Pakula:

[0048] According to another aspect, apparatus, systems and methods for robustly attaching a cover portion of an electronic device to a bottom portion, e.g., a housing portion, of

[0049] According to another aspect, a cover assembly can be configured to support and protect an outer glass member.

APPLE-1113, [0048]-[0049].

Opp. (Paper 52), 11, 13.

123

Obvious to Mount Poeze's ADC and Signal Processor on a Circuit Board Based on Pakula

Opp:

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 "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.

Obvious to Mount Poeze's ADC and Signal Processor on a Circuit Board Based on Pakula

Opp:

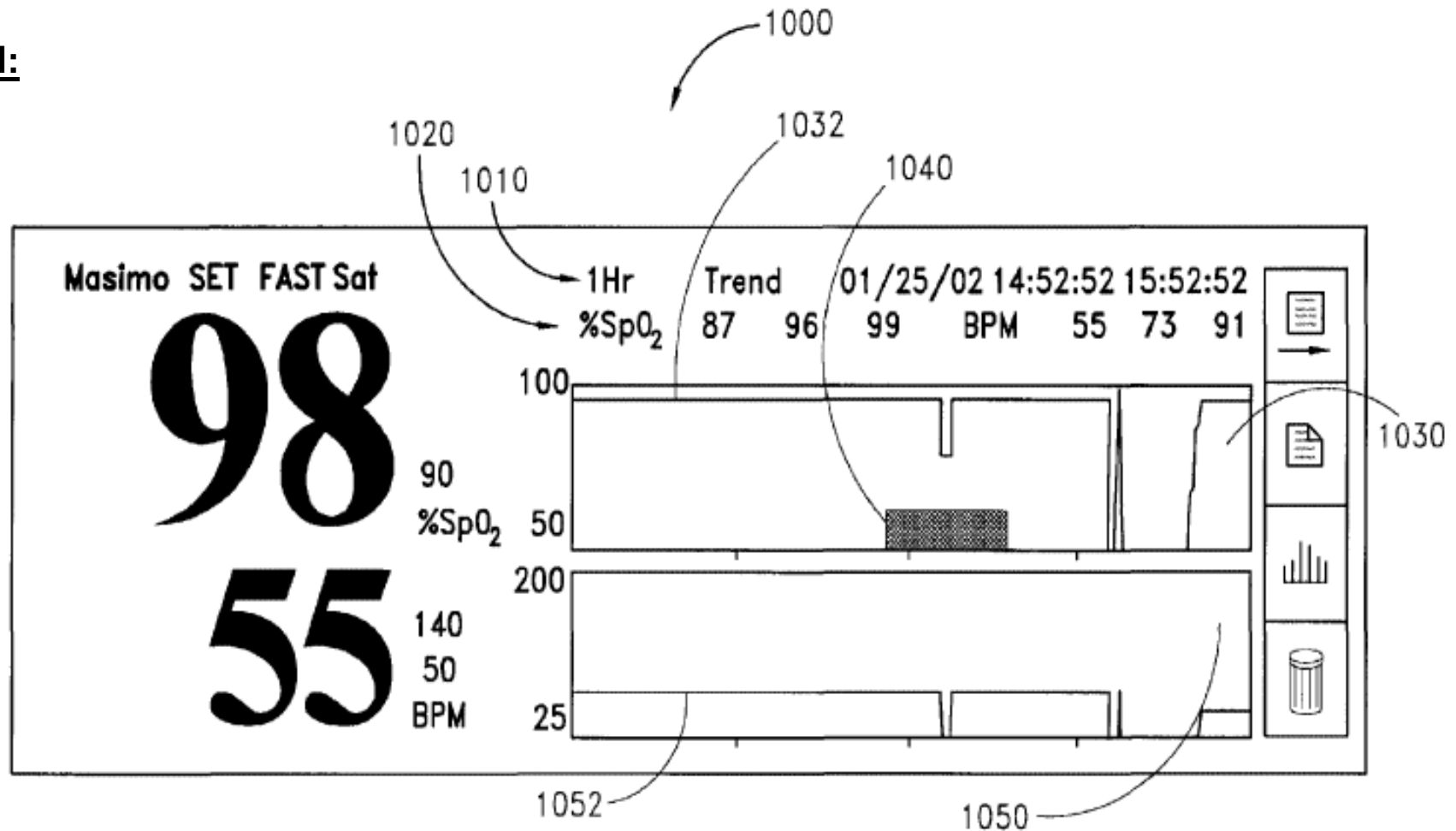
as was well-known in the art. For example, Pakula describes that various internal computing components of the resulting device “can be electrically coupled using one or more of a *PCB*...” APPLE-1113, [0066], [0069]-[0070] (“the internal platform can be formed by a printed circuit board.”). For example “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-

