

Apple Inc. (Petitioner)
v.
Willow Laboratories, Inc. (Patent Owner)

Petitioner's Demonstratives

Case No. IPR2024-00296
U.S. Patent No. 10,984,911
Before Richard H. Marschall, David Cotta, and Alyssa A. Finamore
Administrative Patent Judges

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Asserted Grounds

Ground	Claims	Basis
1A	1, 6, 8, 10, 15, 17, 19-21, 26, 28	§103: Abdul-Hafiz and Raley
1B	2-4, 11-13, 23-25	§103: Abdul-Hafiz, Raley, and Secker

Petition, 1

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- Overview of Raley
- Overview of the Abdul-Hafiz and Raley Combination
- Claim Construction
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- Raley Issues
- Abdul-Hafiz and Raley Combination Issues
- Abdul-Hafiz, Raley, and Secker Combination Issues

'911 Patent

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

'911 Patent Claim 1

1. A physiological monitoring device comprising:
 - at least three LEDs recessed into a cavity, the at least three LEDs configured to emit light of at least three different wavelengths;
 - at least one detector configured to detect at least a portion of the light emitted from the at least three LEDs after at least a portion of the light has been attenuated by tissue, the at least one detector configured to output at least one signal responsive to the detected light;
 - a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is at least partially formed of a black material, wherein a top of the shoebox structure includes only one opening through which light is configured to pass, the opening comprising an area smaller than a detection surface area of the at least one detector; and
 - a processor configured to receive and process one or more signals responsive to the outputted at least one signal and determine a physiological parameter of a user responsive to the one or more signals.

EX1001, 19:36-57

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The '911 Patent

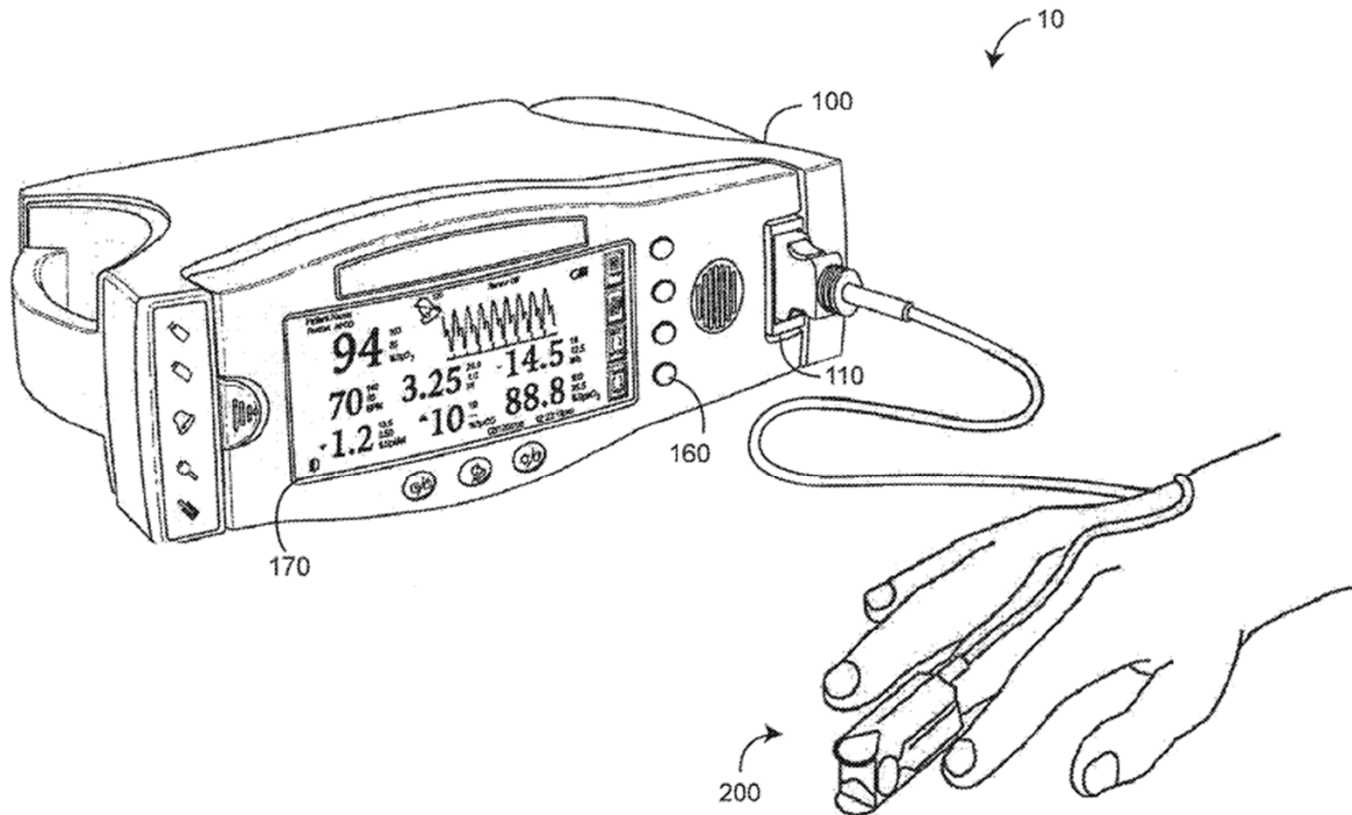
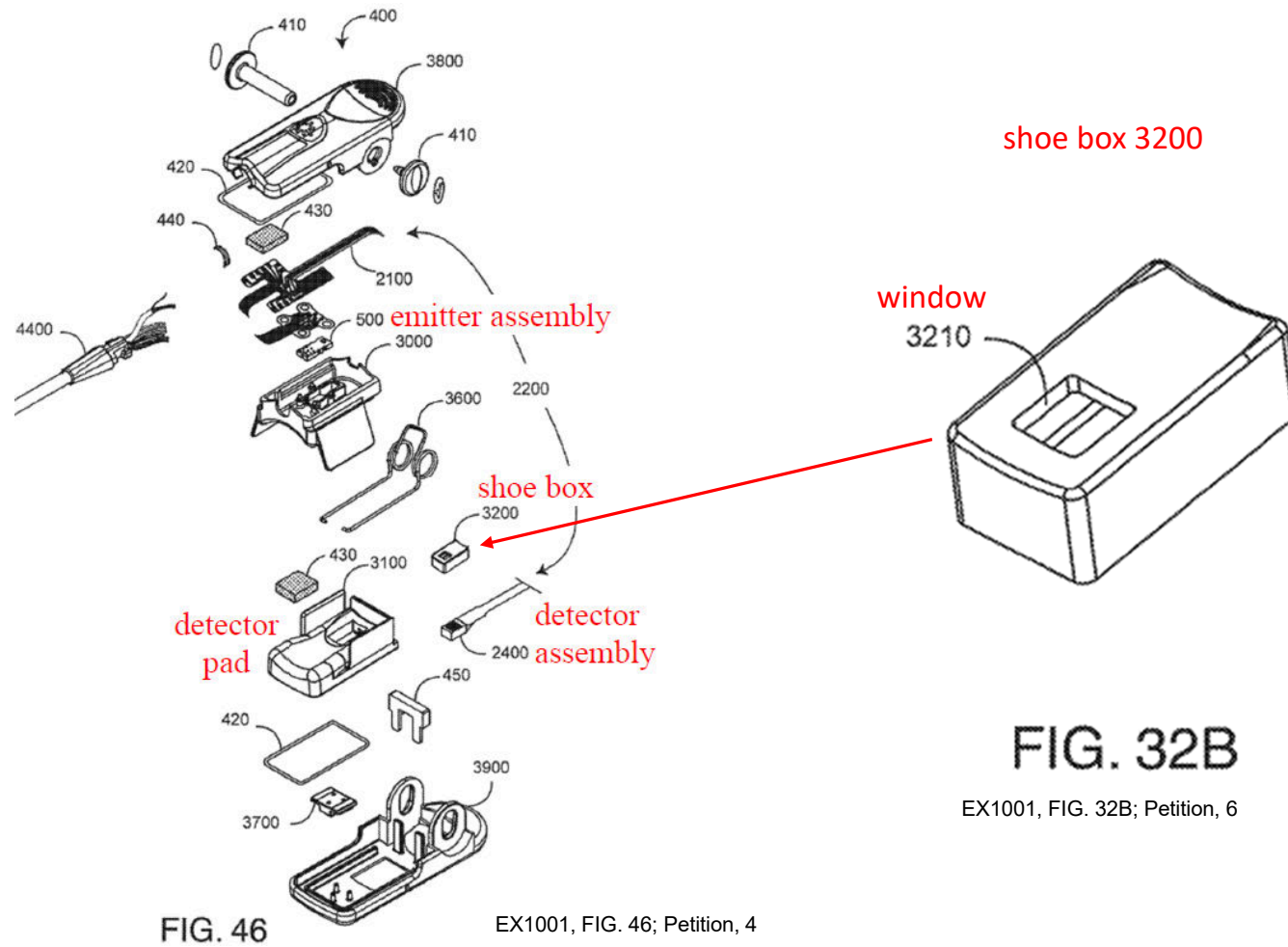


FIG. 1

EX1001, FIG. 1; Petition, 3

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The '911 Patent



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The '911 Patent

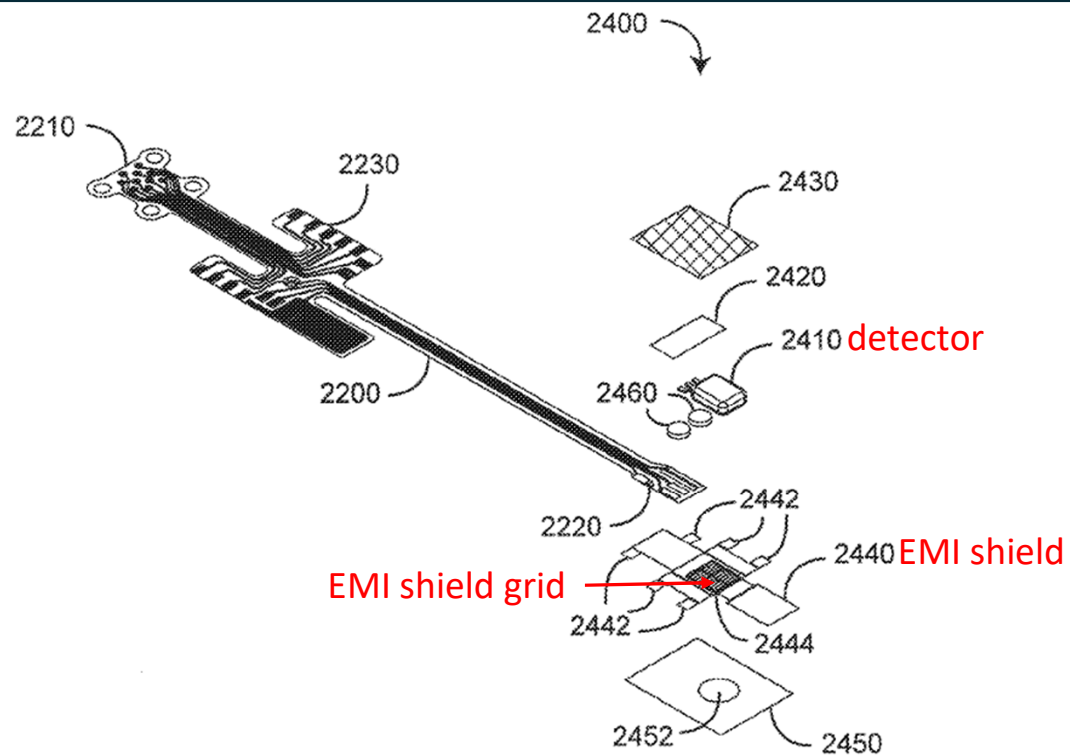
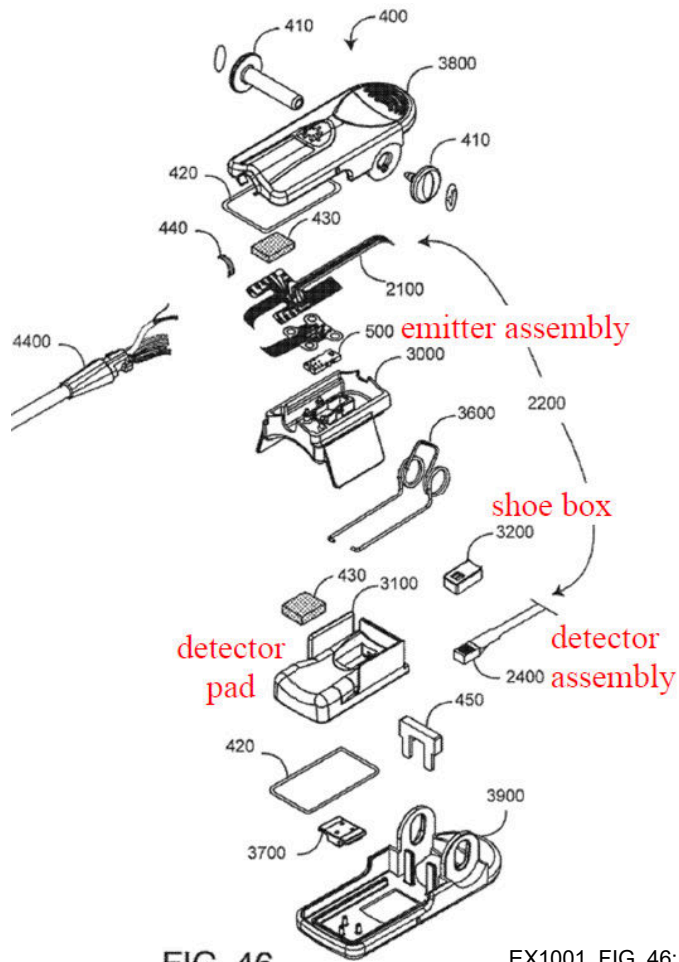


FIG. 24

EX1001, FIG. 24; Pet. Reply, 4

The '911 Patent



The detector assembly 2400 is housed in an enclosure so as to reduce light piping from the emitter assembly to the detector assembly without passing through fingertip tissue.

EX1001, 6:45-47; Pet. Reply, 5

FIG. 46

EX1001, FIG. 46; Petition, 4

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The '911 Patent

'911 patent claim 1 “detection surface area”

a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is at least partially formed of a black material, wherein a top of the shoebox structure includes only one opening through which light is configured to pass, the opening comprising an area smaller than a **detection surface area** of the at least one detector; and

EX1001, 19:45-53

Petitioner's Reply

FIG. 46 indicates to a POSITA that the “detection surface area” recited in the claims would be the **surface area of the light-detecting side of the detector.**

Pet. Reply, 5-6

Dr. Kenny

a POSITA would have understood the “detection surface area” recited in the claims to be the **surface area of the light-detecting side of the detector.**

EX1079, ¶¶25; Pet. Reply, 9

The '911 Patent

Patent Owner's Response

A POSITA would have understood that the four blue areas shown above are the detection surface area of the detector/photodiode (820/821) because the shield (1005) only permits light to reach those four areas of the detector/photodiode (820/821). EX2079 ¶¶87-88.

