

Patent Owner Masimo's Trial Hearing Demonstratives

Apple Inc. v. Masimo Corp.

IPR2024-00241, -243, -244

U.S. Pat. Nos. 10,687,743 & 10,722,159

REDACTED PUBLIC VERSION

Notes and Abbreviations

Notes

- ⦿ Emphases, highlighting, and annotations added unless noted otherwise.
- ⦿ Arguments/exhibits common to multiple IPRs are cited with respect to one proceeding
- ⦿ Specific arguments/exhibits cited with IPR number prefix, e.g.:
 - 241-POR refers to IPR2024-00241 Patent Owner Response
 - 243-EX1001 refers to IPR2024-00243 Exhibit 1001

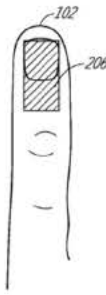
Abbreviations

Pet.	=	Petition
POPR	=	Patent Owner's preliminary Response
Inst.	=	Institution Decision
POR	=	Patent Owner's Response
Reply	=	Petitioner's Reply
Sur-Reply	=	Patent Owner's Sur-Reply
SpO₂	=	Oxygen saturation measured by pulse oximetry

Background

'743 & '159 Patents

United States Patent		(10) Patent No.: US 10,687,743 B1
Al-Ali		(45) Date of Patent: *Jun. 23, 2020
<p>(54) PHYSIOLOGICAL MEASUREMENT DEVICES, SYSTEMS, AND METHODS</p> <p>(71) Applicant: MASIMO CORPORATION, Irvine, CA (US)</p> <p>(72) Inventor: Ammar Al-Ali, San Juan Capistrano, CA (US)</p> <p>(73) Assignee: Masimo Corporation, Irvine, CA (US)</p> <p>(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.</p> <p>This patent is subject to a terminal disclaimer.</p> <p>(21) Appl. No.: 16/791,955</p> <p>(22) Filed: Feb. 14, 2020</p> <p>Related U.S. Application Data</p> <p>(63) Continuation of application No. 16/532,061, filed on Aug. 5, 2019, which is a continuation of application (Continued)</p> <p>(51) Int. Cl. A61B 5/1455 (2006:01) A61B 5/145 (2006:01) (Continued)</p> <p>(52) U.S. Cl. CPC — A61B 5/14552 (2013:01); A61B 5/0062 (2013:01); A61B 5/02416 (2013:01); (Continued)</p> <p>(58) Field of Classification Search None See application file for complete search history.</p> <p>(56) References Cited U.S. PATENT DOCUMENTS 4,960,128 A 10/1990 Gordon et al. 4,964,408 A 10/1990 Hsieh et al. (Continued)</p> <p>FOREIGN PATENT DOCUMENTS CN 101484065 B 7/2009 CN 101564290 B 10/2009 (Continued)</p> <p>OTHER PUBLICATIONS US 8,845,543 B2, 09/2014, Duh et al. (withdrawn) (Continued)</p> <p>ABSTRACT A non-invasive, optical-based physiological monitoring system is disclosed. One embodiment includes an emitter configured to emit light. A diffuser is configured to receive and spread the emitted light, and to emit the spread light at a tissue measurement site. The system further includes a concentrator configured to receive the spread light after it has been attenuated by or reflected from the tissue measurement site. The concentrator is also configured to collect and concentrate the received light and to emit the concentrated light to a detector. The detector is configured to detect the concentrated light and to transmit a signal representative of the detected light. A processor is configured to receive the transmitted signal and to determine a physiological parameter, such as, for example, arterial oxygen saturation, in the tissue measurement site.</p> <p>25 Claims, 7 Drawing Sheets</p>		



- ⦿ Result of Ammar Al-Ali's research on pulse oximetry at the wrist around 2014-2015
- ⦿ Unconventional 3D model
- ⦿ Novel combination of features
 - Change in shape
 - Reduce "light piping"
- ⦿ Oxygen saturation at the wrist:
 - '743 Patent Claim 18; and
 - '159 Patent Claims 8 and 17