Opp. (Paper 52), 16 (citing APPLE-1113, [0066], [0069]-[0070], [0085]-[0086]).

Obvious to Apply Kianl and Baba's Teachings to Poeze

Obvious to Apply Kianl and Baba's Teachings to Poeze

Kianl:



APPLE-1006, FIG. 10; Opp. (Paper 52), 19-20.

127

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Obvious to Apply Kianl and Baba's Teachings to Poeze

Opp. to RMTA:

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.

Opp. (Paper 52), 11-12.

128

Obvious to Apply Kianl and Baba's Teachings to Poeze

Opp. to RMTA:

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.

Obvious to Apply Kianl and Baba's Teachings to Poeze

Sur-reply:

The Opp. identified six reasons that would have prompted a POSITA to apply Kianl's teachings regarding display of historical trend data and input key icons to Poeze. Opp., 11-12; APPLE-1109, ¶¶28-36. PO does not dispute any of

Sur-Reply to RMTA (Paper 58), 15.

Dr. Kenny:

28. In my opinion, a POSITA would have been motivated to modify the physiological monitoring system of Poeze to (1) include user interfaces that display historic physiological sensor information and user input icons as taught by Kianl; (2) include a heart icon in the user interface displayed by the smartphone that represents the current status of the user's heart rate (e.g., within the target zone, above the target zone, or below the target zone) as taught by Baba; and (3) implement the monitor 118 of Poeze's system to include the protective electronic device housing disclosed by Pakula.

APPLE-1109, ¶¶28-36

130

Obvious to Apply Kianl and Baba's Teachings to Poeze

PO asserts that a POSITA would have preferred to display Kianl's user interface elements “on the same device that generates the complex data and inputs.” Pap. 53, 28. However, even if this assertion were true (which the record does not support), this would be, at most, an alternative configuration to that described in the Opp., not a teaching away. *See In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (better alternative is not a teaching away); *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Additionally, PO’s insistence that Ground 1A must adopted Kianl's teachings to display input controls and trend data “on the same device that generates the complex data” improperly reduces the POSTIA to an “‘automaton’ that can only add pieces of prior art.” *Transocean Offshore Deepwater Drilling v. Maersk Contractors USA*, 617 F.3d 1296, 1304 (Fed. Cir. 2010). A proper obviousness analysis may rely on the prior art for all that it teaches and does not require bodily incorporation of every aspect of a secondary reference into the primary reference. *Mouttet*, 686 F.3d at 1332; *Axonics, Inc. v. Medtronic, Inc.*, 73 F.4th 950, 957 (Fed. Cir. 2023).

Obvious to Apply Kianl and Baba's Teachings to Poeze

Poeze:

virtual reality depiction of the hospital. In addition, the display 206 can be configured so that a "Portrait View" is used to display numbers and a "Horizontal/Landscape" view is used to view full screen trended data (e.g. readings tracked over a period of time). Both view options can be overridden in the

APPLE-1110, [0051].

modify dietary strategies for glucose control. In an embodiment, trending data is displayed to the user in various graphical formats on the display 206 through the medical data display module 344.

APPLE-1110, [0062].

work 124. In that embodiment, the medical data analysis module 326 is used to receive input from a user, via the input 234 and/or the display/touch panel 206, indicating food taken throughout the day. Then the medical data analysis module

APPLE-1110, [0062].

[0066] In an embodiment, the medical data analysis module 326 works with the medical data display module 344 to provide visualization of health data tracking or trending. In an embodiment, the medical data display module 344 displays trended data for a user in a variety of graphical formats, for example, when rotated in a horizontal position. The trended

APPLE-1110, [0066].