POR, 31

Madisetti's IPR testimony

A person of ordinary skill in the art would have understood that the four blue areas shown above are the detection surface area of the detector/photodiode (820/821) because the shield (1005) only permits light to reach those four areas of the detector/photodiode (820/821).

EX2079, ¶87; POR, 31

Madisetti's litigation testimony

It would have been readily apparent to a POSITA from the '911 Patent disclosures cited in my above table (including FIGS. 24, 32, and 46 and the accompanying description) that the '911 Patent describes that the opening in the top of a shoebox structure/light block is an opening as claimed—with an area smaller than a detection surface area of the at least one detector.

912. A POSITA would have known that the detection surface area of a given detector is essentially the entire surface area of the detector. Dr. Warren “adopted” that same understanding “for purposes of [his written description analysis].” Warren Opn. Rpt. ¶ 2449. Thus, there is no dispute that the detection surface area of a given detector is the entire surface area of the detector.

EX1082, ¶¶911-912, EX1079, ¶17; Pet. Reply, 5-6. It is clear from a review of EX1079, ¶17 that the citation to EX1082 should include ¶912 and is thus a typographical error.

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The '911 Patent

'911 patent claim 1 "only one opening"

a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is at least partially formed of a black material, wherein a top of the shoebox structure includes only one opening through which light is configured to pass, the opening comprising an area smaller than a detection surface area of the at least one detector; and

EX1001, 19:45-53

'911 patent claim 19 "only one opening"

least one detector, and a light block at least partially surrounding the at least one detector, wherein a top of the light block comprises only one opening through which light is configured to pass;

EX1001, 20:52-55

Petitioner's Reply

Apple relies on Abdul-Hafiz's low noise optical housing 400, not fixed shield 1005, for disclosing the recited light block. Pet. 35 (citing APPLE-1003, ¶¶85–87); APPLE-1004, FIGS. 4A-4C. In Abdul-Hafiz, light passes through the single aperture 470 in low noise optical housing 400 to detector 820. *Id.* at 42 (citing APPLE-1003, ¶96; APPLE-1004, Abstract, ¶¶5–7). Thus, the low noise optical housing 400 with the single aperture 470 is a light block with "only one opening." APPLE-1079, ¶14.

Pet. Reply, 3

Overview of Abdul-Hafiz

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Abdul-Hafiz

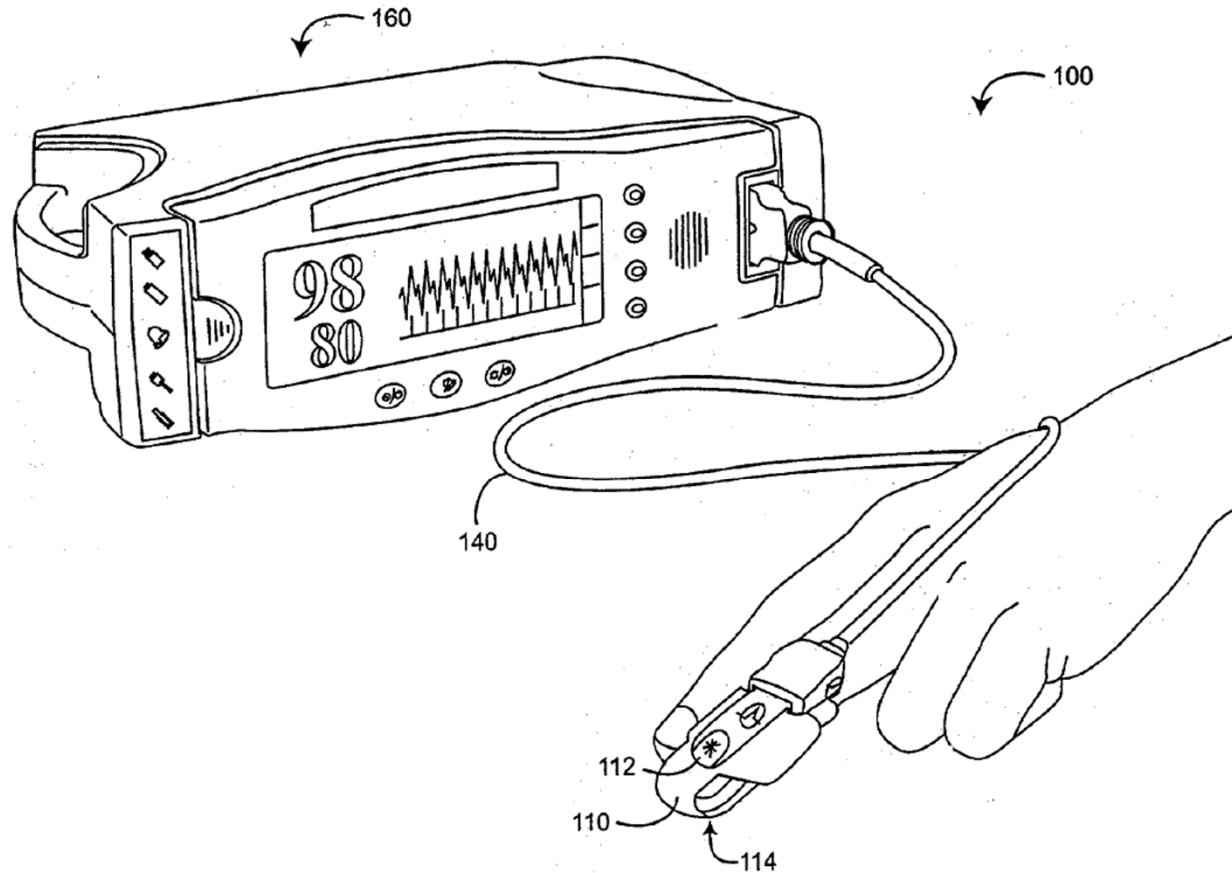


FIG. 1 (Prior Art)

EX1004, FIG. 1; Petition, 9

Overview of Abdul-Hafiz

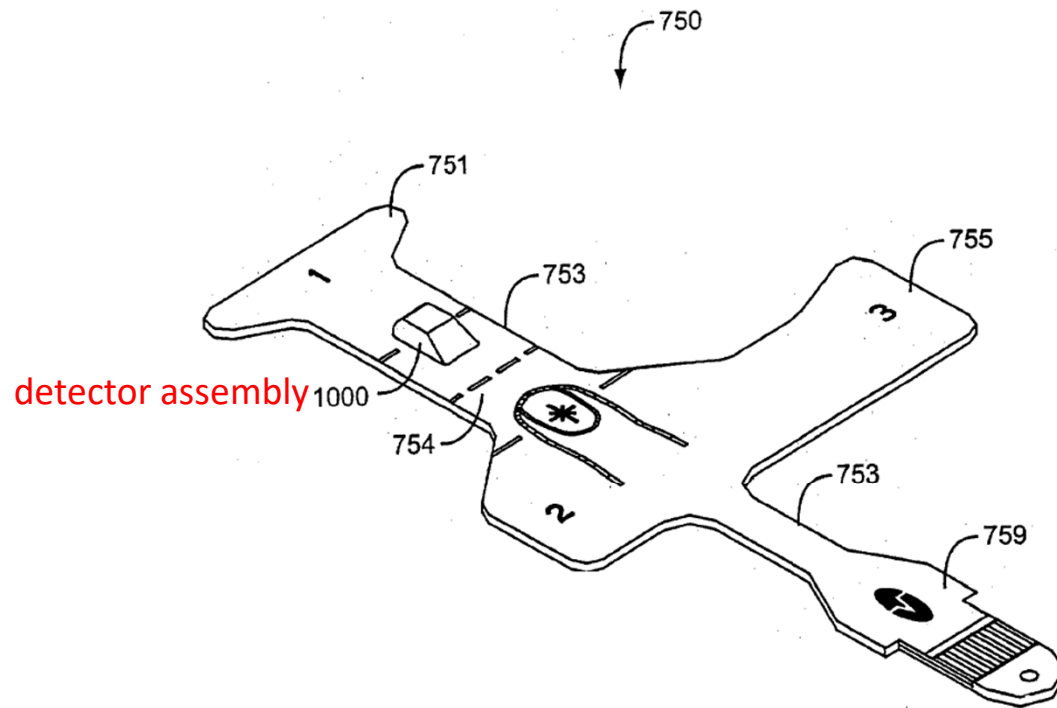


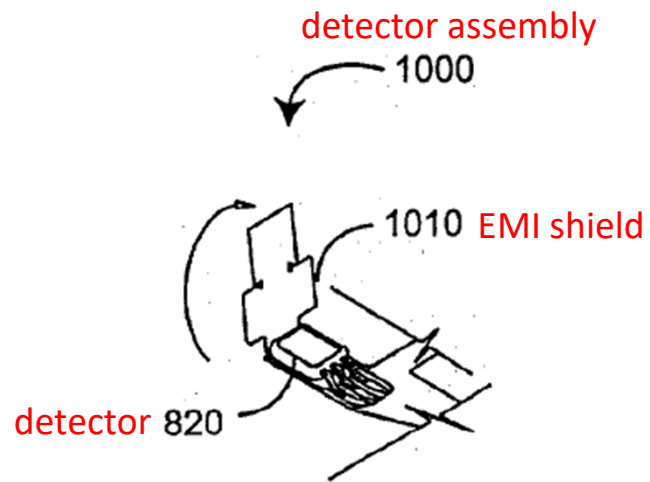
FIG. 7C

EX1004, FIG. 7C; Petition, 12

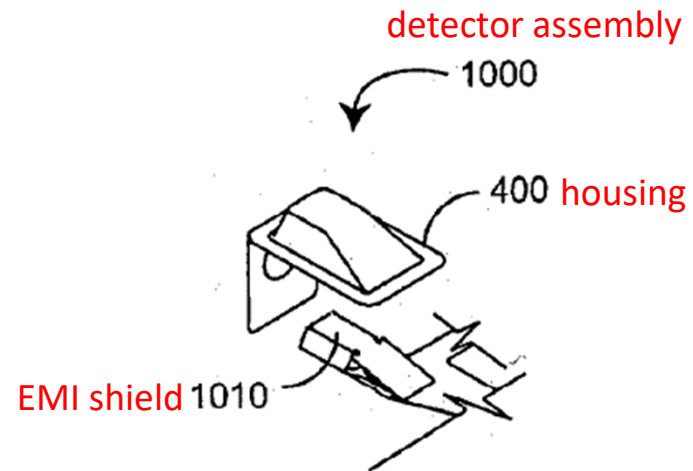
15

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Abdul-Hafiz



DETAIL A
FIG. 10B



DETAIL A
FIG. 10C

EX1004, FIG. 10B-10C; Petition, 65

Overview of Abdul-Hafiz

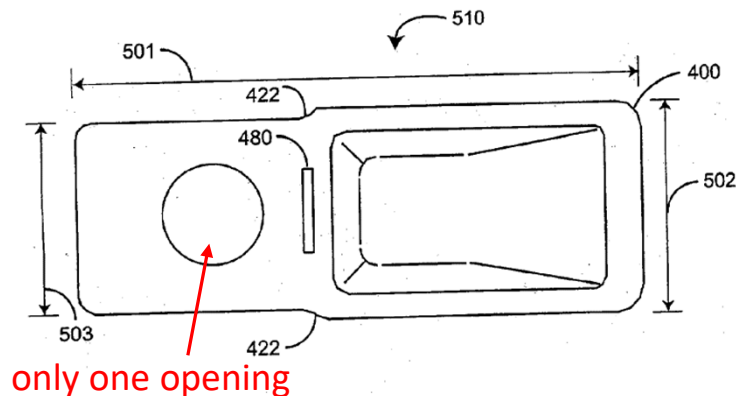
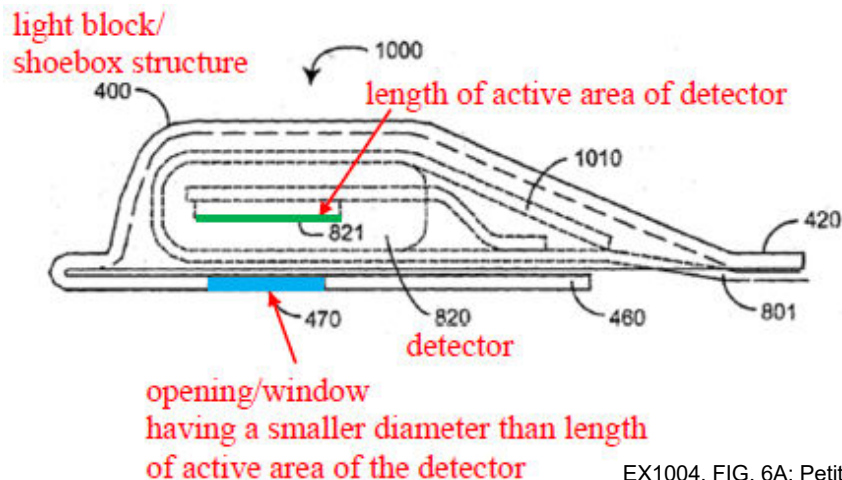
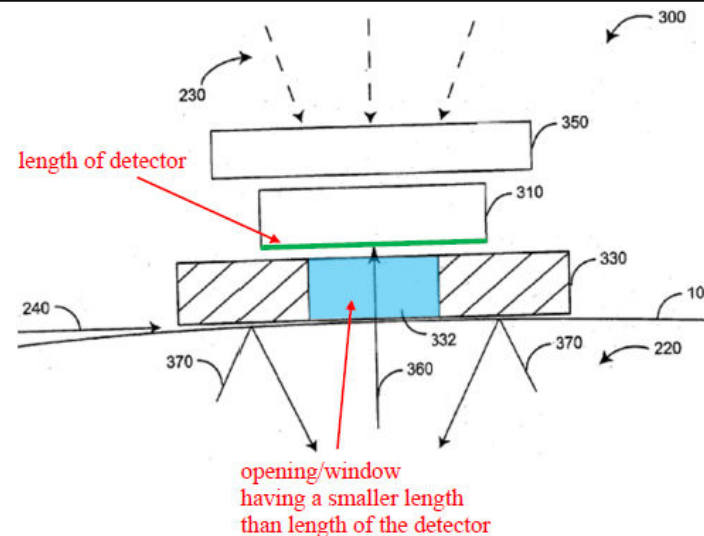


FIG. 5A EX1004, FIG. 5A; Petition, 10



EX1004, FIG. 6A; Petition, 47

[0033] FIGS. 4A-C illustrate a low noise optical housing 400 having a protruding cover 410, a generally flat flange 420 disposed around the periphery of the cover 410, and a generally flat base 460 adjoining the flange 420. The housing 400 is configured to accept a detector 820 (FIGS. 6A-B) and provide ambient light and piped light reduction. In particular, the low noise optical housing 400 advantageously incorporates the functions of a light barrier, opaque cover, spacer and aperture, as described with respect to FIG. 3, above, in a relatively small, easy to manufacture, one-piece design.