Masimo's Wrist-Worn Sensor Uses Patented Technology



241-POR at 5-6; 243-POR at 5-6

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

5

244 IPR

244 IPR Grounds

244 IPR ('159 Patent)		
Ground	Claims	References
Sarantos Grounds 1A, 1C, 1D, 1G	1A	1-5, 7-9, 12-13
	1C	2
	1D	3
	1G	14, 16-25
Sarantos+Shie Grounds 1B, 1E, 1F, 1H	1B	1-5, 7-14, 16-18
	1E	2
	1F	3
	1H	14, 16-25

*Apple relies on Brady, Han, Utter for elements not in dispute

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

244 IPR Sarantos Grounds Changing Light Shape (Claims 1-13 and 19-25)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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Changing Light Shape (Claims 1 and 19)

Independent Claim 1 (and dependent Claims 2-13)

1. A physiological monitoring device comprising:
... a material positioned between the plurality of emitters and a tissue measurement site on a wrist of a user when the physiological monitoring device is in use, **the material configured to change the first shape into a second shape** by which the light emitted from one or more of the plurality of emitters is projected towards a surface of the tissue measurement site ...

Independent Claim 19 (and dependent Claims 20-25)

19. A system configured to measure one or more physiological parameters of a user, the system comprising:
... a material positioned between the plurality of emitters and a tissue measurement site when the physiological monitoring device is in use, **the material configured to change the first shape into a second shape** by which the light emitted from one or more of the plurality of emitters is projected towards the tissue measurement site ...

Sarantos Does Not Render Obvious Changing First Shape of Light to Second Shape

Petition:

“A POSITA would have found it obvious that light shining through translucent or transparent material would change in shape due to the refractive properties of translucent and transparent materials.”

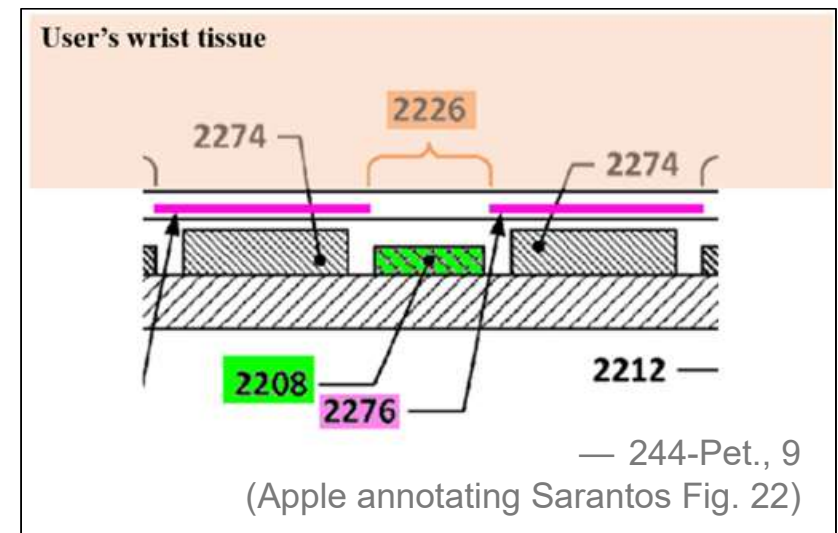
— 244-Pet., 9-10

Institution Decision:

- ⊙ “[W]e view Petitioner’s position as based on its argument that a POSITA, when interpreting Sarantos, would understand that its translucent or transparent window material would **necessarily** change the shape of light.”

— 244-Inst., 9

- ⊙ “**Necessarily** change” → inherency



Sarantos Does Not Disclose Changing the Shape of Light

Apple's counsel at IPR2022-01291 oral argument:

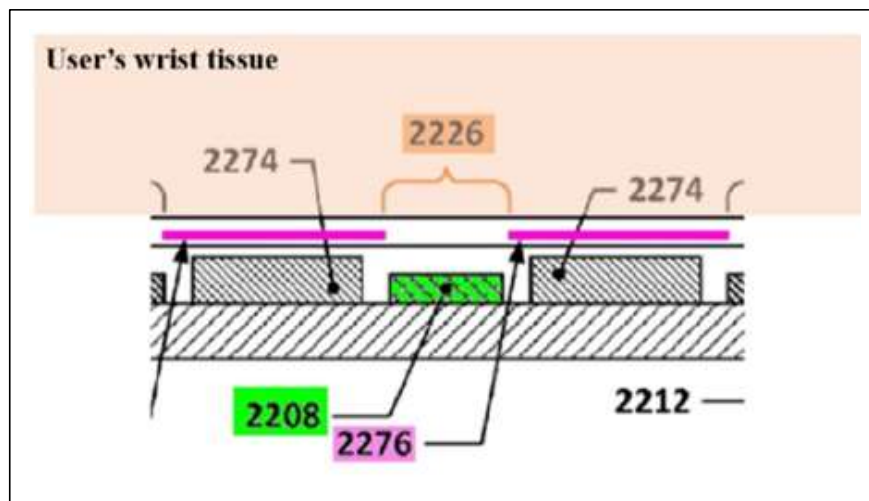
14 projected towards the tissue. So, on slide 50, we see that Sarantos describes
15 a translucent or transparent material in the region 2226 between the light
16 source 2208, which is highlighted in green, in the Figure 22 on the right, and
17 the tissue, which is above the region 2226. But Sarantos doesn't describe the
18 material as configured to change the first shape of light entering the material
19 from the light source 2208 to a different second shape of light exiting the
20 material towards the tissue. And so, turning to slide 51, we see that Shie
21 describes such material. Specifically, Shie describes various optical

— EX2099, 18:14-21

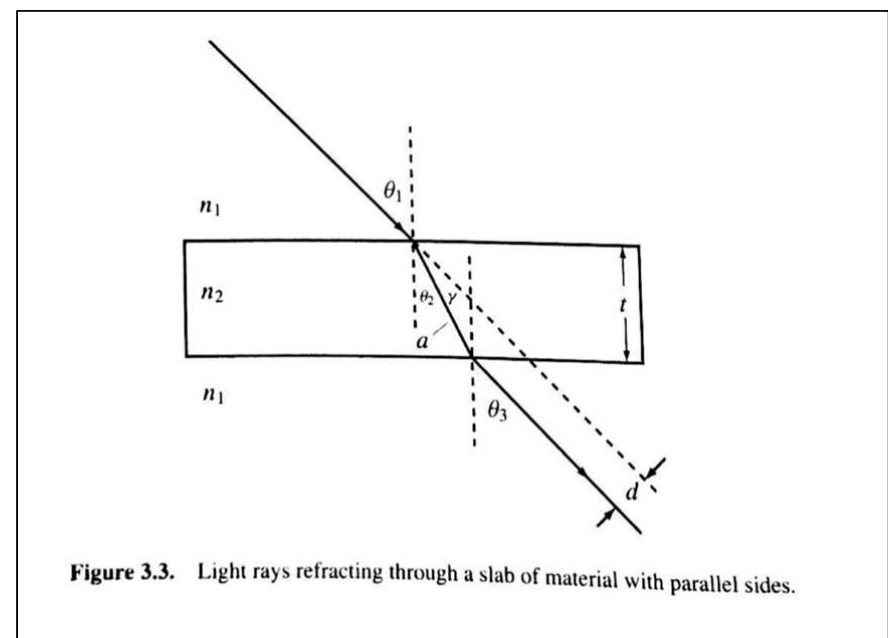
Light Shape Change Is Not Inherent

Undisputed

Refraction through flat window does not change the shape of light



— 244-Pet., 9



— EX2097, 62-63

Light Shape Change Is Not Inherent

Undisputed

Prosecution history of parent application confirms not all refractive materials change the shape of light:

Dear Commissioner:

A telephonic interview was conducted and attended by Examiner Fardanesh and Applicant's representative Jarom D. Kesler (Reg. No. 57,046) on February 13, 2020. Agreement was reached that Applicant's proposed claim amendments, which reflect a change in shape of emitted light beyond a change in size, defined over the Examiner's citation of judicial notice of emitted light passing through a lens. Applicant thanks Examiner Fardanesh for her time and consideration.