Obvious to Apply Kianl and Baba's Teachings to Poeze

PO's Reply:

Apple asserts it would have been obvious to modify Poeze's touchscreen to implement Kianl's input icons and health data trend displays and Baba's heart icon.

Id. To the contrary, a POSITA would not have attempted to modify Poeze's

Paper 53, 28.

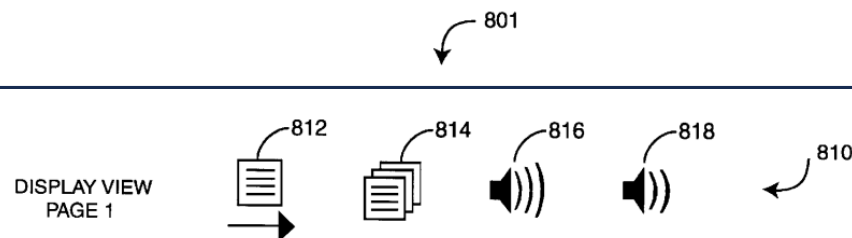
Poeze:

orientation. In alternative embodiments, the data collection device **112** can be provided without a user interface **112** and can simply provide an output signal to a separate display or system.

APPLE-1110, [0128].

Kianl:

FIGS. 8A–B are hierarchical charts of soft key icons corresponding to the soft key buttons **260** (FIG. 2A). A soft key icon is selected by pressing and releasing the soft key button to the right of the icon (horizontal display) or underneath the icon (vertical display). Four icons are shown on the right side or bottom of the display. FIG. 8A illustrates a first set of soft key icons **801**, including the first page of display view icons **810**, menu icons **820**, category icons **830** and parameter icons **840**. FIG. 8B illustrates a second set of