EX1004, FIG. 3; Petition, 48

EX1004, [0033];
Petition, 10

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Abdul-Hafiz

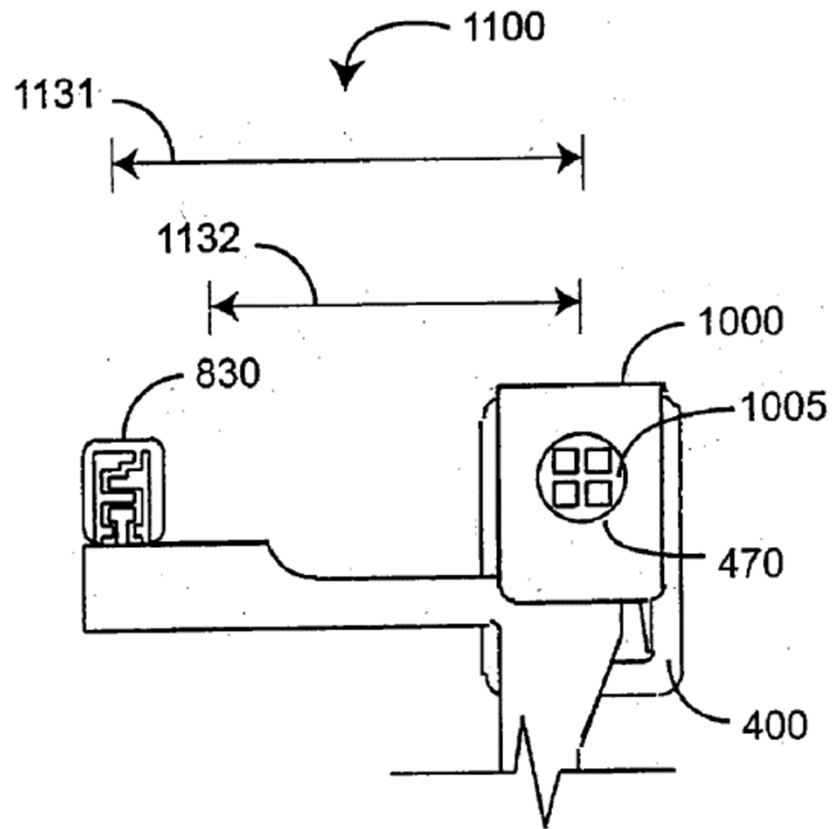


FIG. 11B

EX1004, FIG. 11B; Pet. Reply, 9

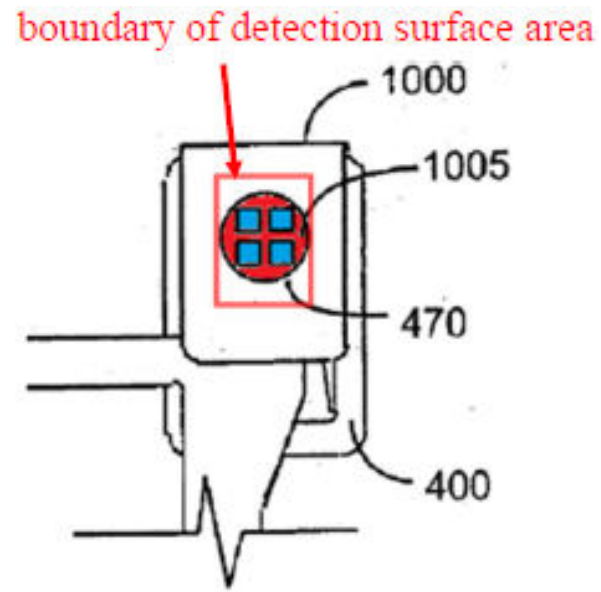
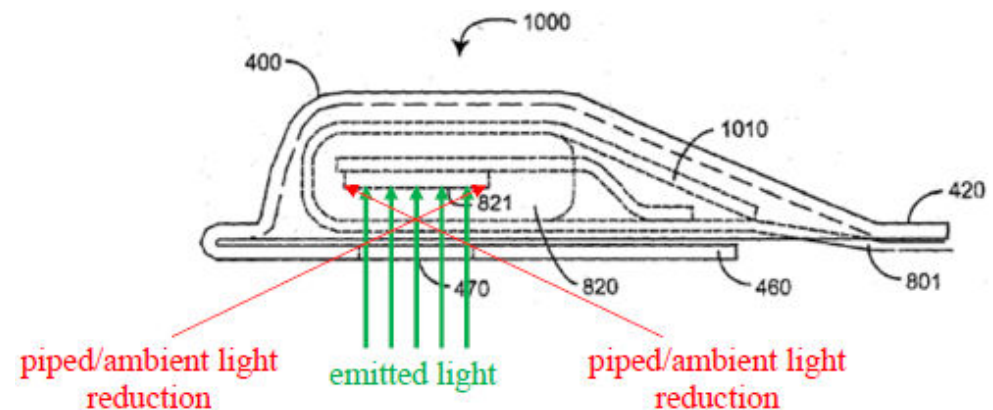


FIG. 11B

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Abdul-Hafiz

A POSITA also would have understood that such a dimensional relationship between Abdul-Hafiz's aperture and the active area of the photodiode chip 821 is consistent with Abdul-Hafiz's expressly disclosed purpose of the "low noise optical housing 400" to "provide ambient light and piped light reduction." APPLE-1004, [0033]; APPLE-1003, ¶106. That is, based on Abdul-Hafiz's disclosure, a POSITA would have understood or found it obvious that Abdul-Hafiz limiting the aperture diameter of its optical housing would desirably reduce the extraneous light entering through the opening of the housing and the finger as a light guide. *Id.*; APPLE-1004, [0003]. Indeed, as shown in the following annotated figure, limiting the aperture diameter relative to the active area of the photodiode chip 821 prevents rays from optical noise sources such as ambient light 230 and piped light 240, which are typically incident on the detector 114 at a large angle of incidence, from reaching the active area of the detector. *Id.*



EX1004, FIG. 6A

Overview of Raley

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Raley

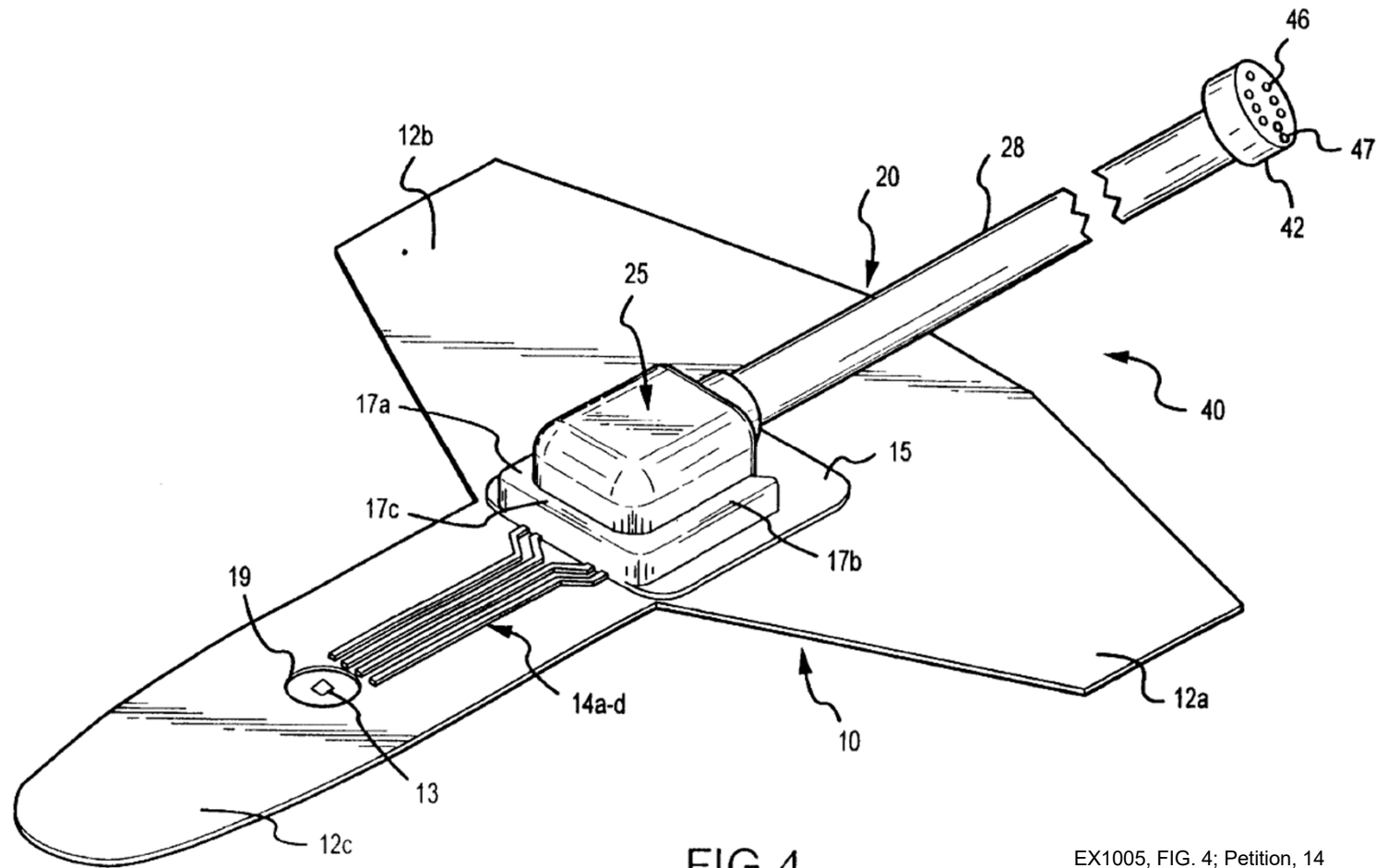


FIG. 4

EX1005, FIG. 4; Petition, 14

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Raley

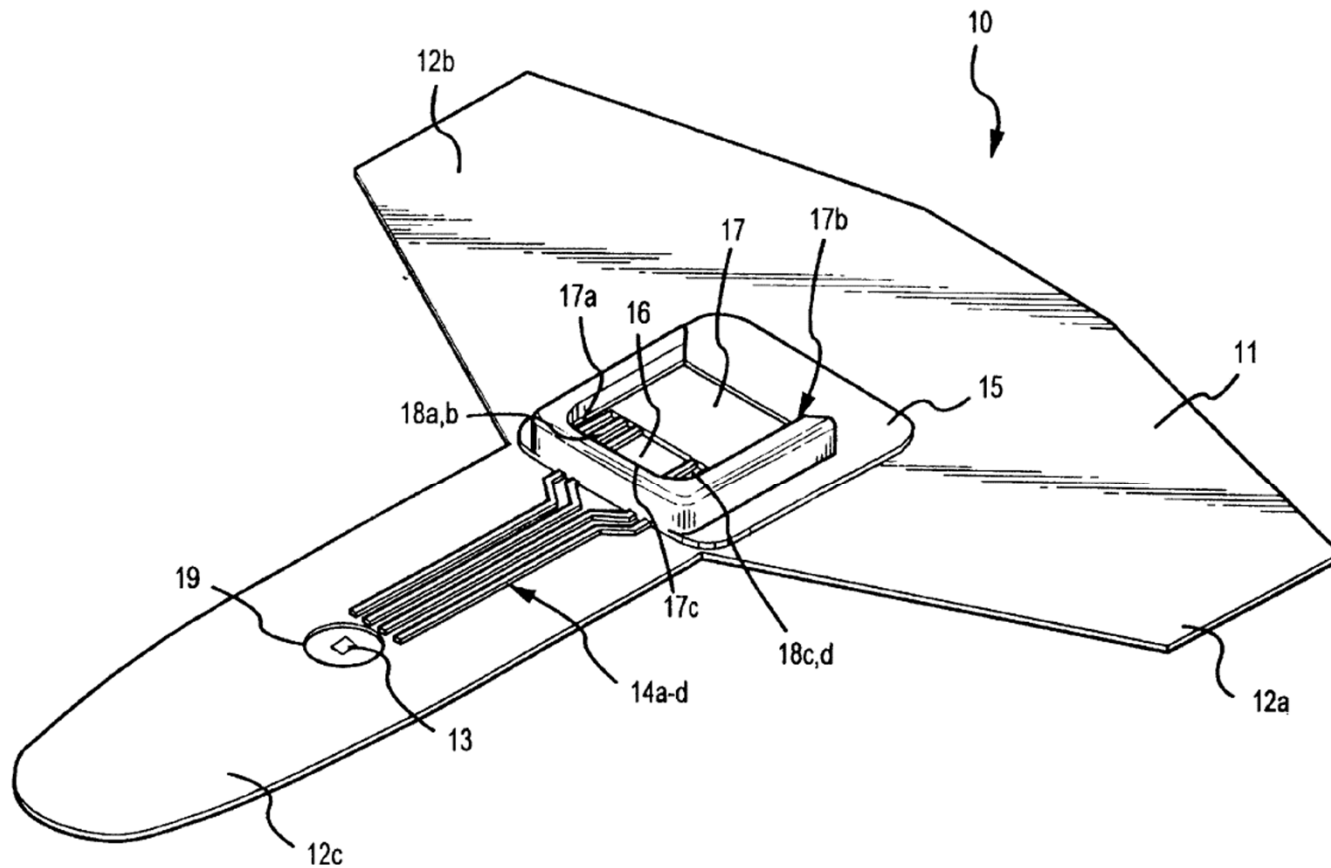


FIG. 1

EX1005, FIG. 1; Petition, 25

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Raley

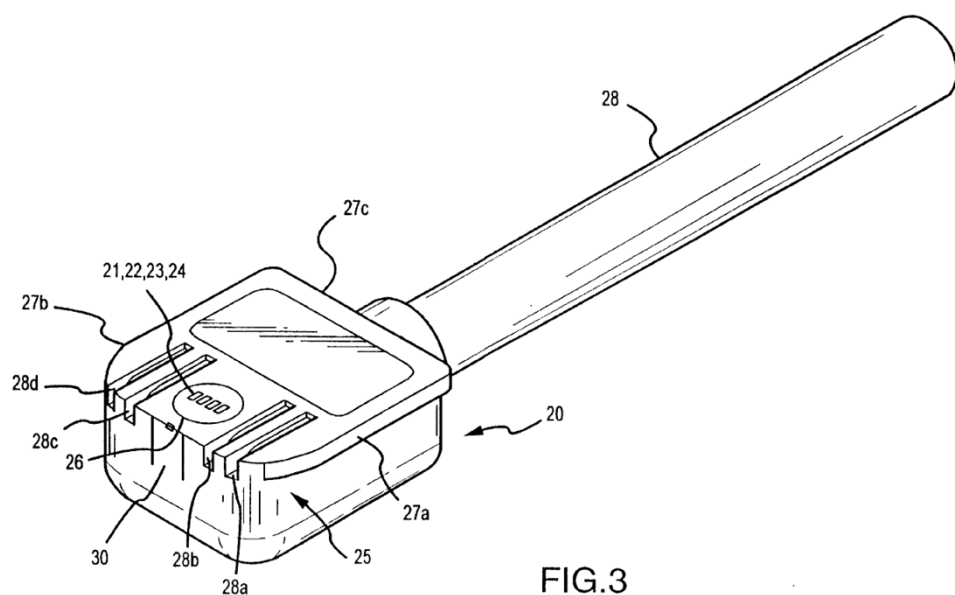


FIG.3

EX1005, FIG. 3; Petition, 14

mographic monitors continues to increase. One of the primary uses of photoplethysmography has been the monitoring of the oxygen saturation of a patient's blood. However, there is a desire to expand the use of photoplethysmography into the monitoring of additional blood analytes such as carboxyhemoglobin, methemoglobin and other dyshemoglobins. This proliferation of monitor types will add addi-

EX1005, 1:39-45; Petition, 24

oximeter instrument to perform its measurements. It is also possible to measure additional analytes in the arterial blood, such as additional dyshemoglobins, with one additional wavelength of light for each component.