— EX2056 at 162

Apple Should Also Be Judicially Estopped

**ONLY
DISPUTE**

Later position “clearly inconsistent” with earlier position

**NO
DISPUTE**

Whether party “succeeded in persuading a court to accept that party’s earlier position” creating perception that first or second court was misled

**NO
DISPUTE**

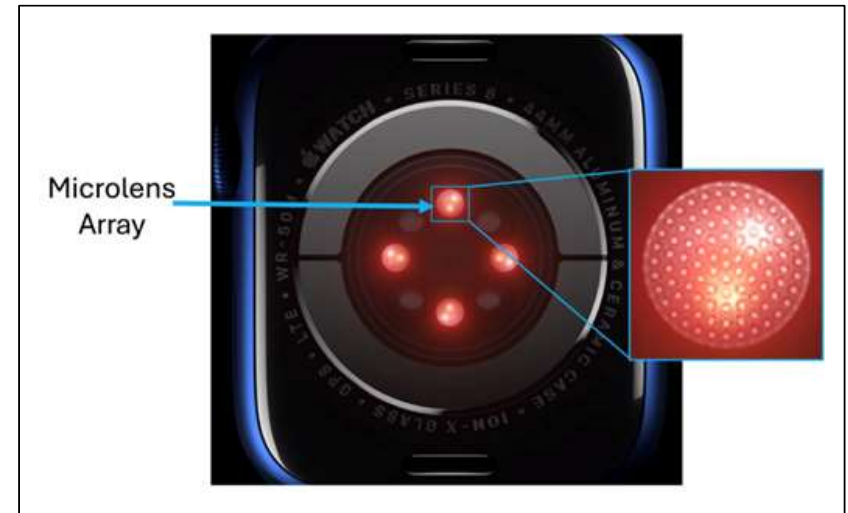
Whether party would obtain an unfair advantage or impose unfair detriment on opposing party

New Hampshire v. Maine, 532 U.S. 742, 750-751 (2001)

Apple Took Clearly Inconsistent Positions

Apple in the ITC Investigation:

- ⊙ Microlens Array (or “MLA”)—a translucent/transparent material in Apple Watch Series 6—does **not change the shape** of light.



Apple in this IPR:

- ⊙ “light shining through translucent or transparent material **would change in shape** due to the refractive properties of translucent and transparent materials”

Apple Clearly Took Inconsistent Positions

Apple's IPR expert:

A I recall, Mr. Kiang, that you had asked me a question whether it's changing the light.
And I said, yes.

* * *

Q What were you referring to by "it"?

A I believe you had asked about the image that you have on the screen.

Q That's the image of the Apple Watch; correct?

A Correct.

— EX2107, 97:21-99:3

Apple's Reply: New In-Mold Label Theory



Apple's Petition

The window may be made from translucent or transparent material.

APPLE-1005, 17:4-6. A POSITA would have found it obvious that light shining through translucent or transparent material would change in shape **due to the refractive properties of translucent and transparent materials.** APPLE-1003, ¶35.



Apple's Reply:

Sarantos provides, or at least renders obvious, a second, different shape shape defined by the **refractive properties of the window** **and due to the shape defined by the in-mold label.** Pet., 9-10; APPLE-1003, ¶¶34-35. Put simply, the

New argument
on reply

New In-Mold Label Theory Ignores the Claim Language

Independent Claim 1 (and dependent Claims 2-13)

