

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOTERA WIRELESS, INC.
Petitioner

v.

MASIMO CORPORATION
Patent Owner

Case No. IPR2020-00954
Patent No. 9,788,735

Before JOSIAH C. COCKS, JENNIFER MEYER CHAGNON, and
ROBERT L. KINDER, Administrative Patent Judges.

PETITIONER'S REPLY

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EXHIBIT LIST

Ex #	Description
1001	U.S. Patent No. 9,788,735 (“the ’735 patent”)
1002	Prosecution History of the ’735 Patent
1003	Expert Declaration of George Yanulis
1004	<i>Curriculum Vitae</i> for George Yanulis
1005	U.S. Patent No. 6,840,904 to Goldberg (“Goldberg”)
1006	PCT Publication No. WO 00/42911 to Kiani et al. (“Kiani”)
1007	EP0880936A2 to Akai (“Akai”)
1008	U.S. Patent No. 5,919,141 to Money (“Money”)
1009	PCT Publication No. WO 99/13698 to Estep (“Estep”)
1010	’735 Patent File History Excerpt, Application as filed on April 27, 2017
1011	’735 Patent File History Excerpt, Preliminary Amendment filed May 22, 2017
1012	’735 Patent File History Excerpt, Pre-Interview Office Action issued July 3, 2017
1013	U.S. Patent No. 6,241,684 to Amano (“Amano”)
1014	’735 Patent File History Excerpt, Notice of Allowance with Examiner’s Amendment issued Aug. 28, 2017
1015	Masimo’s Adversary Complaint, United States Bankruptcy Court for the Southern District of California, <i>In re: Sotera Wireless, Inc.</i> , No. 16-05968-LT11, filed October 7, 2016
1016	U.S. Patent No. 4,425,921 to Fujisaki (“Fujisaki”)
1017	International Publication No. WO00/44274
1018	Japanese Publication No. JP0558122A, with English Machine Translation
1019	U.S. Patent No. 4,338,950
1020	U.S. Patent No. 4,450,843
1021	U.S. Patent No. 4,807,639

Ex #	Description
1022	U.S. Patent No. 5,539,706
1023	U.S. Patent No. 6,850,788 (Parent to '735 Patent)
1024	U.S. Patent No. 7,844,314 (Parent to '735 Patent)
1025	U.S. Patent No. 7,844,315 (Parent to '735 Patent)
1026	U.S. Patent No. 8,548,548 (Parent to '735 Patent)
1027	U.S. Patent No. 9,113,831 (Parent to '735 Patent)
1028	U.S. Patent No. 9,113,832 (Parent to '735 Patent)
1029	Masimo's Complaint for Patent Infringement against Sotera (ECF No. 1), filed June 12, 2019
1030	Service of Summons and Complaint upon Sotera (ECF No. 5)
1031	U.S. Patent No. 10,213,108 ("the '108 patent")
1032 - 1035	<i>Intentionally omitted</i>
1036	Defendant Sotera Wireless, Inc.'s Motion to Stay Proceedings, ECF No. 48
1037	Order Vacating Claim Construction Hearing, ECF No. 81
1038	Defendants' Stipulation of Invalidity Contentions, ECF No. 86
1039	<i>Intentionally omitted</i>
1040	Expert Declaration of Bryan Bergeron, MD
1041	Bergeron CV
1042	Deposition Transcripts (Vols. I & II) from the April 28, 2021 and April 29, 2021 Depositions of Alan Oslan with signed errata
1043	U.S. Patent No. 4,889,132
1044	Datasheet for EPROM/ROM-Based 8-bit CMOS Microcontroller Series, PIC16C5X
1045	Running Armband & Wristband Phone Holder, https://www.amazon.com/Running-Armband-Wristband-Rotatable-Cellphone/dp/B08DJ2B6X5/

Ex #	Description
1046	Patent Owner Masimo Corp's Response to Petition for Inter Partes Review of U.S. Patent No. 9,872,623 ("the '623 Patent")
1047	AT&T Co. Standard, Section 463-400-100, Issue 1, May 1978
1048	AT&T Co. Standard, Section 463-400-110, Issue 2, May 1979
1049	Modular Connector Guide, C2G, https://www.cablestogo.com/learning/connector-guides/modular
1050	U.S. Patent No. 5,637,002
1051	U.S. Patent No. 4,557,545
1052	U.S. Patent No. 6,755,689
1053	U.S. Design Patent No. D391,551
1054	U.S. Design Patent No. D390,192
1055	IEEE Std 1394a-2000 – IEEE Standard for a High Performance Serial Bus – Amendment 1, March 30, 2000
1056	<i>Intentionally Omitted</i>
1057	U.S. Patent No. 4,883,055
1058	Invicta Men's Pro Diver, https://www.amazon.com/Invicta-Quartz-Chronograph-Abalone-Bracelet/dp/B0772D8BWK/
1059	iKey, AK 39, Rugged Wearable Keyboard

I. INTRODUCTION

Petitioner persuasively demonstrated obviousness of the '735 Patent in all petition grounds. In response to Petitioner's strong grounds, Patent Owner ("Masimo") now clings to patentability by arguing the alleged absence of features so conventional that Masimo's expert witness admitted to teaching those concepts to undergraduate engineering students as a teacher's assistant. EX1042, 164:22-166:15. Masimo's arguments rely on Goldberg's omission of wiring specifics and Money's lack of disclosure of an SpO₂ sensor transmitting an analog signal (even though analog SpO₂ sensors were known and conventional). However, these arguments ignore basic obviousness tenets. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success). Converting an analog signal to a digital signal (or vice versa) was obvious to a PHOSITA in 2002, as was the use of ports for wired connections. Although Masimo did not invent a device capable of receiving both analog and digital signals or a wearable device having ports, that is the technology Masimo now seeks to patent. This effort should be denied.