EX1005, 3:33-36; Petition, 24

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Abdul-Hafiz and Raley Combination

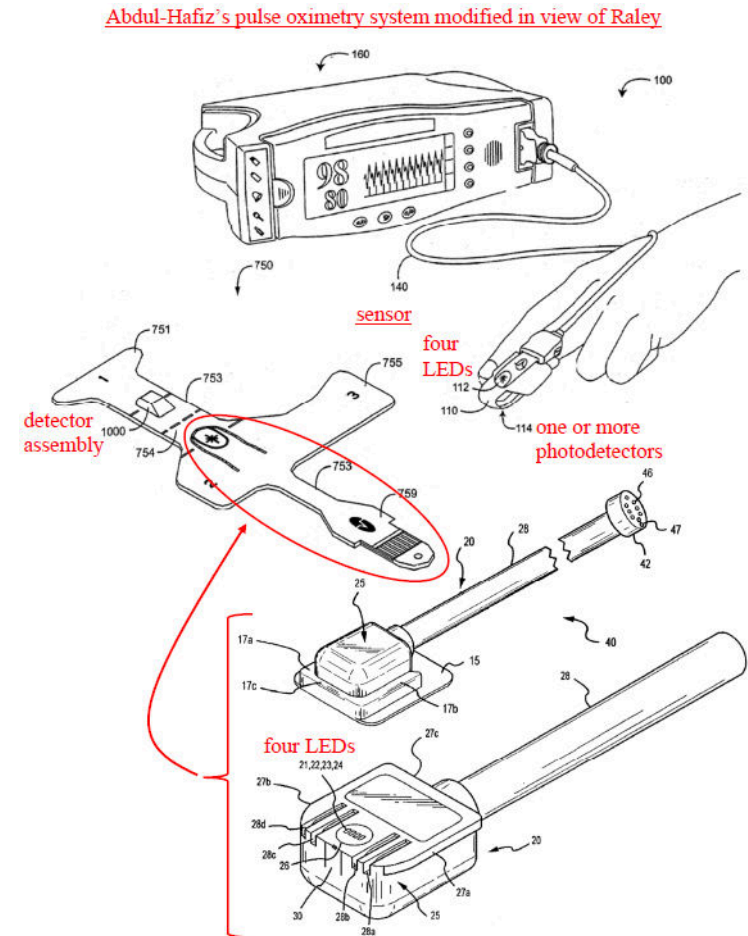
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Overview of Abdul-Hafiz+Raley Combination

A POSITA would have found it obvious and would have been motivated to incorporate Raley's teachings into Abdul-Hafiz's pulse oximetry system to expand the use of photoplethysmography into the monitoring of additional blood analytes.

APPLE-1005, 1:39-45, 3:52-4:9, 5:63-6:2; APPLE-1003, ¶67. A POSITA

Petition, 17-18



APPLE-1004, FIGS. 1, 7C; APPLE-1005, FIGS. 3, 4 (partial)

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Examiner's Reasons for Allowance

one or more signals (Col. 12 line 20-Col. 13 line 3). While Schulz et al. discloses one or more LEDs, Schulz fails to disclose at least three LEDs. Thomas et al. discloses reliable non-invasive measurement of blood gases including light emitting diodes and detector (figure 48, Col.28 line 50-Col.29 line 60). Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate the several light sources of Thomas et al. into the device of Schulz et al., since such modification provides several light sources in order to obtain multiple physiological parameters.

However, the combination of Schulz et al. in view of Thomas et al. fails to disclose a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is formed of a black material, the shoebox structure further comprising a window on a top portion of the shoebox structure, the window comprising an area smaller than a detection surface area of the at least one detector, in combination with remaining claimed features.

EX1002, 319-320; Petition, 7, 91 26

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Claim Construction

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Claim Construction

Petition

D. Claim Construction

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. Based on the well-established principal that “claim terms need only be construed to the extent necessary to resolve the controversy,” no express constructions are required to institute review and find the Challenged Claims unpatentable. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011).

Patent Owner's Response

VI. CLAIM CONSTRUCTION

The Board should give the claims their plain and ordinary 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*). In the

Abdul-Hafiz Issues

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Table of Contents: Abdul-Hafiz Issues

- **Issue 1:** Abdul-Hafiz teaches a light block with “only one opening.”
- **Issue 2:** Abdul-Hafiz discloses an opening/window with an area smaller than the detector’s detection surface area.
- **Issue 3:** Abdul-Hafiz teaches “a top.”

ISSUE 1

Abdul-Hafiz teaches a light block with
“only one opening”

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Claim Language

Claim 1

a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is at least partially formed of a black material, wherein a top of the shoebox structure includes only one opening through which light is configured to pass, the opening comprising an area smaller than a detection surface area of the at least one detector; and

EX1001, 19:45-53

Claim 19

least one detector, and a light block at least partially surrounding the at least one detector, wherein a top of the light block comprises only one opening through which light is configured to pass;

EX1001, 20:52-55

Abdul-Hafiz teaches a light block with “only one opening”

Petition

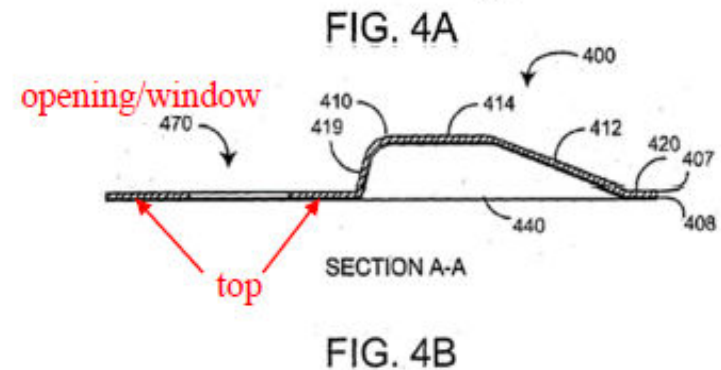
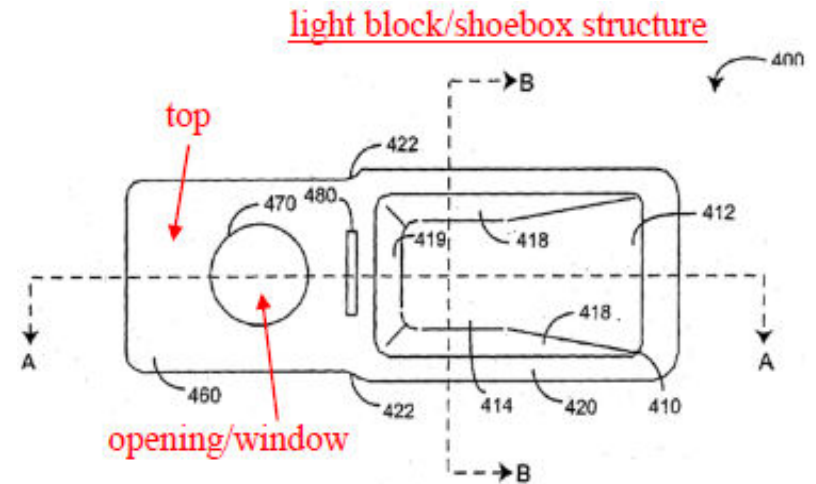
As shown in FIG. 6A, the “detector 820 is enclosed in the optical housing 400” “so that the active area of the photodiode chip 821 is aligned with the housing aperture 470” (opening/window). APPLE-1004, [0039]. From Abdul-Hafiz’s disclosure, a POSITA would have understood that the aperture 470 is the only opening through which light is configured to pass. APPLE-1003, ¶97. The

EX1004, FIGS. 4A, 4B; Petition, 43

Institution Decision

Petitioner correctly asserts that light passes through the single aperture 470 in low noise optical housing 400 to detector 820. *Id.* at 42 (citing Ex. 1003 ¶ 96; Ex. 1004, Abstract, ¶¶ 5–7). For purposes of institution, we are persuaded that Abdul-Hafiz discloses the recited only one opening in the light block.

Institution Decision, 39



EX1004, FIGS. 4A, 4B; Petition, 42

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

ISSUE 2

Abdul-Hafiz discloses an opening/window with an area smaller than the detector's detection surface area.

Claim Language

Claim 1

a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is at least partially formed of a black material, wherein a top of the shoebox structure includes only one opening through which light is configured to pass, the opening comprising an area smaller than a detection surface area of the at least one detector; and

EX1001, 19:45-53

Claim 10

a light block surrounding the at least one detector, the light block at least partially formed of black materials, the light block comprising a base, four side walls and a top forming an enclosure, wherein the light block comprises a window, the window having an area smaller than a detection surface area of the at least one detector; and

EX1001, 20:19-25

Claim 20

20. The method of claim 19, wherein an area of the opening is smaller than a detection surface area of the at least one detector.

EX1001, 21:1-3

Abdul-Hafiz satisfies this element in the same way as the '911 Patent

The '911 Patent

The detector assembly 2400 is housed in an enclosure so as to reduce light piping from the emitter assembly to the detector assembly without passing through fingertip tissue.

EX1001, 6:45-47; Pet. Reply, 5

FIGS. 32A-H illustrate a shoe box 3200 that accommodates the detector assembly 2400 (FIG. 24). A detector window 3210 provides an optical path from a tissue site to the detector 2410 (FIG. 24). A flex circuit notch 3220 accommodates the flex circuit tail 2206 (FIG. 22) routed from the emitter pad 3000 (FIGS. 30A-H). In one embodiment, the shoe box 3200 is colored black or other substantially light absorbing color and the emitter pad 3000 and detector pad 3100 are each colored white or other substantially light reflecting color.

EX1001, 15:14-23; Pet. Reply, 5

Abdul-Hafiz

[0033] FIGS. 4A-C illustrate a low noise optical housing 400 having a protruding cover 410, a generally flat flange 420 disposed around the periphery of the cover 410, and a generally flat base 460 adjoining the flange 420. The housing 400 is configured to accept a detector 820 (FIGS. 6A-B) and provide ambient light and piped light reduction. In particular, the low noise optical housing 400 advantageously incorporates the functions of a light barrier, opaque cover, spacer and aperture, as described with respect to FIG. 3, above, in a relatively small, easy to manufacture, one-piece design.

[0037] Also shown in FIGS. 4A-C, the base 460 defines a generally centered aperture 470 and a slot 480 proximate the flange 420, partially extending across the base width 503 (FIG. 5A). In a closed position, as described with respect to FIGS. 5C-D, below, the base 460 provides a bottom for the cover 410 and pocket 440 and optically shields the detector 820 (FIGS. 6A-B). The base 460 also provides a spacer and aperture to reduce light piping. The slot 480 allows the base 460 to be easily folded so that the aperture 470 is in proper alignment with the detector active area. Further, the nar-

EX1004, [0033], [0037]; Petition, 44, 46

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Abdul-Hafiz satisfies this element in the same way as the '911 Patent

The '911 Patent

FIG. 46 is a detailed exploded perspective view of a multiple wavelength sensor embodiment.