APPLE-1006, 9:44-10:27, FIGs. 8A-10 133

Obvious to Apply Kianl and Baba's Teachings to Poeze

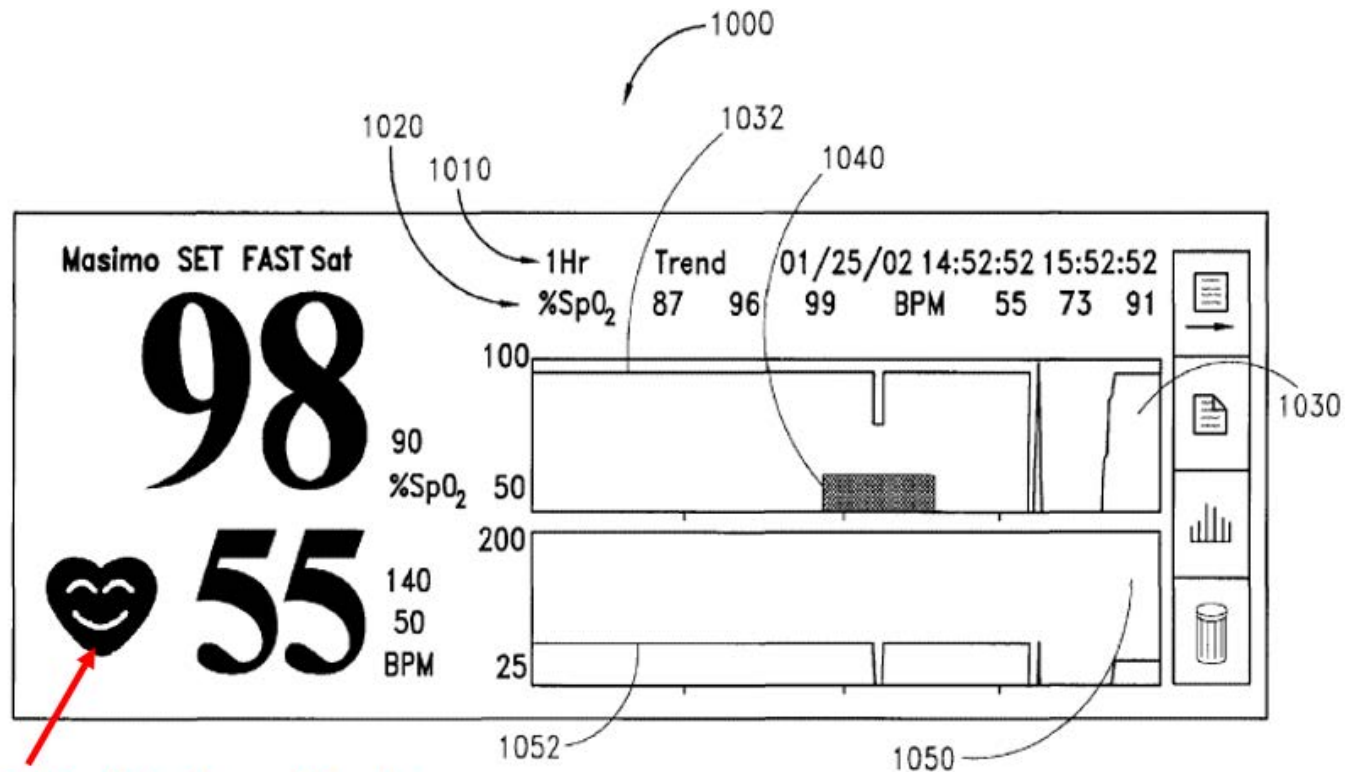
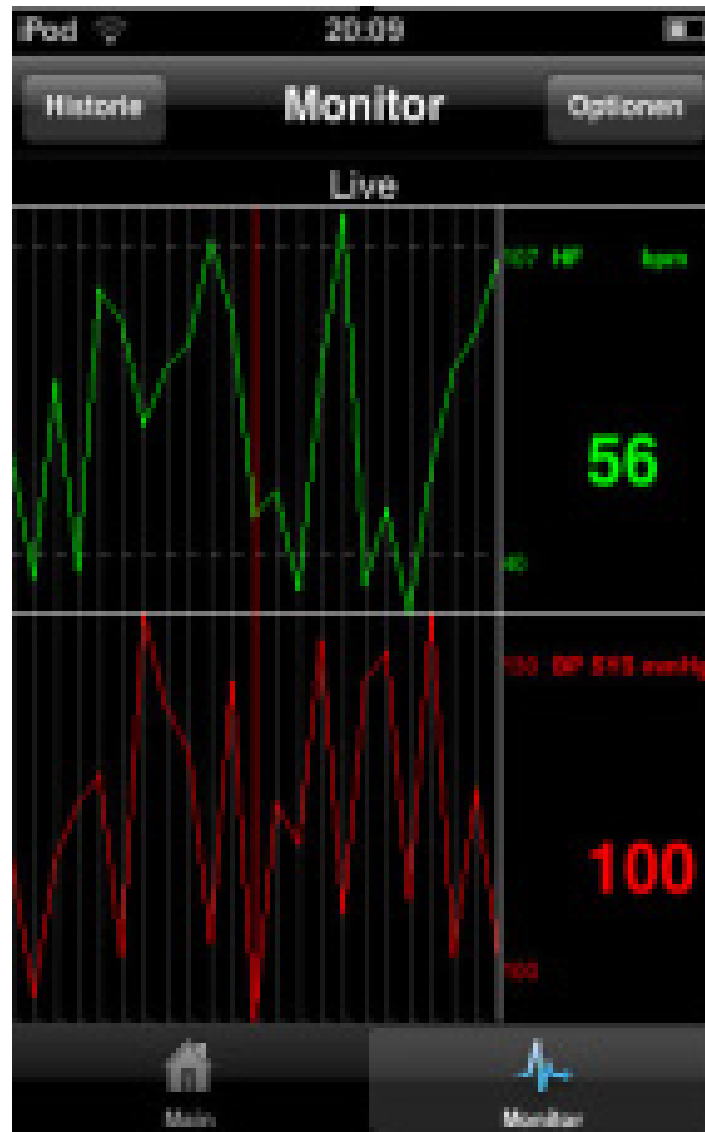


FIG. 10 of Kianl modified to include Baba's heart icon 400

Obvious to Apply Kianl and Baba's Teachings to Poeze



APPLE-1007, 4; Sur-Reply to RMTA (Paper 58), 17. 135

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Obvious to Apply Moon's Teachings to Poeze

Obvious to Apply Moon's Teachings to Poeze

Opp. to RMTA:

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.

Opp. (Paper 52), 32.

137



THANK YOU