II. CLAIM CONSTRUCTION

A. "sensor communication port"

The construction of "sensor communication port" is not an issue that the Board must resolve to find the '735 Patent invalid. Masimo makes no contention

that the prior art ports are not ports under its construction. Additionally, Masimo's expert freely admitted that ports were known. EX1042, 23:3-5. As such, construction of this term is not case dispositive.

Furthermore, Masimo's insistence that this claim term needs construction is a waste of Board resources. The Board invited the parties to construe this term only if it should be given a "special meaning" (Paper 13, p. 21), but Masimo has not offered a special meaning. Indeed, Masimo offered a construction that is allegedly the "ordinary and customary meaning." Paper 21, pp. 15–19. The Board need not extend resources at the whim of a party that fails to follow the Board's instructions, especially when the construction does not change the invalidity analysis.

In any event, Masimo's proffered construction is wrong.¹ Masimo argues that a sensor port is "a connector that mates with a compatible connector from a

¹ Masimo argues that Dr. Yanulis' testimony concerning claim construction in District Court is contradictory. Masimo points to Yanulis' statements regarding a different term, however, making any supposedly contradiction irrelevant for construing "ports." More importantly, Yanulis applied *Masimo's* construction from related infringement contentions to demonstrate that Masimo's construction invalidates the '735 Patent. Applying the Masimo's own construction in this

sensor.” However, analysis of Masimo’s arguments reveals that this is not the complete construction advocated for. In argument, Masimo inserted the additional limitation that a port must be “removable.” Paper 21, p. 18. Further, Mr. Oslan added three new “port” requirements during his deposition: a port must be on a module or housing (EX1042, 27:19-28:2); a port can only be “one side” of two connectors mating (*Id.*, 30:13-31:2); and a port is not “coming from the sensor” (*Id.*, 31:14-21). None of these four additional requirements are included within Masimo’s proposed construction. Masimo’s construction is both incorrect and ever-changing.

The only consistent aspect of Masimo’s construction is their theory that all ports are removable. However, Masimo’s claim language discredits this theory. Claim 1 of the ’735 Patent claims a first sensor port, while claim 3 further specifies a removable connection between the first sensor port and a cable. Hence, the doctrine of claim differentiation refutes Masimo’s position that a port inherently includes a removable connection, a legal principal Oslan did not consider.

Environmental Designs, Ltd. v. Union Oil Co. of California, 713 F.2d 693, 699

proceeding is not disingenuous, even if Petitioner disagrees with these constructions in District Court.

(Fed. Cir. 1983); EX1042, 50:5-12. Additionally, permanent, hardwired ports exist. EX1044, p. 35. Thus, a port cannot be properly construed to require removability.

Finally, Masimo's proposed construction is inaccurate because it is broad enough to include simple electrical connections that lack data transmission. For example, a light bulb (connector) screws into (mates) a light bulb socket (compatible connector), yet a PHOSITA would not consider a light bulb socket a "port" – it is simply an electrical socket allowing the transmission of electricity, not data. EX1040, ¶ 50. Masimo's construction also includes the very thing it endeavors so vigilantly to distinguish: a hardwired connection. Indeed, a hardwired connection includes a conductor (a connector) soldered (mates) to another conductor (a compatible connector). *Id.*

Masimo's broad construction ignores the most important aspect of ports – an input/output aspect that transmits data between devices. This I/O data transmission comports with the claim language considering that all "ports" are "configured to provide wired communication." *E.g.*, EX1001, 13:32-33; *Middleton, Inc. v. Minnesota Mining and Manufacturing Co.*, 311 F.3d 1384, 1387 (Fed. Cir. 2002) (claim context is the most important evidence in construing claims). Indeed, Masimo's own extrinsic evidence mentions that ports include "an interface through which data is transferred" – an element Masimo's construction ignores. EX2021, p. 4. This I/O aspect separates a port from a power socket. The intrinsic evidence

does nothing to alter this important aspect of a port – as Masimo said, “the ’735 Patent does not specifically define the term ‘sensor communication port.’” Paper 21, p. 15.

So, a port should not be limited to a removable connection and should include an I/O aspect. Therefore, Petitioner asserts “sensor communication port” should be construed as “a permanent or removable input/output interface for a sensor.”

III. GROUND 1-4 ARGUMENTS

A. Ports Are Obvious

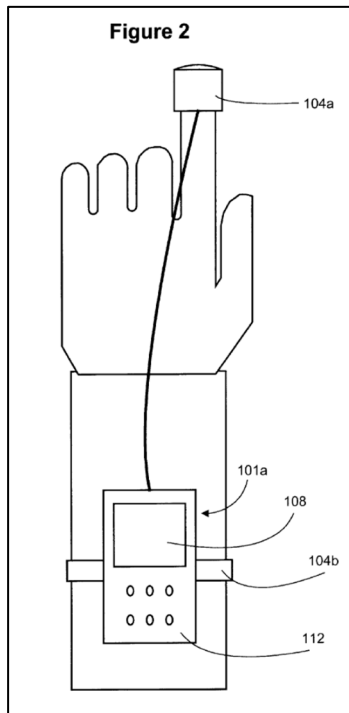
Masimo makes numerous arguments as to why Goldberg supposedly doesn’t teach ported connections, in an effort to distract from the simple conclusion that it would have been obvious to use ports on the Goldberg device because ports were common and conventional for forming wired connections. Paper 1, p. 27; EX1042, 62:13-16. So, even if Goldberg discloses only a hardwired connection, it still would have been obvious to modify Goldberg to include ports for the wired sensor connections. Masimo has not and cannot deny that there are a finite number of options (two) for forming a wired connection with a sensor: hardwire or ports. *KSR*, 550 U.S. at 418; EX1040, ¶ 61; EX1003, ¶¶ 76-78.