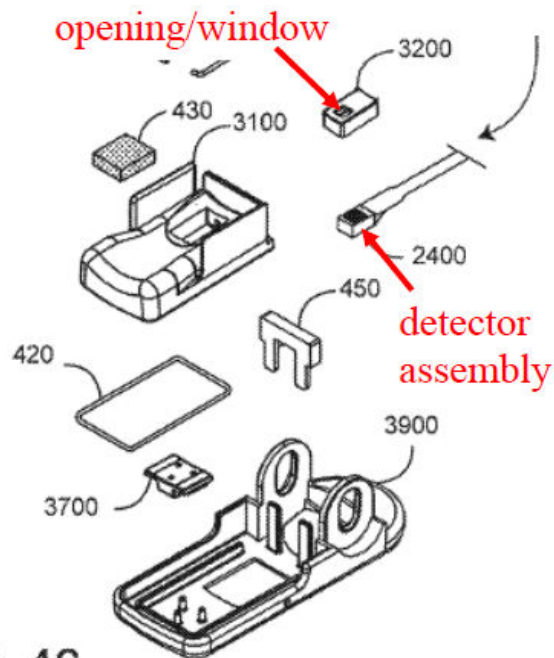


FIG. 46

EX1001, 5:13-14, FIG. 46; Pet. Reply, 5-6; EX1079, ¶22

Abdul-Hafiz

[0026] FIGS. 10A-C are detailed perspective views of an unassembled, a partially assembled and a fully assembled EMI shield, respectively, prior to low noise optical housing installation;

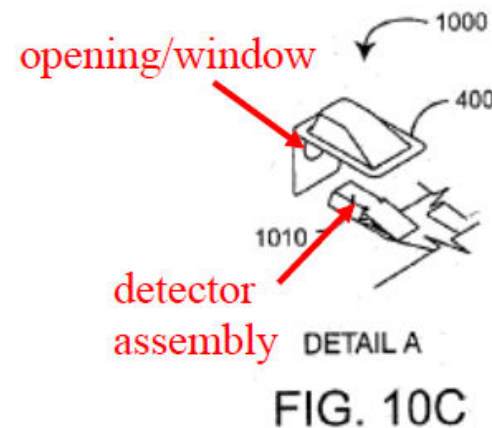


FIG. 10C

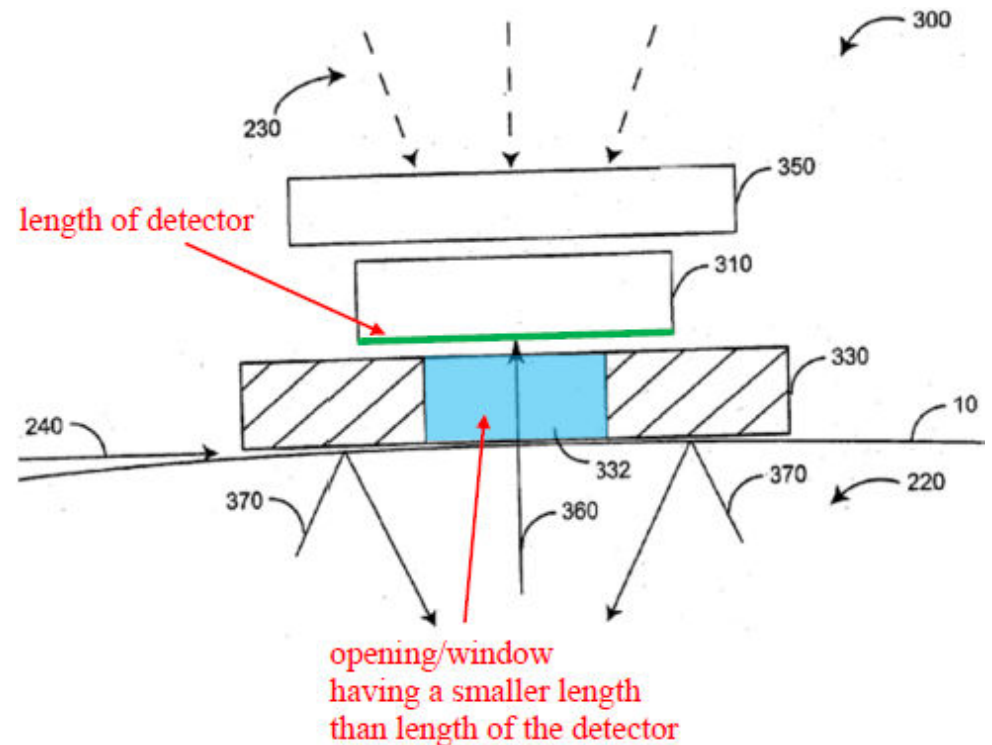
EX1004, [0026], FIG. 10C; Pet. Reply, 5-6; ; EX1079, ¶22

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Abdul-Hafiz shows an opening/window having a smaller length than the length of the detector to reduce light piping

[0004] FIG. 3 illustrates a prior art low noise sensor 300. The sensor 300 has a detector 310, a spacer 330 and an optical shield 350. The detector 310 is configured to receive light 220 that has propagated through a tissue site 10, as described with respect to FIGS. 1-2, above. The spacer 330 is positioned between the tissue site 10 and the detector 310, providing an optical barrier so as to reduce the intensity of piped light 240 that reaches the detector 310. The spacer 330 defines an aperture 332 that allows a transmitted portion 360 of propagated light 220 to reach the detector 310. A blocked portion 370 of propagated light 220 is reflected back into the tissue and/or absorbed by the spacer 330, depending upon the spacer material. The optical shield 350 may be a metal

EX1004, [0004]; Petition, 47

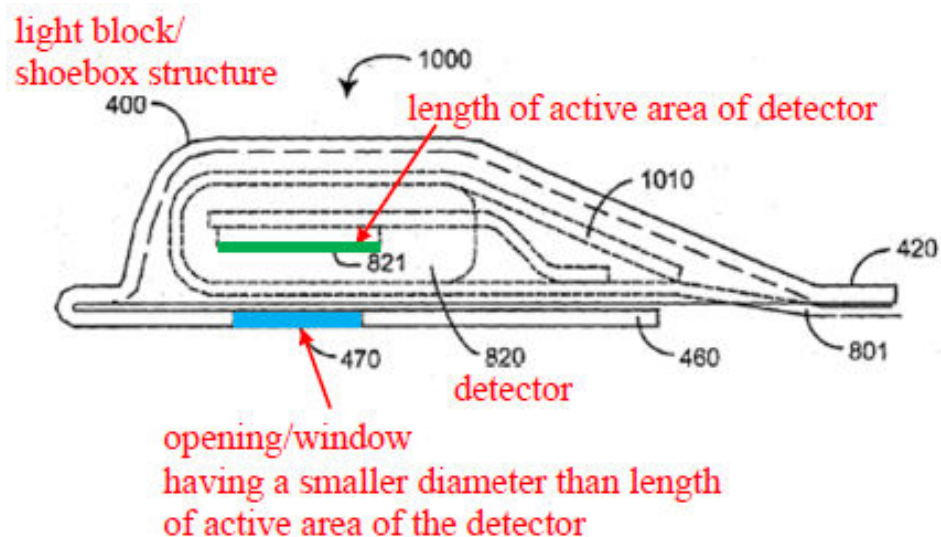


EX1004, FIG. 3; Petition, 48

Abdul-Hafiz shows an opening/window having a smaller length than the length of the detector to reduce light piping

[0033] FIGS. 4A-C illustrate a low noise optical housing 400 having a protruding cover 410, a generally flat flange 420 disposed around the periphery of the cover 410, and a generally flat base 460 adjoining the flange 420. The housing 400 is configured to accept a detector 820 (FIGS. 6A-B) and provide ambient light and piped light reduction. In particular, the low noise optical housing 400 advantageously incorporates the functions of a light barrier, opaque cover, spacer and aperture, as described with respect to FIG. 3, above, in a relatively small, easy to manufacture, one-piece design.

[0037] Also shown in FIGS. 4A-C, the base 460 defines a generally centered aperture 470 and a slot 480 proximate the flange 420, partially extending across the base width 503 (FIG. 5A). In a closed position, as described with respect to FIGS. 5C-D, below, the base 460 provides a bottom for the cover 410 and pocket 440 and optically shields the detector 820 (FIGS. 6A-B). The base 460 also provides a spacer and aperture to reduce light piping. The slot 480 allows the base 460 to be easily folded so that the aperture 470 is in proper alignment with the detector active area. Further, the nar-



EX1004, FIG. 6A; Petition, 47

EX1004, [0033], [0037]; Petition, 44, 46

Abdul-Hafiz shows an opening/window having a smaller area than the detection surface area

Petitioner's Reply

the circle. The diameter of the circle is at least as wide as the smallest dimension of the detector because no detector edges are shown. Abdul-Hafiz's FIG. 11B would have been understood to reveal that the width is at least as wide as the diameter of the circular aperture and, given that the length is known from FIGS. 6A and 3 to be longer than the diameter of the circular aperture, the detection surface area is larger than the surface area of the aperture, as illustrated by the red boundary outline of the detection surface area in FIG. 11B below. EX2080, 114:8-14 ("outer boundaries of the detector are not shown").

Pet. Reply, 8

Dr. Kenny

explained above, a POSITA would have understood the "detection surface area" recited in the claims to be the surface area of the light-detecting side of the detector.

EX1079, ¶25; Pet. Reply, 9

boundary of detection surface area

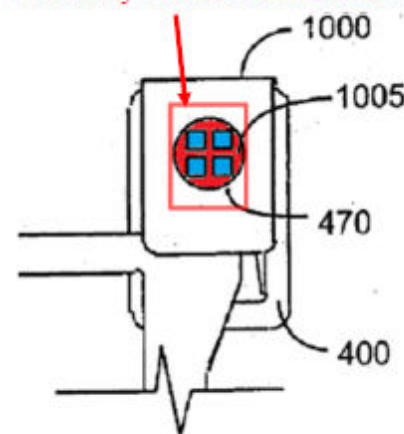


FIG. 11B

EX1004, FIG. 11B; Pet. Reply, 9

Dr. Madisetti

912. A POSITA would have known that the detection surface area of a given detector is essentially the entire surface area of the detector. Dr. Warren "adopted" that same understanding

EX1082, ¶912, EX1079, ¶17; Pet. Reply, 5-6

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

ISSUE 3

Abdul-Hafiz teaches “a top”

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Claim Language

Claim 1

a light block surrounding the at least one detector, the light block comprising a shoebox structure configured to recess the at least one detector into the shoebox structure, wherein the shoebox structure is at least partially formed of a black material, wherein a top of the shoebox structure includes only one opening through which light is configured to pass, the opening comprising an area smaller than a detection surface area of the at least one detector; and

EX1001, 19:45-53

Claim 10

a light block surrounding the at least one detector, the light block at least partially formed of black materials, the light block comprising a base, four side walls and a top forming an enclosure, wherein the light block comprises a window, the window having an area smaller than a detection surface area of the at least one detector; and

EX1001, 20:19-25

Claim 19

least one detector, and a light block at least partially surrounding the at least one detector, wherein a top of the light block comprises only one opening through which light is configured to pass;

EX1001, 20:52-55

Abdul-Hafiz teaches “a top”

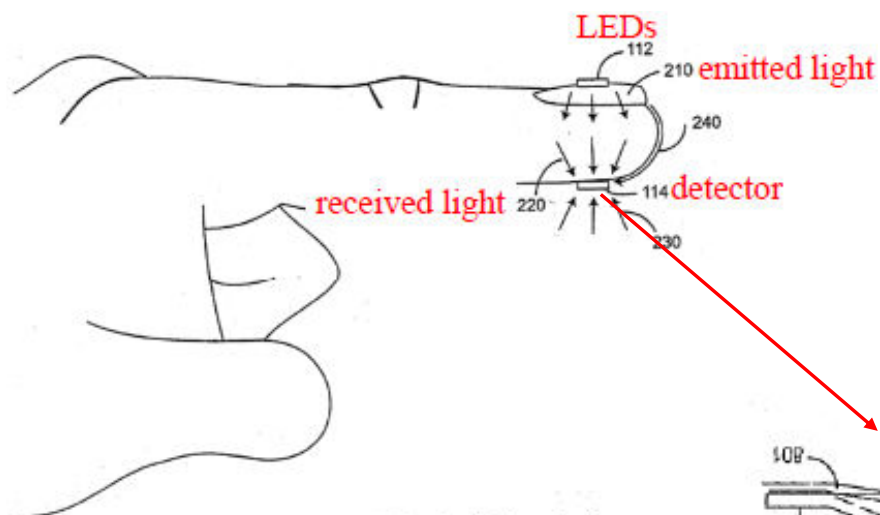
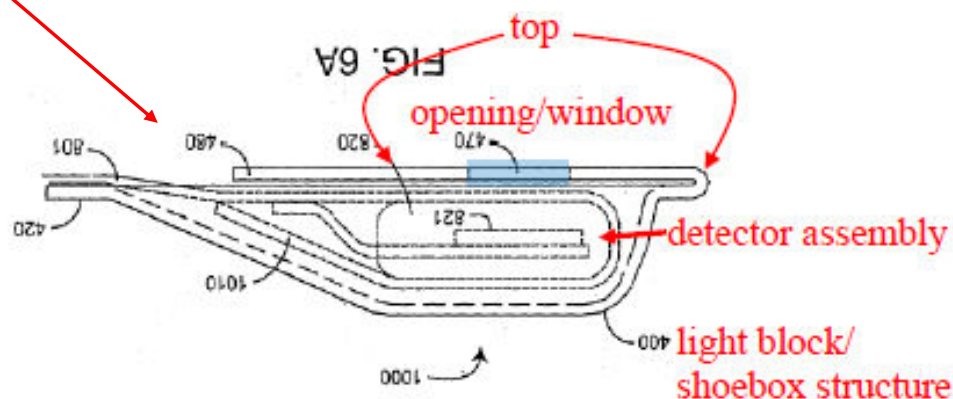


FIG. 2 (Prior Art)

EX1004, FIG. 2; Petition, 33



EX1004, FIG. 6A (rotated); EX1079, ¶12; Pet. Reply, 2

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

The Board agreed that Abdul-Hafiz teaches “a top”

Institution Decision

We agree with Petitioner that, **in use**, Abdul-Hafiz’s low noise optical housing 400 is positioned below a tissue site, e.g., a patient’s finger, to allow light passing through the tissue site to pass through aperture 470 in base 460 to detector 820 enclosed within low noise optical housing 400, making the portion of **base 460 with aperture 470 the uppermost portion** of low noise optical housing 400 enclosing detector 820. Prelim. Reply 4 (citing Ex. 1004, Fig. 6A). Accordingly, at this stage of the proceeding, giving the claim term “a top” its plain and ordinary meaning, Petitioner has sufficiently identified “a top” of the shoebox structure/light block in Abdul-Hafiz.

Institution Decision, 37

Raley Issues

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Table of Contents: Raley Issues

- **Issue 4:** Raley teaches a “cavity.”
- **Issue 5:** Raley enables measuring blood analyte levels using four LEDs.

ISSUE 4

Raley teaches a “cavity”

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Claim Language

Claim 1

at least three LEDs recessed into a cavity, the at least three LEDs configured to emit light of at least three different wavelengths;

EX1001, 19:37-39

Claim 10

at least three LEDs recessed into a cavity, the at least three LEDs configured to emit light of at least three different wavelengths;

EX1001, 20:9-11

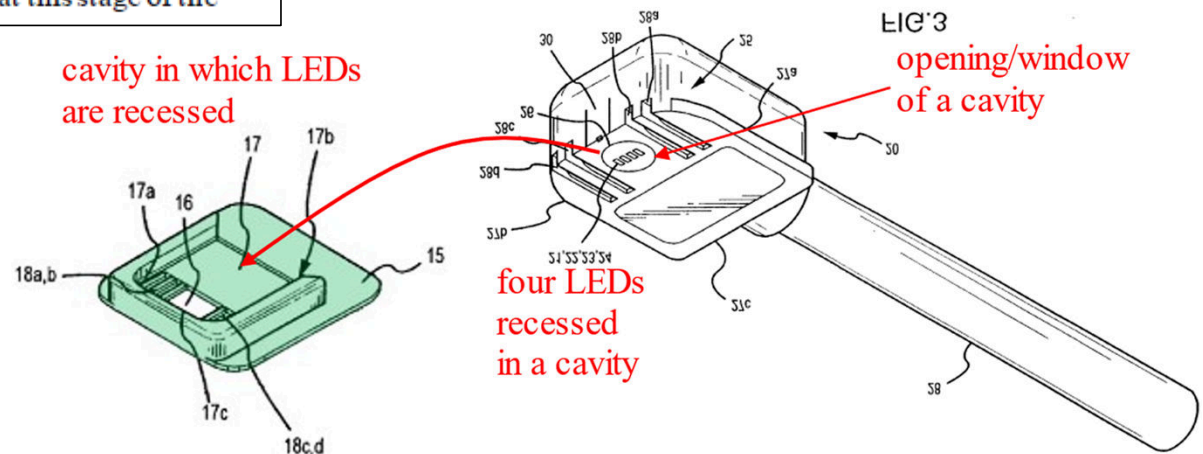
Raley teaches a “cavity”

Institution Decision

We agree with Petitioner that, in order for emitters 21, 22, 23, 24 to be flush with opening 26, emitters 21, 22, 23, 24 must be recessed in a hollowed-out space in connector-end 25 to accommodate the thickness of the emitters. Prelim. Reply 5. We also agree with Petitioner that interconnect cable segment 20 and probe-end 10 being separable components is irrelevant because each of connector-end 25 and connector 17 is a solid body having a pre-existing hollowed-out space that receives emitters 21, 22, 23, 24 when interconnect cable segment 20 and connector 17 are combined. *Id.* at 5–6. Accordingly, at this stage of the

Institution Decision, 35-36

EX1005, FIGS. 1, 3; EX1079, ¶¶10-11; Pet. Reply 2



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

ISSUE 5

Raley enables measuring blood analyte levels using four LEDs

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Raley is presumed to be enabling

Amgen Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1354-55 (Fed. Cir. 2003)

source for a presumption. Instead, relying on our precedent, we hold a presumption arises that both the claimed and unclaimed disclosures in a prior art patent are enabled.

Pet. Reply, 13

Raley

blood. The pulse oximeter instrument makes use of a plurality of light-emitting devices, each of which transmits light at a predetermined wavelength, which wavelengths are selected such that at least one is highly absorbed by oxygenated hemoglobin in the arterial blood and at least one is highly absorbed by reduced hemoglobin in the arterial blood. The amount of absorption of the light beams gener-

EX1005, 3:17-23; Petition, 13

FIG. 3 depicts a bottom elevational view of one embodiment of the patient end of interconnect cable segment 20. The embodiments of FIG. 3 includes four emitters 21, 22, 23 and 24. Such an embodiment would be useful in a photoplethysmographic monitor for measuring three or four blood analytes such as oxyhemoglobin, deoxyhemoglobin, carboxyhemoglobin and methemoglobin. Alternatively, the

EX1005, 5:63-6:2; Petition, 15, 55

oximeter instrument to perform its measurements. It is also possible to measure additional analytes in the arterial blood, such as additional dyshemoglobins, with one additional wavelength of light for each component.

EX1005, 3:33-36; Petition, 13

Masimo has the burden to show undue experimentation

Liberty Mutual Ins. Co. v. Progressive Casualty Ins. Co., CBM2013-00009, Paper 68, 39 (PTAB Feb. 11, 2014)

The test for determining enabling disclosure under 35 U.S.C. § 112, first paragraph, is whether one of ordinary skill in the art could make or use the claimed invention from the disclosed subject matter together with information in the art without undue experimentation. *United States v. Teletronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988). A disclosure can be enabling even though some experimentation is necessary. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384 (Fed. Cir. 1986). The issue is whether the amount of required experimentation is undue, not whether any experimentation is necessary. *In re Vaeck*, 947 F.2d 488, 495 (Fed. Cir. 1991). *In re Angstadt*, 537 F.2d 498, 504 (CCPA 1976). The

Pet. Reply, 13

In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988)

The term "undue experimentation" does not appear in the statute, but it is well established that enablement requires that the specification teach those in the art to make and use the invention without undue experimentation. [23] Whether undue

Pet. Reply, 13

Amgen, Inc. v. Chugai Pharm. Co., 927 F.2d 1200, 1212 (Fed. Cir. 1991)

875, 93 L. Ed.2d 829 (1987). "To be enabling under § 112, a patent must contain a description that enables one skilled in the art to make and use the claimed invention." *Atlas Powder Co. v. E.I. duPont De Nemours & Co.*, 750 F.2d 1569, 1576, 224 USPQ 409, 413 (Fed. Cir. 1984).

That some experimentation is necessary does not constitute a lack of enablement; the amount of experimentation, however, must not be unduly extensive. *Id.* The

PO Sur-reply, 15

In re Antor Media Corp., 689 F.3d 1282, 1290 (Fed. Cir. 2012)

The PTO responds that Antor has not met its burden to show that undue experimentation would be required for one of ordinary skill in the art to make or use the invention in the '961 patent. It argues that forward-looking language is irrelevant to enablement and that Antor ignores the level of skill in the art, merely pointing to some missing details in the Ghafoor disclosure. We agree with the PTO that Antor has not shown that undue experimentation would be required to perform the claimed invention based on the teaching in Ghafoor.

Pet. Reply, 13

52

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Masimo did not meet its burden of showing undue experimentation

Patent Owner Response

Before the '911 Patent, no one had developed a device that could do what Apple proposes. By seeking to measure the identified analytes using four wavelengths of light, Apple proposes making Abdul-Hafiz's pulse oximeter into a *different device*—a pulse *CO-oximeter*. EX1011, 45; EX2079 ¶109. But *Masimo* was the first to make such a device, the Rad-57™ pulse CO-oximeter, which was not released or even announced until after the '911 Patent. EX2046 (March 2005

POR, 41

EX2079 ¶111. While Raley speculates about what the future of noninvasive monitoring “will” hold, it never explains how to measure these four blood analytes using only four wavelengths of light. EX1005; EX2079 ¶111. That should not be surprising because no such device existed at the time of the '911 Patent.

Second, Apple relies on Jarman (a non-ground reference). Pet. 18-20, 55-59. Jarman, like Raley, merely states that four LEDs of different wavelengths theoretically “could” be used to measure the concentration of four analytes—“O₂Hb

POR, 43

In re Donohue, 766 F.2d 531, 533 (Fed. Cir. 1985)

Accordingly, even if the claimed invention is disclosed in a printed publication, that disclosure will not suffice as prior art if it was not enabling. *In re Borst*, 345 F.2d 851, 855, 145 USPQ 554, 557 (CCPA 1965), cert. denied, 382 U.S. 973, 86 S.Ct. 537, 15 L.Ed.2d 465 (1966). It is not, however, necessary that an invention disclosed in a publication shall have actually been made in order to satisfy the enablement requirement.

Pet. Reply, 14; PO Sur-reply, 15-16

In re Antor Media Corp., 689 F.3d 1282, 1289-90 (Fed. Cir. 2012)

As an initial matter, the mere use of forward-looking language (such as terms like “should”) does not show one way or another whether a person of ordinary skill in the art would have to engage “undue experimentation to perform the claimed invention. Indeed, undue experimentation is determined based on both the nature of the invention and the state of the art. See *Elan Pharm., Inc. v. Mayo Found. for Med. Educ. & Research*, 346 F.3d 1051, 1055 (Fed.Cir.2003) (quoting *In re Wands*, 858 F.2d 731, 737 (Fed.Cir. 1988)). The word “should” thus constitutes a disclosure even if it is only precatory and does not necessarily convey the meaning of “did.” Thus, the verb tense and word choice used in a prior art reference, taken without an understanding of the state of the art and the nature of the invention, shed no light on enablement. That reality is consistent with our precedent holding that the invention in a prior art publication need not have actually been made or performed to satisfy enablement. *Novo Nordisk Pharm., Inc. v. Bio-Tech. Gen. Corp.*, 424 F.3d 1347, 1355 (Fed.Cir. 2005); *In re Donohue*, 766 F.2d 531, 533 (Fed.Cir.1985).

Pet. Reply, 13-14

53

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Masimo did not meet its burden of showing undue experimentation

PO Sur-reply

Apple did not show *any* device or method that could measure the Apple-identified analytes with four wavelengths of light. *Id.*

Apple also argues references need not have been “made” to be enabled. Reply, 14. But Apple ignores that *only Masimo was able to* measure the Apple-identified analytes, and Masimo used eight wavelengths—not four—to do so. POR, 41-42. This is “strong evidence that the [prior art] was nonenabling” of measuring

PO Sur-reply, 15-16

In re Donohue, 766 F.2d 531, 533 (Fed. Cir. 1985)

Accordingly, even if the claimed invention is disclosed in a printed publication, that disclosure will not suffice as prior art if it was not enabling. *In re Borst*, 345 F.2d 851, 855, 145 USPQ 554, 557 (CCPA 1965), cert. denied, 382 U.S. 973, 86 S.Ct. 537, 15 L.Ed.2d 465 (1966). It is not, however, necessary that an invention disclosed in a publication shall have actually been made in order to satisfy the enablement requirement.

In re Wiggins, 488 F.2d 538, 179 USPQ 421 (CCPA 1973) and *In re Sheppard*, 339 F.2d 238, 144 USPQ 42 (CCPA 1964), do not support a contrary view. In those cases, *the references were deemed insufficient, because they stated that attempts to prepare the claimed compounds were unsuccessful. Such failures by those skilled in the art (having possession of the information disclosed by the publication) are strong evidence that the disclosure of the publication was nonenabling.* By contrast, the fact that the author of a publication did not attempt to make his disclosed invention does not indicate one way or the other whether the publication would have been enabling.

PO Sur-reply, 15-16

Masimo did not meet its burden of showing undue experimentation

Patent Owner's Response

Masimo developed innovative sensor designs that allow more accurate noninvasive measurement of multiple physiological parameters, such as oxygen saturation, carboxyhemoglobin, and more. EX2029, 98:9-102:1. Extracting the

POR, 5

saturation and pulse rate. *See, e.g.*, EX1001, cover, 3:23-58, 5:34-51, Claims. The claimed inventions result from research conducted by Ammar Al-Ali, Mohamed Diab, and their co-inventors on more accurately measuring multiple physiological parameters. EX2030, 122:1-129:3, 138:9-141:14. The claimed sensor designs include features to measure physiological parameters more accurately in difficult conditions, such as for determining additional parameters and at various measurement locations, including “a finger,” “a foot,” “an ear,” or “a forehead or other tissue surface.” *See, e.g.*, EX1001, 5:66-6:3, 6:42-55, 15:14-23, FIGS. 1, 32, 46, Claims.

POR, 6

55

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Masimo did not meet its burden of showing undue experimentation

PO Sur-reply

Moreover, Masimo showed Apple's measuring-four-analytes-with-four-wavelengths proposal is not as simple as solving four equations with four unknowns because of additional unknowns like differing path lengths. POR, 45. Apple relies on Secker to argue differing path lengths "does not apply" to transmittance sensors like Abdul-Hafiz+Raley. Reply, 15. But Secker addresses a separate issue—"depth of penetration" of light. EX1006, 3:28-45. Light's depth penetration is known in transmittance sensors because emitted light passes completely through the tissue before being detected. POR, 63-64; EX1004, FIG. 2; EX2079 ¶144. However, light's path length is an unknown in transmittance sensors because it readily changes for many reasons and thus cannot be assumed to "cancel out." POR, 45.

PO Sur-reply, 15-16

Masimo did not meet its burden of showing undue experimentation

Dr. Kenny

For transmittance sensors arranged in a fingertip probe such as those described in Raley and Abdul-Hafiz and the '911 patent, the emitters are located very close together, and thus the light paths are very close together and the path lengths are approximately the same for light emitted by each emitter, as explained in Webster:

APPLE-1011, 144-145, 104. Because the path lengths are approximately the same, the path lengths in the equations cancel out, and this “unknown variable”, which receives considerable attention from the Patent Owner and Dr. Madisetti, is well-accounted for. A POSITA would have understood from the prior art that it is not necessary to independently determine and correct for path length differences in a transmission pulse oximeter, such as described in the '911 patent, Abdul-Hafiz, Raley, and other references.

EX1079, ¶34; Petitioner's Reply, 15

57

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Abdul-Hafiz and Raley Combination Issues

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Table of Contents: Abdul-Hafiz+Raley Combination Issues

- **Issue 6:** A POSITA would have reasonably expected success in modifying Abdul-Hafiz to measure oxygen saturation and at least one of carboxyhemoglobin and methemoglobin.
- **Issue 7:** A POSITA would have been motivated to modify Abdul-Hafiz to measure more blood analytes.
- **Issue 8:** A POSITA would have been motivated to modify Abdul-Hafiz to compensate for errors in the measurement of oxygen saturation.

ISSUE 6

A POSITA would have reasonably expected success in modifying Abdul-Hafiz to measure oxygen saturation and at least one additional blood analyte

Actual success not required

Patent Owner Response

EX2079 ¶117. For example, a POSITA would not have reasonably expected success in the proposed modification of Abdul-Hafiz and Raley because **no one**, not even the company behind Raley and Jarman, **was able to develop a device** using four wavelengths of light to measure oxygen saturation, carboxyhemoglobin, and methemoglobin before the '911 Patent. *Supra* §VII.C.1; EX2079 ¶117.

POR, 47

Almirall, LLC v. Amneal Pharms. LLC, 28 F.4th 265, 275 (Fed. Cir. 2022)

We agree with Amneal. A finding of a reasonable expectation of success does not require absolute predictability of success. See [OSI Pharms., LLC v. Apotex Inc., 939 F.3d 1375, 1385 \(Fed. Cir. 2019\)](#). The Board's reasonable expectation of success

Pet. Reply, 16

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

ISSUE 7

A POSITA would have been motivated to modify Abdul-Hafiz to measure at least one additional blood analyte

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Motivation to measure at least one additional blood analyte

Raley

there is a desire to expand the use of photoplethysmography into the monitoring of additional blood analytes such as carboxyhemoglobin, methemoglobin and other dyshemoglobins. This proliferation of monitor types will add addi-

EX1005, 1:42-45; Petition, 15

Jarman

hemoglobin in blood. An accurate measurement of carboxyhemoglobin concentration in the patient's blood may be needed when the patient is a smoker or if carbon monoxide poisoning is suspected. Additionally, elevated methemoglobin levels in the blood can be caused by various medications, illegal drugs and certain pathological conditions such as sickle cell anemia. Therefore measurement of the methemoglobin concentration is also useful during patient evaluation.

EX1007, 1:19-36; Petition, 18

ISSUE 8

A POSITA would have been motivated to modify Abdul-Hafiz to compensate for errors in the measurement of oxygen saturation

Motivation to compensate for errors in oxygen saturation measurements

Jarman

hemoglobin and methemoglobin. In particular, if carboxyhemoglobin or methemoglobin is present in above normal levels, a conventional pulse oximeter will give falsely high readings for the arterial oxygen saturation. This is one of the most serious and potentially dangerous limitations of current pulse oximetry.

EX1007, 2:5-10; Petition, 18

Barthelemy

Furthermore, the oxymetries only gave measurements of Hb and HbO₂, ignoring a third form of hemoglobin, carboxyhemoglobin, which results from the fixation of carbon monoxide on hemoglobin, with a relatively high bonding energy.