Further, Goldberg, at worst, implicitly teaches ported connections. EX1005, 5:6-8; *In re Preda*, 401 F.2d 825, 826 (C.C.P.A. 1968). Goldberg teaches sensors

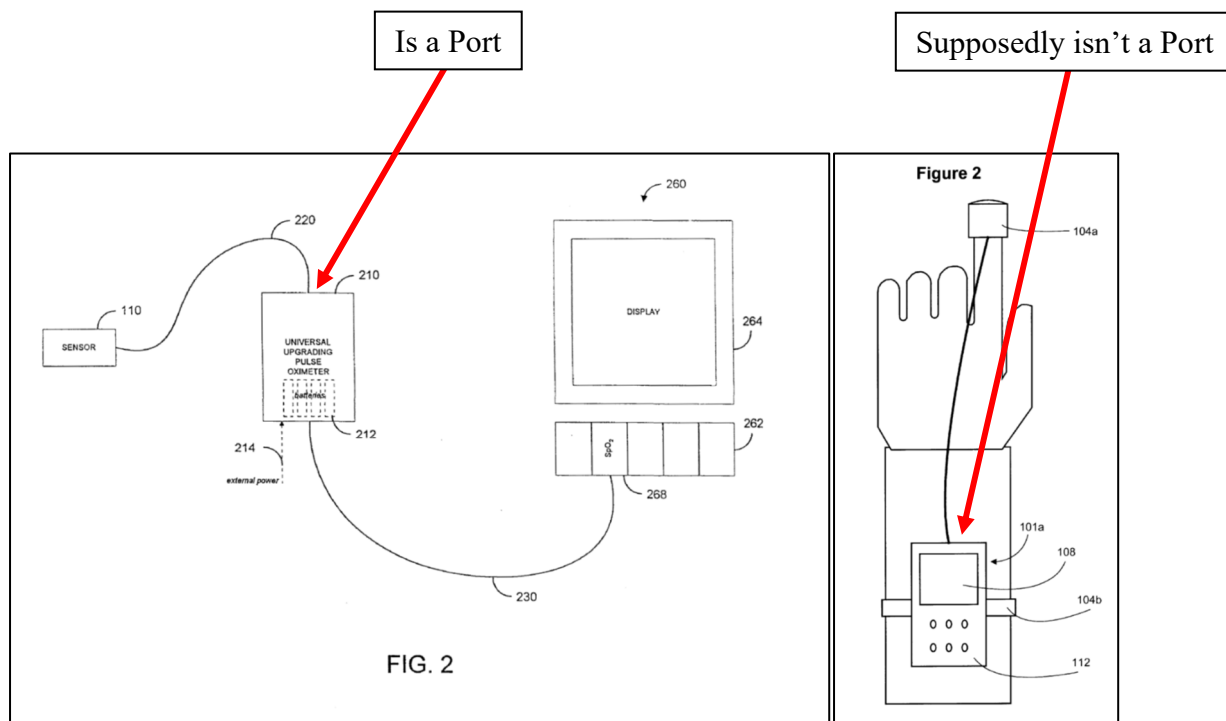
were coupled by wire, and ways for coupling (ports) are well-known. EX1005, 4:26-29; EX1006, 3:21-22. Goldberg envisioned connection with “any type of physiological sensor 104” (EX1005, 5:6-8), and port-connected sensors were a known type of physiological sensor (EX1006, 8:31-33), so Goldberg clearly envisioned making connections to sensors having ported connections. Indeed, the ubiquity of ports would lead a PHOSITA to expect ported connections in the Goldberg device. EX1003, ¶ 76; EX1040, ¶ 64.

There is no evidence that Goldberg specifically teaches hardwired connections, as Masimo contends. Paper 21, pp. 23-26. Masimo chastises Petitioner for “assuming” that Goldberg includes ported connections, yet Masimo similarly assumes a hardwired connection. *Id.*, pp. 23-24. Masimo asserts no port is taught because Goldberg doesn’t specifically use the word port, yet concurrently suggests that Goldberg teaches a wire “directly connected to a circuit board” in the absence any express teaching in Goldberg. *Id.*, p. 24. Goldberg describes wired connections, not hardwired connections. EX1005, 4:26-29.

Masimo’s only support for its hardwired conclusion comes from Goldberg FIG. 2 and its expert witness’s interpretation. Paper 21, p. 24.



Masimo makes much of this simple picture, which doesn't include details. Indeed, Goldberg describes FIG. 2 as a mere "diagram," which a PHOSITA understands does not include all electrical schematics. EX1005, 3:56-57; EX1040, ¶ 65. Additionally, Masimo's own "diagrams" that do include ports are depicted exactly like Goldberg. *Compare* Kiani, EX1006, FIG. 2 *with* Goldberg, EX1005, FIG. 2.



EX1006, 3:21-23. Masimo contradicts itself by suggesting a PHOSITA can make unequivocal, opposite conclusions about Goldberg in view of FIG. 2 even though Goldberg's diagram mirrors Masimo's in patent literature. All this to say, a simple diagram cannot be the sole basis of making conclusions like those made by Masimo.

In fact, it would make no sense for Goldberg's device to be completely hardwired. Goldberg teaches a device that communicates with "one, all, or any combination of" blood pressure, pulse, oxygen-hemoglobin saturation, glucose, body temperature, respiration, and electrolyte sensors. EX1005, 4:13-16, 4:50-56, 5:3-8. In other words, Goldberg envisions an adaptable system that accommodates connection of new sensors, replacement of sensors, or the like. *Id.*; EX1040, ¶ 68;

EX1003, ¶ 64. A hardwired system would not allow any adaptability whatsoever; and a hardwired system could not communicate with “one, all, or any combination of” Goldberg’s listed sensor types. EX1040, ¶ 68. Goldberg would not have taught this flexibility and used hardwired connections. EX1005, 4:13-16, 4:50-56, 5:3-8; EX1003, ¶ 64; EX1040, ¶ 68.

Masimo’s responds to Goldberg’s flexibility disclosures by arguing Goldberg suggests that “different models could be manufactured.” Paper 21, p. 35. If Goldberg really taught “different models” that connected to “one, all, or any of the combination of” seven different sensor types, then Goldberg would have had to manufacture at least 120 different versions. EX1040, ¶ 69. That’s far too many models to be economical or practicable. *Id.* The far more logical conclusion is that Goldberg envisioned a system with up to seven ports allowing a user to plug-and-play sensors as necessary. *Id.* Then one “model” of the device could easily connect to “one, all, or any of the combination of” the sensor types. *Id.*

Once you remove Masimo’s absolute certainty that Goldberg is unambiguously hardwired, Masimo’s arguments crumble. Petitioner’s arguments for obviousness were simple: ports were a common, conventional method for forming wired connections, and a PHOSITA would obviously be motivated to use ports for the wired connections in Goldberg. EX1005, 4:26-29. Unless Goldberg used ports, Goldberg could not communicate with “any type of physiological

sensor”; it could only communicate with very few. EX1005, 5:3-8; EX1040, ¶¶ 70-71. Masimo’s numerous arguments against this basic modification do not undercut these simple obviousness contentions.

B. Masimo Mischaracterizes the Combination of Goldberg and Kiani

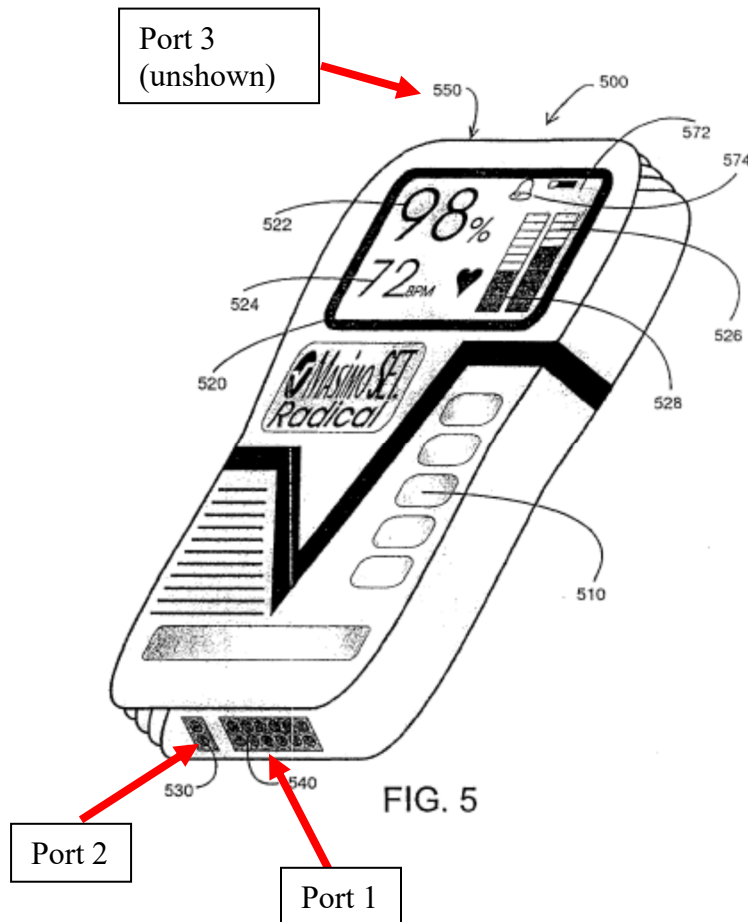
Masimo argues that Kiani does not teach multiple ports (Paper 21, pp. 26-27) but that argument is both incorrect and, more importantly, mischaracterizes the proposed combination of Goldberg and Kiani. Petitioner cited Kiani merely as evidence that ports were a known means for forming wired connections with medical sensors. Paper 1, pp. 26-27. In view of Kiani, a PHOSITA would have been motivated to make each *respective* wired connection to a sensor ported because Kiani demonstrates ports were a known and improved method for forming wired connections and adding more sensor ports is a mere duplication of parts.²

² Masimo argues against obvious duplication because each claimed port connects to a different type of sensor. Paper 21, pp. 40-41. However, the claims do not specify the mechanical structure or electrical function of the claimed ports. Indeed, the claim language is broad enough to include a “universal” port that can connect to numerous sensor types, like how a USB port universally connects to keyboards, printers, mice, etc. EX1040, ¶ 77. If Masimo intended the claimed ports to be

MPEP 2144.01(VI)(B); EX1003, ¶¶ 78-79. Thus, Kiani's number of "sensor ports" is irrelevant because Goldberg teaches multiple wired connections to sensors, and a PHOSITA would have been motivated to make *each* wired connection of Goldberg ported in view of Kiani. EX1003, ¶¶ 78-79; EX1040, ¶ 72. Masimo's insistence that Kiani teaches only a single port mischaracterizes the obviousness argument.

Regardless, Masimo is incorrect that Kiani teaches a single port. What Masimo actually argues is that Kiani only teaches a single *sensor input* port. Kiani quite clearly shows and describes three ports, at least under Masimo's construction.

different depending on the connected sensor, those differences should have been claimed. Masimo cannot now import limitations to overcome well-established obviousness rationales. MPEP 2144.01(VI)(B). Plus, Masimo's construction of port requires no mechanical or functional aspects – only that it "mates with a compatible connector." EX2010, ¶ 33; EX1042, 23:6-16, 24:3-16. Masimo cannot argue for this construction while arguing that a duplication of parts is not obvious under this generic construction.



EX1042, 115:8-116:14. Neither port 540 nor 550 is an “input” port, because both ports are bi-directional. EX1006, FIG. 3 (arrows 312, 314, 322, 324, 326 pointing in two directions).