For a long time, certainly, apart from cases of serious carbon monoxide poisoning, the error introduced by the presence of carboxyhemoglobin, or HbCO, in the measurement of oxygen saturation, was ignored. With the spreading battle against smoking and air pollution by automotive vehicles, however, the possibility of determining the HbCO content emerged as increasingly desirable.

The objective of the Applicants was to make an instrument capable of determining the respective shares of Hb, HbO₂ and HbCO in the arterial blood, which is

EX1008, 3:25-40; Petition, 18

The Board agreed that a POSITA would have been motivated to modify Abdul-Hafiz to compensate for errors in oxygen saturation measurements

Institution Decision

5:65–6:2. Given the need in the art to compensate for errors in oxygen saturation measurements resulting from carboxyhemoglobin and methemoglobin and Raley's express teaching of a probe that measures blood analytes such as carboxyhemoglobin and methemoglobin, we are persuaded, at this stage of the proceeding, that a POSITA would have been motivated to combine the teachings of Abdul-Hafiz's pulse oximetry system and Raley's probe to compensate for errors in the measurement of oxygen saturation due to the presence of carboxyhemoglobin and methemoglobin.

Institution Decision, 34

Motivation to compensate for errors is not a generic motivation

Patent Owner Response

“compensation” reveals its hindsight-based analysis. EX2079 ¶130. Apple’s generic “improve-the-accuracy” motivation is merely a theoretical benefit or possibility of achieving a beneficial result, which fails to show that a POSITA would have been motivated to make the specific combination that Apple relies upon. *Id.*; *see, e.g., ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312,

POR, 54

Petitioner’s Reply

methemoglobin. Pet., 15, 18-19; ID, 34. Apple’s motivation is not merely to “build something better.” POR, 54-55; APPLE-1079, ¶40. Rather, Dr. Kenny articulated a specific motivation (to improve oxygen saturation accuracy) and explains a number of circumstances that would inspire the motivation, based on evidence of record (Jarman, Barthelemy, and other prior art), to support his conclusion of obviousness. APPLE-1003, ¶¶67-68; Pet. 18-20, 25-27; POR, 55-56; EX2046, 2; EX2047, 1; EX2057, 5.

Pet. Reply, 21-22

Masimo's LNOP sensor not representative of Abdul-Hafiz

Patent Owner Response

oxygen saturation measurements. Pet. 18-20. But that is incorrect. Abdul-Hafiz covers the Masimo LNOP sensor, as explained above. *Supra* §III. And the accuracy of the Abdul-Hafiz design (i.e., Masimo's LNOP sensors) was known among POSITAs and highly regarded in the industry. *See, e.g.*, EX2061, 3 ("Over 40

oximetry system suffering from inaccuracy. EX2080, 154:13-155:4. Given the widely acclaimed accuracy of Abdul-Hafiz's sensor design, a POSITA would not have been motivated to modify Abdul-Hafiz based on Raley to somehow improve Abdul-Hafiz's measurement accuracy. EX2079 ¶129.

POR, 54

Dr. Kenny

and are not relevant to this topic. Additionally, the LNOP sensor is not a limiting embodiment or even representative of Abdul-Hafiz because there are differences between the LNOP sensor and Abdul-Hafiz. For example, a visual comparison of the picture of the LNOP sensor with Abdul-Hafiz FIG. 11B shows that the EMI shield grids and the optical housings are different. Further, Abdul-Hafiz does not describe any "advanced signal processing" comparable to that included in the Masimo LNOP sensors. EX2038, 1-2. The differences between the LNOP sensor and Abdul-Hafiz establish that they are not identical, and the LNOP sensor at least embodies a different species of Abdul-Hafiz. Therefore, the accuracy of Masimo LNOP sensors does not necessarily follow from Abdul-Hafiz's disclosures and does not necessarily reflect the accuracy of Abdul-Hafiz's measurement.

EX1079, ¶38; Pet. Reply, 20

DateX-Ohmeda's oximeter not representative of Raley

Patent Owner Response

Fourth, Apple's proposed modification is based on Raley—a DateX-Ohmeda reference. Pet. 14-31; EX1005. But a POSITA would have recognized that DateX-Ohmeda's pulse oximeters were calibrated to be "more insensitive to changes of carboxyhemoglobin and methemoglobin concentrations in blood" than other sensors at the time. EX2063, 9; EX2079 ¶131. Because devices like Raley were already "more insensitive" to carboxyhemoglobin and methemoglobin, a POSITA would not have been motivated to modify Abdul-Hafiz based on Raley to "compensate for errors in the measurement of oxygen saturation due to [these analytes]." Pet. 14-31.

POR, 55

Dr. Kenny

Additionally, the DateX-Ohmeda's pulse oximeter is not a limiting embodiment or even representative of Raley because there are differences between DateX-Ohmeda's pulse oximeters and Raley's disclosure. A comparison of DateX-Ohmeda S/5 M-Modules Technical Reference Manual with Raley's disclosure shows that the Manual provides many details that are absent in Raley and vice versa. For example, the Manual describes a sensor with two emitters:

EX2063, 22². In contrast, Raley discloses a device with four emitters:

APPLE-1005, 5:63-6:2. The differences between the Manual and Raley establish that they are not identical, and the pulse oximeter described in the Manual at least embodies a different species of Raley. Therefore, the sensitivity of the pulse oximeter described in the Manual does not necessarily follow from Raley's disclosure and does not necessarily reflect the sensitivity of Raley's measurements.

EX1079, ¶41; Pet. Reply, 22

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Abdul-Hafiz, Raley, and Secker Combination Issues

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Claim Language

8 LEDs

2. The device of claim 1, wherein the at least three LEDs comprises at least eight LEDs.

EX1001, 19:58-59

11. The device of claim 10, wherein the at least three LEDs comprises at least eight LEDs.

EX1001, 20:30-31

23. The method of claim 19, wherein the at least three LEDs comprises at least eight LEDs.

EX1001, 21:11-12

12 LEDs

4. The device of claim 1, wherein the at least three LEDs comprises at least twelve LEDs.

EX1001, 19:62-63

13. The device of claim 10, wherein the at least three LEDs comprises at least twelve LEDs.

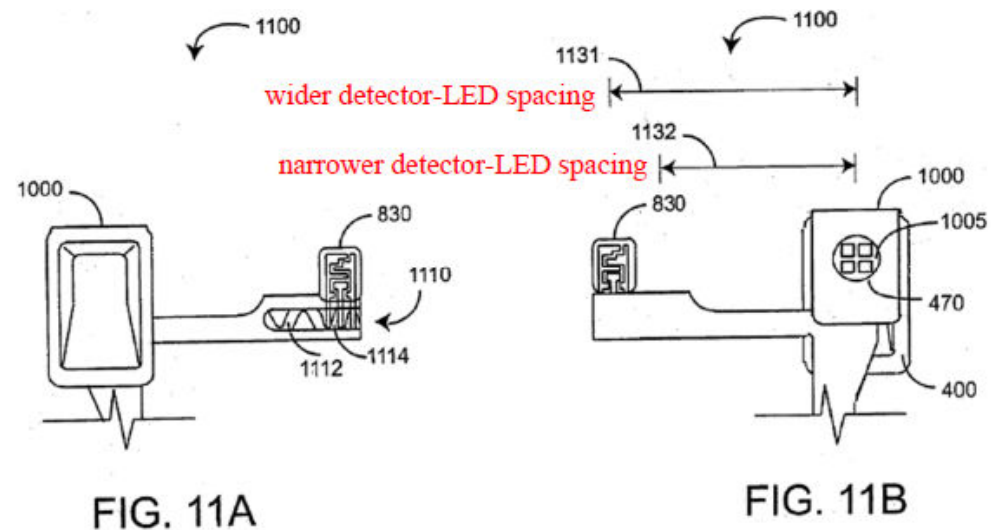
EX1001, 20:35-36

25. The method of claim 19, wherein the at least three LEDs comprises at least twelve LEDs.

EX1001, 21:15-16

Overview of Abdul-Hafiz

nected to a pad 1110. As shown in FIG. 11A, a particular embodiment of the pad 1110 advantageously has an inner contact set 1112 and an outer contact set 1114. The emitter 830 may be attached and electrically connected in a first position to the inner contact set 1112 or in a second position to the outer contact set 1114. As shown in FIG. 11B, this advantageously provides two different detector-emitter spacings 1131, 1132 on the same flexible circuit substrate. A comparatively wider spacing 1131 corresponds to the second emitter position attached to the outer contact set 1114 (shown), and a comparatively narrower spacing 1132 corresponds to the first emitter position attached to the inner contact set 1112 (not shown). The choice of mounting the emitter with a narrower or wider spacing accommodates different sensor types for different sized patients or different tissue site thicknesses with fewer unique sensor parts or



EX1004, [0047]; Petition, 78

EX1004, FIGS. 11A, 11B; Petition, 78

Overview of Abdul-Hafiz

nected to a pad 1160 having extended contacts. The contacts are extended along the direction between the detector assembly 1000 and the emitter 830, allowing the emitter to be mounted on the same pad 1160 in multiple positions. As shown in FIG. 11C, the emitter 830 is installed over an elongated aperture 1170. The extended pad area 1160 advantageously provides for different detector-emitter spacings 1181, 1182 (FIGS. 11D-E) on the same flexible circuit substrate. A comparatively narrower spacing 1181 corresponds to a first emitter position (FIG. 11D), and a comparatively wider spacing 1182 corresponds to a second emitter position (FIG. 11E). This accommodates different sensor types for different sized patients or different tissue site thicknesses with fewer unique sensor parts or subas-

EX1004, [0049]; Petition, 79

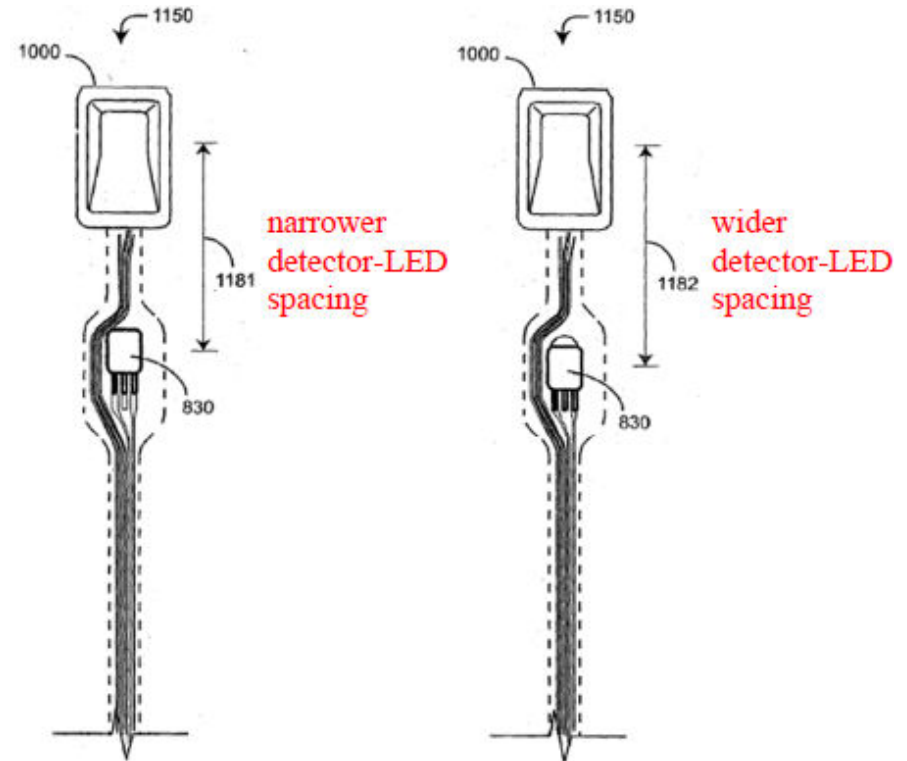


FIG. 11D

FIG. 11E

EX1004, FIGS. 11D, 11E; Petition, 79

Overview of Secker

instead. A further possibility is to provide a multiplicity of transmitter LEDs of one wavelength and a further multiplicity of transmitter LEDs of a second wavelength.

Such a sensor is depicted in FIG. 8. Carrier body 69 comprises red LEDs 70a to 70d and 71a to 71d as well as infrared LEDs 72a to 72d and 73a to 73d. The photo-electric receiver is outlined as 74. Such a sensor may be used, in conjunction with an appropriate oximeter, for very precise manual or automatic adaptation to different kinds of measurement by selecting an appropriate red LED/infrared LED combination.

EX1006, 15:35-46; Petition, 75

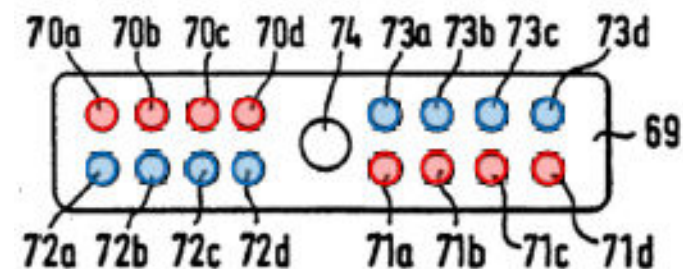


FIG. 8

EX1006, FIG. 8; Petition, 76

Abdul-Hafiz+Raley+Secker Combination

Abdul-Hafiz

[0050] The ability to adjust the detector-emitter spacing on a particular flexible circuit so as to minimize the number of unique parts in manufacturing various sensor types and sizes is disclosed above. That disclosure is with respect to a pad 1110 (FIG. 11A) having multiple contact sets and a pad 1160 (FIG. 11C) having extended contacts with an associated elongated aperture 1170 (FIG. 11C). One of ordinary skill in the art will recognize other electrical and mechanical structures that allow such detector-emitter spacing adjustment.