More importantly, Masimo argues Goldberg could not possibly accommodate three ports without increasing size beyond that which could be worn on a wrist. Paper 21, p. 47. But Kiani disproves that argument, as Mr. Oslan admitted. EX1006, FIG. 5; EX1042, 116:15-117:7. Kiani easily fit three ports while being “handheld” in size. EX1006, 8:31, FIG. 5. Whether all of Kiani’s ports are connected to a sensor doesn’t change the fact that the other two ports take up

space on a housing, and Kiani figured out how to position three ports on a housing without increasing the device's size beyond "handheld," a size which easily could fit on the wrist. EX1040, ¶ 75; EX1045, p. 1. Thus, Kiani demonstrates three ports can be easily positioned on a device sized to be worn on the wrist simply by positioning the ports on multiple sides of the device. This is particularly true given that very small ports, like the 4-pin Firewire port, were known in 2002. EX1052, Abstract, 1:8-10, EX1053; EX1054; EX1055, p. 33.

The Board mentioned Masimo's arguments regarding ports increasing the size of Goldberg may have merit *if supported*, but Masimo failed to provide any support. Masimo generally suggests the size would increase (Paper 21, p. 47), but Masimo never said by *how much* they believe Goldberg's device would increase in size after including ports (if necessary). Importantly, Masimo never proved that port inclusion would somehow cause Goldberg's device to be too big for wrist attachment, Masimo merely generically suggested, without support, some increase in size. Masimo never asserted whether the Goldberg device would increase in thickness, width, weight; they just generically allude to an increase in size and complexity. Paper 21, p. 47. Even if Masimo were correct that Goldberg's device increased to accommodate a third port, such increase would be negligible.

EX1040, ¶ 76.

Finally, Masimo makes much of Dr. Yanulis' statement regarding the desirability of fewer sensors and minimized size. *E.g.*, Paper 21, p. 47. However, Dr. Yanulis simply noted this was the "best way," not the *only* way, to improve patient comfort. EX1003, ¶ 29. Further, this statement is taken out of context. Dr. Yanulis simply noted the '735 Patent *isn't* directed to the best option for increasing patient comfort. *Id.* Dr. Yanulis criticized the '735 Patent as simplistic and merely disclosing wire management. *Id.* Thus, Yanulis' statement, when taken in context, has no bearing on the proposed combinations that seek to shorten wires. Masimo's technology is *not* directed to best way to improve patient comfort, but Masimo's wire management is still an obvious way to improve patient comfort.

C. The Supposed Downsides of Ports are not Motivations Against Using Ports on Goldberg

Masimo lists a variety of supposed disadvantages with ports (accidental disconnection, ports are complicated, faulty connections, require more space, additional parts, etc.). However, Masimo's own prior art technology, Kiani, teaches ports. It's rather odd for Masimo to explain its own prior art technology uses ports, and then argue ports have huge downsides motivating a PHOSITA against their use. Clearly, these downsides are after the fact rationales that do not dissuade PHOSITAs to use ports. Further, the evidence demonstrates PHOSITAs solved any alleged downsides before 2002.

For example, in 2002, ports often included locks or tabs to securely connect cables to ports (EX1047, p. 1; EX1048, p. 3; EX1049, p. 1; EX1050, Abstract, EX1042, 88:6-89:1), shields and error checking prevented noise (EX1051, Abstract; EX1055, p. 33 (4.2.1A.1), 185 (A.2)), *see* U.S. Patent Class 439/607.01), and there is nothing complicated about plugging a wire into a slot (EX1049, p. 1). EX1040, ¶ 78. As such, Masimo's laundry list of downsides may have motivated a PHOSITA against ports in the 1950s, but not in 2002.

Despite asserting numerous downsides, Masimo never refuted the fact that ports are desirable because a faulty sensor can be removed and replaced without replacing the entire unit. EX1003, ¶ 65. Indeed, Mr. Oslan agreed this happens, mentioning disposable sensors as a reason *for* ports, which is another way of saying "removal and replacement." EX2010, ¶ 73. So, Mr. Oslan agrees with Petitioner's reasons why a PHOSITA would choose ports in 2002, even admitting using ports or hardwired connections was a simple design choice. EX1042, 67:12-68:2.

Masimo's theme is that the context of Goldberg supposedly isn't a clinical setting. Paper 21, pp. 33-34. Masimo cites to sections of Goldberg in support, but none of these cites actually support its position. EX1005, 1:6-10, 2:3-15, 3:17-24; EX1040, ¶ 79. These sections simply describe a device that is "remote" from a server. *Id.* But having a device communicate with a remote server does not indicate

the setting of the device, it only teaches the location of the server relative to the mobile device.

But even if Masimo was correct that Goldberg is a home-use device, that context would not dissuade a PHOSITA from choosing conventional ports. The average home user was very familiar with ports in 2002 – they were familiar with Ethernet ports, USB ports, telephone jacks (ports), RCA cables on TVs, coaxial cable connections, parallel ports, serial ports, etc. EX1040, ¶ 80. An average user would not be intimidated by ports or find ported connections unexpected because ports were not unusual in 2002 – if anything, they were the norm. *Id.*

Additionally, Petitioner’s motivations apply in both clinical and at-home settings, so it is unimportant where the device is used. Goldberg teaches an adaptable device that can communicate with one, all, or any combination of physiological sensors. EX1005, 4:50-56, 5:3-8. Goldberg made that statement irrespective of context. Not all patients are alike, whether in the hospital or self-monitoring at home. A patient monitoring herself desires customization so that she monitors the parameters important for her. EX1040, ¶ 81. Goldberg foresaw and described the need for customization and adaptability and designed a module that can communicate with one, all, or any combination of physiological sensors. EX1005, 4:50-56, 5:3-8. A hardwired system would not provide any flexibility of customization and would only be able to communicate with a singular set of

sensors, which is certainly not “one, all or any combination of sensors.” *Id.*;