EX1004, [0050]; Petition, 82; Pet. Reply, 25

Webster

In transmission probes, as the photodiode has to detect the light transmitted through the tissue, the detector is placed in line with the LEDs so that the maximum amount of the transmitted light is detected. The photodiode should be

EX1011, 104; Pet. Reply, 24

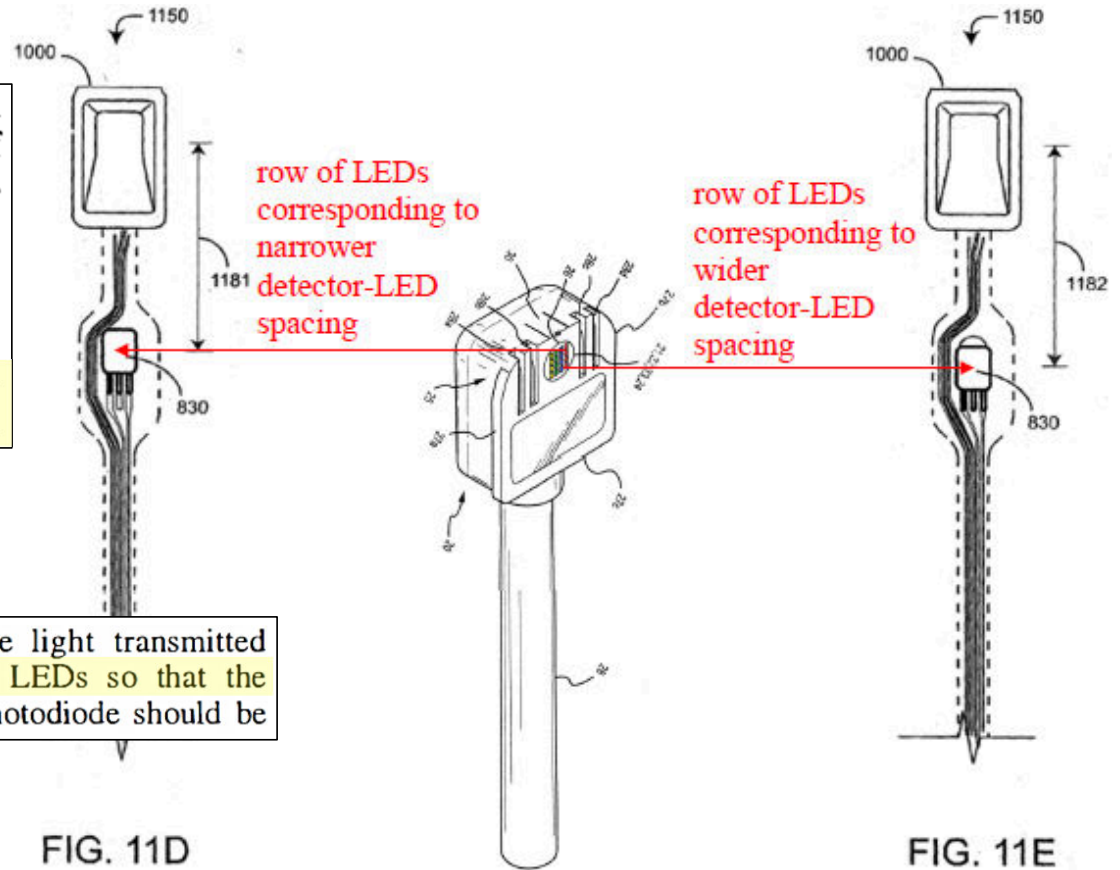


FIG. 11D

FIG. 11E

Abdul-Hafiz+Raley+Secker's
emitter assembly

EX1004, FIGS. 11D, 11E; EX1005, FIG. 3; Petition, 84

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Abdul-Hafiz+Raley+Secker Combination

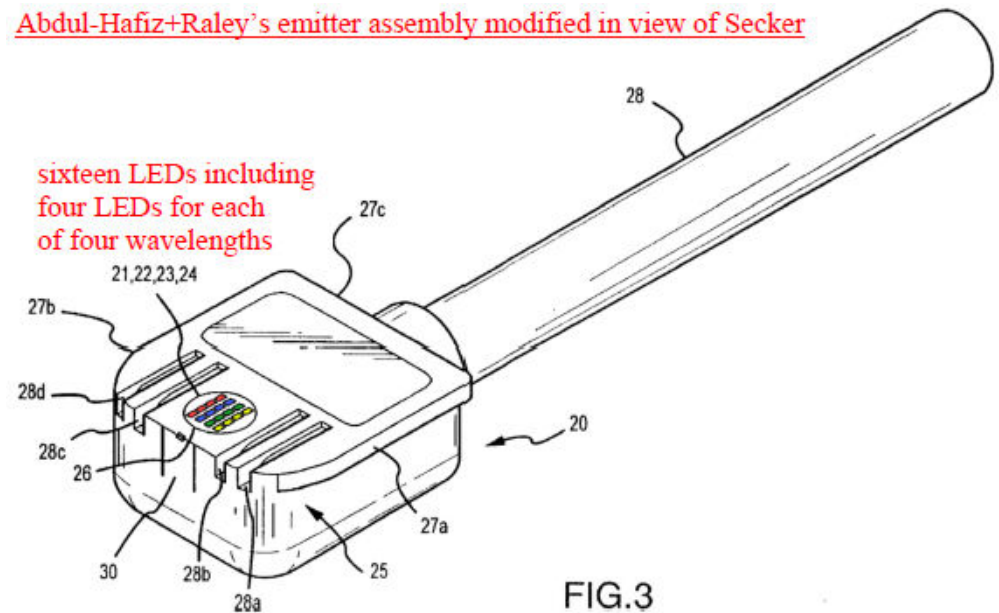
A POSITA seeking to implement the Abdul-Hafiz+Raley pulse oximetry system would have been motivated to integrate Secker's teachings regarding multiple selectable LEDs for each wavelength into the Abdul-Hafiz+Raley sensor to arrive at a predictable configuration of a sensor with multiple selectable LEDs for each of the four wavelengths used for determining an estimate of three or four blood analyte levels to achieve the benefits described by Secker above. APPLE-1004, [0047], [0049]-[0050], FIG. 11A-E; APPLE-1006, 6:4-20, 6:38-7:40, 8:67-68, 14:52-15:29, 15:35-46; APPLE-1003, ¶161.

Petition, 81-82

1214, 1219 (Fed. Cir. 2016). Here, a POSITA recognizing that Raley provides LEDs of four wavelengths and Secker provides four LEDs for each wavelength would have found it obvious to provide four LEDs for each of the four wavelengths, resulting in sixteen LEDs. APPLE-1079, ¶42.

Pet. Reply, 23

Abdul-Hafiz+Raley's emitter assembly modified in view of Secker



EX1005, FIG. 3 (modified in view of Secker's teachings); Petition, 83

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

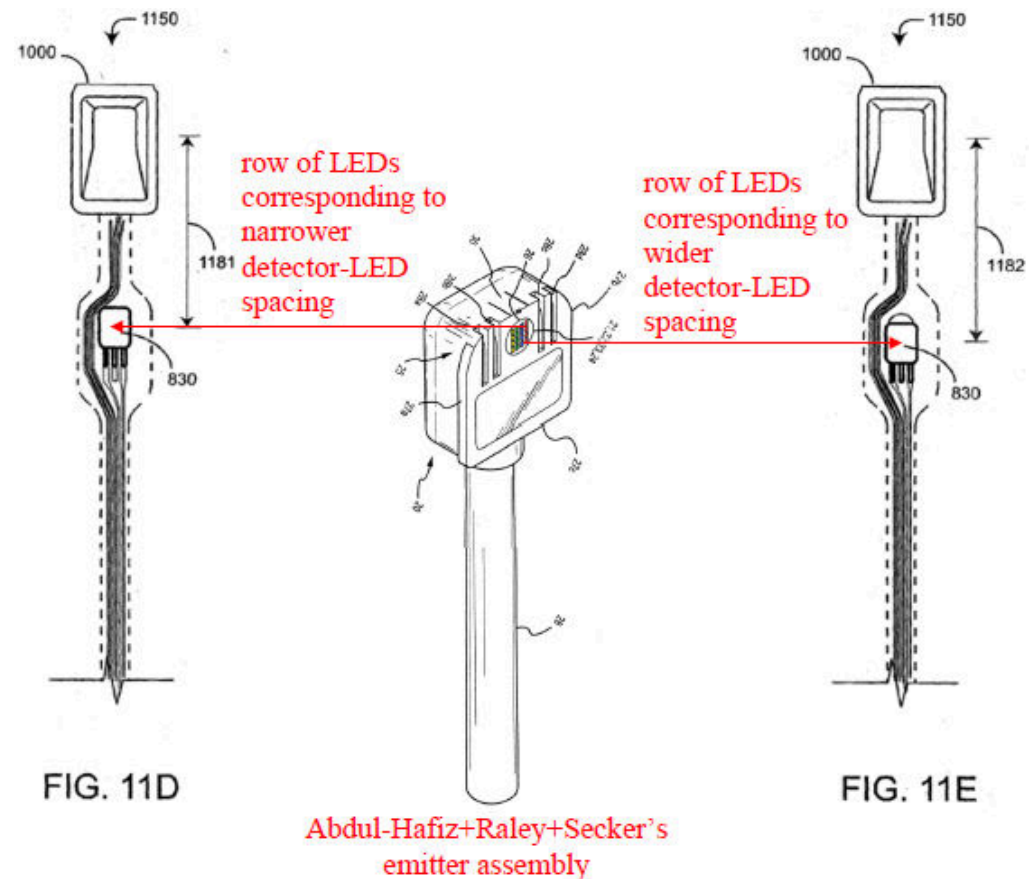
Abdul-Hafiz+Raley+Secker Combination

Such a sensor estimates the three or four blood analyte levels using automatically selected LEDs with appropriate detector-LED spacings that accommodate different sized patients or different tissue site thicknesses. APPLE-1004, [0047], [0049]-[0050], FIG. 11A-E; APPLE-1006, 6:4-20, 6:38-7:40, 8:67-68, 14:52-15:29, 15:35-46. A POSITA would have been motivated to integrate Secker's teachings into the Abdul-Hafiz+Raley sensor to achieve these benefits. APPLE-1003, ¶165.

Petition, 84-85

Pet., 78-79; APPLE-1079, ¶45. A POSITA would have recognized that these variations in finger tissue and thicknesses exist even in transmittance applications and would have been motivated to provide a sensor that accommodates different sized patients or tissue thicknesses. This would obviate the need for the physician or clinician to select the appropriately sized sensor for the patient's finger. Masimo does not dispute that it would be beneficial to provide a single sensor that accommodates different sized patients or tissue thicknesses.

Pet. Reply, 26



EX1004, FIGS. 11D, 11E; EX1005, FIG. 3; Petition, 84

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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

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KSR Int'l Co. v. Teleflex Inc., **550 U.S. 398, 418, 421 (2007)**

conclusion of obviousness"). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. Regardless of Asano's primary purpose, the design provided an obvious example of an adjustable pedal with a fixed pivot point; and the prior art was replete with patents indicating that a fixed pivot point was an ideal mount for a sensor. The idea that a designer hoping to make an adjustable electronic pedal would ignore Asano because Asano was designed to solve the constant [*421] ratio problem makes little sense. A person of ordinary skill is also a person of ordinary creativity, not an automaton.

Petition, 80; Pet. Reply, 24, 26

ClassCo, Inc. v. Apple, Inc., **838 F.3d 1214, 1219 (Fed. Cir. 2016)**

Contrary to ClassCo's argument, KSR does not require that a combination only unite old elements without changing their respective functions. KSR, 550 U.S. at 416, 127 S.Ct. 1727. Instead, KSR teaches that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *Id.* at 421, 127 S.Ct. 1727. And it explains that the ordinary artisan recognizes "that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420, 127 S.Ct. 1727. The rationale of KSR does not support ClassCo's theory that a person of ordinary skill can only perform combinations of a puzzle element A with a perfectly fitting puzzle element B. To the contrary, KSR instructs that the obviousness inquiry requires a flexible approach. *Id.* at 415, 127 S.Ct. 1727. Here, the Board faithfully applied this flexible approach to find that the combination of Fujioka and Gulick "would have resulted in no more than [a] predictable result." J.A. 6.

Pet. Reply, 23

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Patent Owner's Sur-reply

and showed they lack these features. POR, 61-62. Secker describes pulse oximeters with numerous LEDs but only two wavelengths; Abdul-Hafiz describes pulse oximeters with only two LEDs and two wavelengths; and Raley has four wavelengths but only four LEDs. *Id.* Thus, none of Apple's references have at least eight/twelve LEDs comprising at least three wavelengths (*id.*), which Apple does

PO Sur-reply, 22

Merck & Co. v. Biocraft Labs., Inc., **874 F.2d 804, 807-08 (Fed. Cir. 1989)**

mere absence from the prior art of a teaching or a limitation recited in the patent at issue is insufficient for a conclusion of nonobviousness. Unlike a section 102 defense which requires that a single reference describe each and every element of a claimed invention, *Structural Rubber Products Co. v. Park Rubber Co.*, 749 F.2d 707, 715, 223 USPQ 1264, 1270 (Fed.Cir.1984), "the question under 35 USC 103 is not merely what the references expressly teach but what they would have suggested to one of ordinary skill in the art at the time the invention was made." *In re Lamberti*, 545 F.2d at 750, 192 USPQ at *808 280. That this distinction was missed is evident from the district court's erroneous

Game & Tech. Co. v. Wargaming Grp. Ltd., **942 F.3d 1343, 1352 (Fed. Cir. 2019)**

not the D&D Handbook. The question in an obviousness inquiry is whether it would have been obvious to a person of ordinary skill in the art to combine the relevant disclosures of the two references, not whether each individual reference discloses all of the necessary elements. See *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1364 (Fed. Cir. 2008) ("Obviousness can be proven by combining existing prior art references, while anticipation requires all elements of a claim to be disclosed within a single reference."). GAT's argument therefore misses its mark.

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Patent Owner Response

Secker describes a particular approach of using more LEDs to solve a problem that was limited to reflectance sensors. But Apple relies on Secker's approach to propose adding LEDs to the Abdul-Hafiz+Raley sensor—a different type of sensor known as a transmittance sensor. Accordingly, Secker's approach would not have motivated a POSITA to add more LEDs to the Abdul-Hafiz+Raley sensor. EX2079 ¶143.

POR, 63

Petitioner's Reply

a POSITA would have recognized that Secker's teachings allow detector-emitter spacing adjustment. APPLE-1079, ¶44. Indeed, Masimo admits that Secker describes techniques for adding and selecting LEDs to achieve the optimal light path. POR, 64-67; EX2079, ¶145.

Pet. Reply, 25

In re Applied Materials, Inc., 692 F.3d 1289, 1298 (Fed. Cir. 2012)

Applied argues that the triangular cross-section of the grooves in Breivogel renders that reference inadequate. One of ordinary skill in the art is not foreclosed from combining the Breivogel dimensions with the Weling cross-sectional shape merely because Breivogel discloses triangular grooves. A reference must be considered for everything that it teaches, not simply the described invention or a preferred embodiment. See *EWB Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985); *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976). Even though Breivogel describes grooves with a particular cross-sectional shape, this does not preclude one of ordinary skill in the art from utilizing Breivogel's other teachings on the width, depth, and pitch in combination with other features of the Weling pad. One of ordinary skill in the art is not an "automaton." *KSR*, 550 U.S. at 421, 127 S.Ct. 1727. For the same reasons, Talieh's teachings on the dimensions can be combined with the Weling pad, despite the fact that Talieh teaches grooves with a centered spiral or offset circular arrangement.

Pet. Reply, 24

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