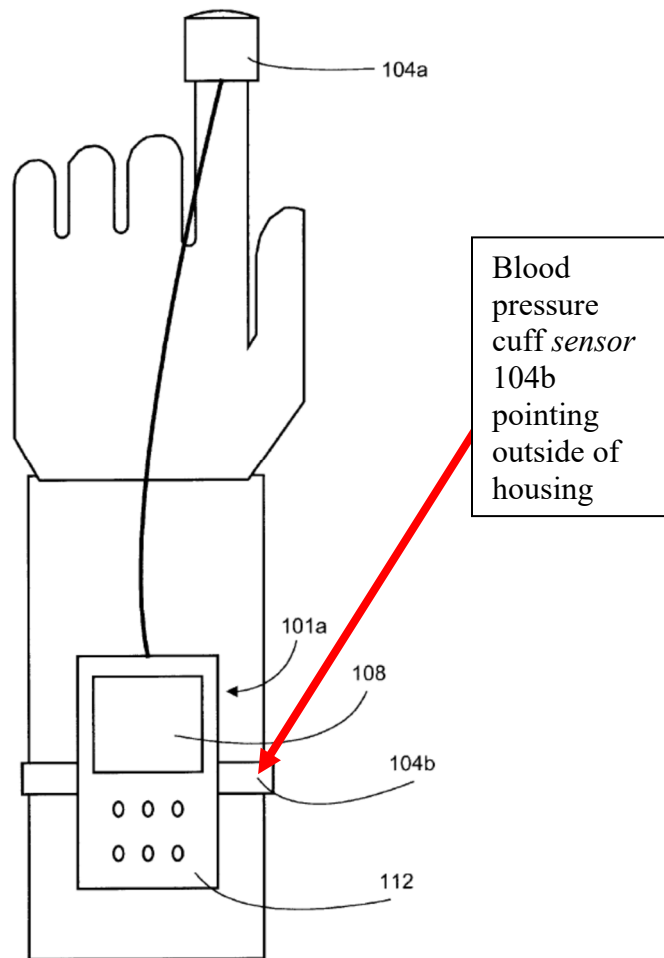
EX1040, ¶ 70.

Therefore, Goldberg certainly already included ports or, to the extent ports are not explicitly described, ported connections would have been obvious because they are the only way that Goldberg’s system could communicate with “one, all or any combination of sensors” including the “any type of physiological sensor(s),” that use ports. *Id.*

D. A PHOSITA Would Have Expected Success in Adding a Port to the Blood Pressure Sensor of Goldberg

Masimo argues a PHOSITA would not have added a port for Goldberg’s blood pressure sensor. Masimo is forced to make a lot of assumptions to support its illogical argument. Primarily Masimo assumes Goldberg’s blood pressure sensor is positioned inside the housing. Paper 21, p. 38. However, Goldberg teaches a blood pressure cuff *sensor* 104b, not just the blood pressure cuff, and Goldberg teaches and illustrates the blood pressure cuff sensor as outside of the housing. In view of the description and the figures, a PHOSITA would understand the electrical sensor is outside the device, and the sensor provides the signal to the controller 102 via a wire. EX1005, 4:26-29; EX1040, ¶ 83. Masimo suggests many blood pressure components are within the housing, while also arguing that the housing is too small for ports, which is a contradiction. EX1040, ¶ 83.

Figure 2



Additionally, FIG. 2 of Goldberg is merely “an embodiment” of the invention. EX1005, 4:59. Goldberg also discloses a more general embodiment where the controller simply connects to all sensors via wires. *Id.*, 4:23-29. Such other embodiments include separate blood pressure sensors that are not also integrated as a strap for a housing. Indeed, Goldberg envisions communicating with “any” sensor, which surely includes self-contained blood pressure sensors that

communicate via ports. *Id.*, 5:3-8. Such blood pressure systems were known.

EX1006, 16:24-33.

Finally, and alternatively, Masimo assumes the blood pressure sensor 104b in FIG. 2 is solely a pneumatic device in concluding the sensor is in the housing. However, some pneumatic blood pressure cuffs also included electrical devices, such as microphones, to detect Korotkoff sounds and more accurately detect blood pressure. EX1043, Abstract, 11:67-12:12. These blood pressure sensors place the microphone within the cuff, not in the housing. *Id.* So, even if Masimo were correct that the air pump and *pressure* sensor were all included within Goldberg's housing, the sensor would still include an electrical port to communicate with the microphone. A PHOSITA would know the microphone of the blood pressure sensor 104 cannot exist within a housing, as the housing would muffle the K-sounds, and so the microphone would need to be placed on the patient's skin for best results. EX1040, ¶ 85.

E. The Signal Configuration Claim Limitations are Blatantly Obvious

Masimo's frequently argues Money teaches the opposite data signal configuration from the one claimed. Paper 21, p. 55. However, Masimo again mischaracterizes the obviousness contention. Analog and digital signals are obvious signal variants that each transmit data. EX1003, ¶ 73. Again, this is simply

selecting one of a finite number (two) of known options. *KSR*, 550 U.S. at 418.

This is true of all sensors, including the blood pressure sensor.

Masimo does not refute the Board’s initial finding that Goldberg teaches a system that can communicate with any sensor, which would include analog and digital sensors. Paper 13, pp. 41-42. Instead, Masimo falls back on their thin argument that Money isn’t the *exact* combination of analog and digital signals, as if a PHOSITA wouldn’t be able to swap one for the other.

Secondly, claim 19 only requires that the second signal be “at least partially via digital communications,” not be a purely digital signal. EX1001, 14:63-64. It was known to encode digital information on an analog signal. EX1001, 6:59-63; EX1008, 6:8-10. So, Masimo is incorrect that a sensor would need to be replaced to transmit digital information; a PHOSITA would know an analog sensor could encode an analog signal with digital information.³ EX1040, ¶ 86.

³ Notably, Masimo does not argue Goldberg fails to teach analog and digital signals in the review associated with the ’623 Patent, even though this patent includes signal configuration limitations (*see* U.S. Patent No. 9,872,623, claim 20). EX1046. It’s not clear why Goldberg lacks these teachings for the ’735 Patent, but not the ’623 Patent. Perhaps Masimo finally realized the futility of this argument by the third Reply.

The Examiner, in his comments regarding allowability, indicated he was not impressed that the claims described SpO₂ signals specifically transmitted as analog and another parameter transmitted digitally. EX1014, p. 14. The Examiner noted he was unable to find a prior art reference that received *both types of signals simultaneously* without specifying sensor type. *Id.* However, Money discloses exactly this: receiving both analog and digital signals simultaneously. EX1008, 7:4-8. Hence, Money refutes the statement of allowance from a related application.

Ultimately, Masimo is arguing patentability *merely because they transmit data as an analog signal rather than digitally* (or vice versa). EX1003, ¶ 73. Sure, Masimo dresses up their position in technical adornment, but ultimately Masimo's argument rests on convincing the Board that it wouldn't be obvious to switch one signal type to *the only other* signal type. But such a modification is a mere reversal of parts (MPEP 2144.04(IV)(A)) or the simplest of substitutions. It's hard to imagine a more obvious modification in the electrical arts. EX1040, ¶ 86.

IV. GROUNDS 5-8 ARGUMENTS

A. Money as Primary Reference

Patent Owner argues Money cannot be a primary reference because it's allegedly too big to wear on a wrist. However, there is no test defining whether a reference can or cannot be a primary reference. Masimo cites *WBIP, LLC v. Kohler Co.* to support its position, but that case found non-obviousness due to secondary

considerations, not due to the defendant picking an improper primary reference.

WBIP, LLC v. Kohler Co., 829 F.3d 1317, 1337 (Fed. Cir. 2016).

Money discloses the same device as the claimed invention: a body-worn, multi-parameter, medical monitor. Thus, a PHOSITA would choose Money as a basis to design a wearable medical monitor. EX1040, ¶ 88.

Regarding Money's size, there is nothing indicating Money cannot be worn on a wrist. Money lists *approximate* dimensions and a *maximum* weight ("no more than sixteen ounces")⁴. EX1008, 5:6-8, 3:40-41. Thus, Money's device could be smaller and weigh less. Also, Masimo states Money's maximum length and width are the size of a modern smartphone, yet runners strap smartphones to their arms without issue or complaint. EX1040, ¶ 90-91; EX1045. Given this, Masimo's arguments suggest Money's size is perfectly fine to attach to an arm.

⁴ Notably, the '735 Patent never taught or disclosed a wrist-worn module having three ports. EX1001, 11:56-12:63. The only *wrist-mounted* module taught by the '735 Patent had one sensor port. EX1001, 5:28-61, FIG. 4A. It is more likely the multi-port module is the "clip" module that clipped onto a bedframe (EX1001, 5:48-61, FIG. 4B). Regardless, without teaching *how* they created a wrist-worn, multi-parameter module, Masimo should not be heard to criticize Money's dimensions.

Moreover, changes in size/proportion are not patentable distinctions over the prior art. MPEP 2144.04(IV)(A); *Gardner v. TEC Sys., Inc.*, 725 F.2d 1338, 1349 (Fed. Cir. 1984). So, a PHOSITA would not look to the size of Money as any sort of deterrence from making modules that attached to a person's wrist. EX1040, ¶ 90-91. Indeed, devices larger and heavier than Money's device are known for wrist attachment, even now. EX1058, p. 5; EX1059, p. 2. While these devices are not in the medical field, they do show Money's maximum size and weight are not magic numbers preventing wrist attachment. *Id.*

Further to changes in size being obvious, Money claims priority to a patent application filed in 1994, and the '735 Patent claims priority to 2002. EX1008, (63); EX1001, (60). In the nearly 10 years between Money's invention and the filing date of the '735 Patent, a PHOSITA would surely recognize Money's technology would shrink, at least according to Moore's law. EX1040, ¶ 89; EX1042, 156:9-16. Or, a PHOSITA would have been motivated to use modern technology at a subsequent date, which would have obviously resulted in a smaller device. *Id.* The point is Money's approximate dimensions would not dissuade a PHOSITA from using Money as a primary reference, especially eight years later when a PHOSITA would recognize Money's technology could improve with modern technology. *Id.*

Also, as described in the Petition, a PHOSITA would have been motivated to adapt Money's technology for wrist-attachment in view of Akai, which shows a module worn on the wrist and providing convenient access to the finger for SpO₂ readings. Paper 1, pp. 63-65; EX1003, ¶ 196. This is particularly true after seeing Akai's relationship between the SpO₂ sensor's and the module's respective positions.

Finally, Masimo also asserts, without evidence, that Money is worn on a patient's belt. However, Money specifically discloses a device "used in hospitals to monitor vital signs associated with a hospitalized patient." EX1008, 1:8-10. In hospitals, patients do not wear belts; they wear hospital gowns. EX1040, ¶ 93. Instead, knowing a hospitalized patient wears very little clothing, a PHOSITA would attach a *wearable* device to a patient's body. *Id.*; EX1008, 3:1-2, 5:4-6. Money is not specific as to which body part the device is attached to, likely because it doesn't really matter, but a PHOSITA would know there are limited options (e.g., around the neck, around the arm, or around the leg). *Id.*; EX1040, ¶ 88, 93. Hence, it would be obvious to attach this device to a patient's arm.

B. Combination with Akai

Disregarding the untenable position that converting an analog sensor to a digital sensor is outside the ordinary skill of a PHOSITA, a PHOSITA would have

been motivated to include an analog SpO₂ sensor and a digital sensor for the reasons discussed in the Petition. Paper 1, pp. 73-76.

Masimo first argues modification with Akai would result in an optical signal transferred to Money's system, and second that Money's SpO₂ sensor needs no replacing. However, neither statement fully captures nor rebuts Petitioner's proposed combination.

First, regarding Akai's cable, Akai mentions a fiber optic cable, but only as an example ("such as an optic fiber"). EX1007, 5:14-19. Masimo ignores Akai also suggests a connection of "a material having an appropriate flexibility," which a PHOSITA would know to include a wire. EX1040, ¶ 95. A PHOSITA would cause Akai's light receiver to send electrical signals if connected to an electrical conducting wire or optical signals if connected to a fiber optics cable. *Id.*

But more importantly, Petitioner never suggested modifying Money to include Akai's *cable*. Money already has a cable. EX1008, FIG. 1. Petitioner merely proposed modifying Money to include an SpO₂ sensor that does not include an uncomfortable pulse oximetry cuff and using Akai's wire *positioning*. Paper 1, pp. 63-65. However, Petitioner never asserted a PHOSITA would be motivated to replace Money's electrical wire to the SpO₂ system with a fiber optic cable taught by Akai. Masimo mischaracterizes Petitioner's grounds.

Secondly, Masimo is incorrect that a PHOSITA would not be motivated to replace the pulse oximetry cuff taught by Money with the SpO₂ sensor taught by Akai. SpO₂ *cuff* transducers, like a blood pressure *cuffs*, squeeze arteries to measure SpO₂. EX1057, Abstract, 1:42-48. Squeezing a finger to engage an artery is uncomfortable, bulky, and causes a throbbing sensation and pinching. EX1040, ¶ 96. In other words, cuffs are invasive on a person's livelihood. *Id.* Knowing that SpO₂ could be measured without a cuff to improve patient comfort, a PHOSITA would be motivated to replace Money's cuff with an analog SpO₂ sensor that accurately measures SpO₂ without engaging the artery. EX1003, ¶ 195. Such a combination not only improves patient comfort, but also removes unnecessary hardware that engages the artery. EX1040, ¶ 96.

Money teaches a system that receives a digital signal from one sensor and analog signals from other sensors. The reason Money made this decision was because it included a dual-purpose RS-232 port⁵ and a dual-purpose serial

⁵ Masimo argues Money doesn't teach an RS-232 port, again pointing only to a picture. Paper 21, p. 63. However, Money clearly explains SpO₂ data and debug data *share the same port*. EX1008, 11:51-53. Thus, Petitioner was correct that Money teaches a dual-purpose serial port. Regardless, even if Money taught

interface. EX1008, 6:15-20, 7:58-62, 11:51-53. Rather than include a superfluous serial port and interface solely used for rare debugging, Money also used the serial port and interface to receive digital data from one of the connected sensors. *Id.* Money thereby teaches a dual-purpose digital port and interface. *Id.* A PHOSITA would see value in a dual-purpose port and interface and want to keep it because debugging rarely occurs and, when it does, it occurs while not monitoring a patient. EX1040, ¶ 98-99. Hence, Money described a very efficient solution on a smaller device.

However, a PHOSITA would still want to replace the SpO₂ sensor cuff with an SpO₂ sensor that does not squeeze an artery unnecessarily. Furthermore, a PHOSITA would see value in receiving continuous data from the SpO₂ sensor. Paper 1, p. 74; EX1003, ¶¶ 224-225. Once the SpO₂ sensor became an analog sensor to transmit continuous data, a PHOSITA would have been motivated to receive digital data from another sensor via the serial port/interface to maintain the serial port/interface's dual purpose. EX1040, ¶ 98. These changes are extremely logical, comport with modern technology, and would be easily within the level of ordinary skill. EX1040, ¶ 99.

separate ports, the dual-purpose nature of the serial *interface* still justifies all of Petitioner's motivations to combine. Paper 1, pp. 74-76.

V. NO HINDSIGHT WAS INVOLVED

Masimo confuses the idea of “several proposed combinations” with “hindsight.” Mostly, Petitioner didn’t even suggest modifying Goldberg or Money, but to avoid baseless arguments, Petitioner proposed simple and obvious modifications. That isn’t hindsight.

Furthermore, there was clearly no hindsight involved because every single one of Petitioner’s proposed motivations included a citation to the prior art.

VI. ESTEP IS ANALOGOUS ART

The Petition establishes Goldberg and Money teach a border around a display, which a PHOSITA would understand is a bezel. Paper 1, p. 47, 91.

Masimo does not rebut these points.

Moreover, Masimo’s arguments that Estep is non-analogous are wrong. One of the problems facing the ’735 Patent was including a display on a wearable device. EX1001, 2:10-18. Estep was also concerned with including a display on a wearable device and teaches surrounding the display with a bezel. EX1009, 1:5-18, 4:24-25. Estep is thus reasonably pertinent to the problem the ’735 inventor was trying to solve. *Ex Parte John Lamperd & Lloyd Kaiser*, Appeal 2014-001795, 2015 WL 8166000, at *4 (P.T.A.B. Nov. 24, 2015). Moreover, surrounding the display with a bezel is one of a finite number of solutions to this problem. *Ex Parte Dinesh Mathew, Chris Ligtenberg, Brett William Degner, Thomas W. Wilson Jr.*,

& *John Brock*, Appeal 2016-002037, 2017 WL 913882, at *3 (P.T.A.B. Feb. 24, 2017).

VII. CONCLUSION

Therefore, Masimo has failed to refute the persuasive arguments that instituted *inter partes* review, and all claims of the '735 Patent are invalid.

Respectfully submitted,

Dated: May 19, 2021

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Case No. IPR2020-00954

Patent No. 9,788,735

CERTIFICATION

Pursuant to 37 C.F.R. § 42.24(c), the undersigned hereby certifies that this Petitioner's Reply, excluding the caption, Table of Contents, Table of Authorities, Table of Exhibits, Certificate of Service, and this Certification, contains 5,577 words.

Dated: May 19, 2021

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CERTIFICATE OF SERVICE

I hereby certify that on this 19th day of May 2021, I caused the foregoing to be served via electronic email to the attorneys of record for the '735 patent at the following address:

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