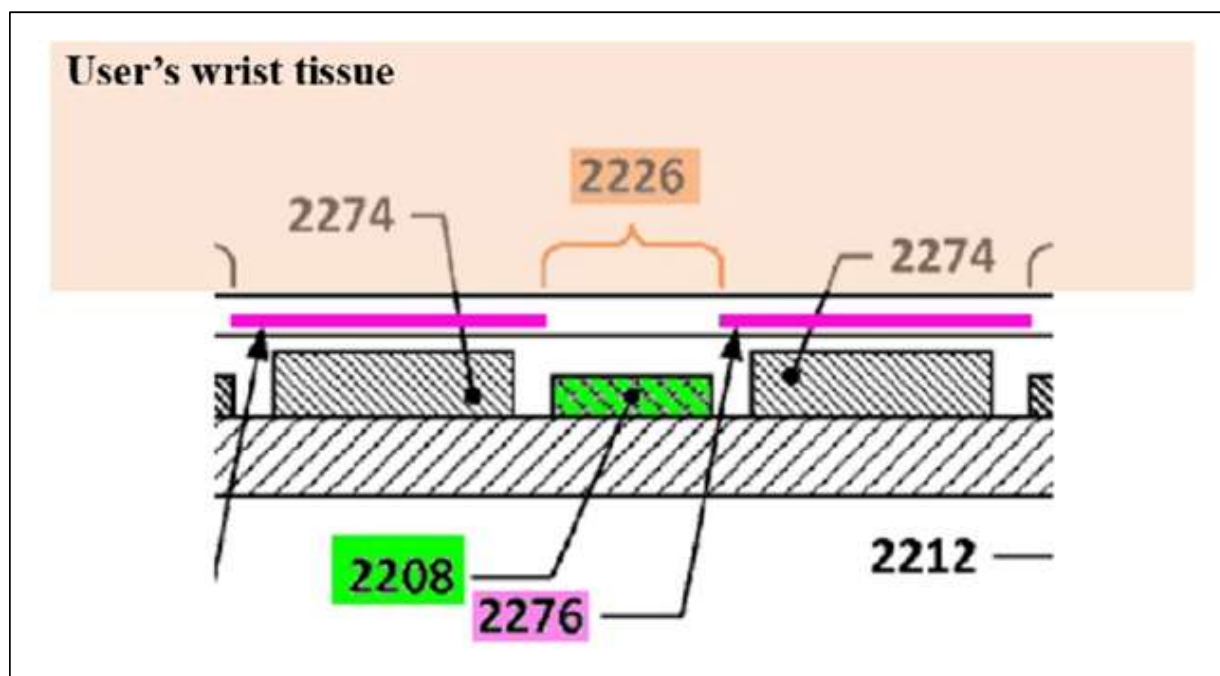
1. A physiological monitoring device comprising:
... a material positioned between the plurality of emitters and a tissue measurement site on a wrist of a user when the physiological monitoring device is in use, the material configured to change the first shape into a second shape by which the light emitted from one or more of the plurality of emitters is projected towards a surface of the tissue measurement site . . .

Independent Claim 19 (and dependent Claims 20-25)

19. A system configured to measure one or more physiological parameters of a user, the system comprising:
... a material positioned between the plurality of emitters and a tissue measurement site when the physiological monitoring device is in use, the material configured to change the first shape into a second shape by which the light emitted from one or more of the plurality of emitters is projected towards the tissue measurement site . . .

New In-Mold Label Theory Ignores the Claim Language

In-mold label (2276) is not “positioned **between** the plurality of emitters and a tissue measurement site.”



New In-Mold Label Theory Is Inconsistent with Petition

Apple's Petition identified window 2226—not the in-mold label—as the “material” that changes the shape of light

[9.0]

Sarantos teaches that its window (the claimed material, *supra* [1.2]) may be formed from “acrylic,” which a POSITA would have known is a type of plastic.

— 244-Pet., 28

Necessary to support Apple's argument on Claim 9:

Claim 9

[9.0]

The physiological monitoring device of claim 1, wherein the material comprises plastic.

Undisputed: Apple's Expert Testimony Is Inconsistent

Anthony's Opening Declaration

"square light-emitting devices" emit "**square shaped light beam**"

— EX1003, ¶¶110, 111, 115

Anthony's Reply Declaration

"two square light-emitting devices positioned side by side" create "**elongated, oblong shape**"

— EX1079, ¶61

Anthony's Cross-Examination

"the shape of it is **unknown**"

— EX2107, 110:19-111:14

Sarrafzadeh (Apple's ITC/Delaware Expert)

"even an object with a square-surface—such as the LEDs in the Accused Products—will emit light in a cone-shaped pattern" and "[w]hen viewing this conical emission profile from the top-down, the emitted light will appear **circular**."

— EX2098, ¶47

244 IPR Sarantos Grounds
Diffuser
(Claim 14-18)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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Relevant Element (Claim 14)

Independent Claim 14 (and dependent Claims 15-18)

1. A physiological monitoring device comprising:

...

a diffuser configured to be positioned between the plurality of optical sources and a tissue measurement site on the wrist of the user when the physiological monitoring device is in use;

...

Claim 14: Undisputed Sarantos Does Not Disclose a Diffuser

Apple's Petition in IPR2020-01722:

Neither Sarantos nor Mendelson-1991 disclose a diffuser.

— EX2105, 63

Apple's Reply: **No dispute**

Utter:

- ⦿ Apple did not rely on Utter for this claim element [14.2]
- ⦿ Apple relied on Utter for element [14.7] – transmission to a separate processor

-244 IPR Sarantos Grounds
Length/Width Of Second Shape
(Claim 24)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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Claim 24 Is Different Than Claim 12

Apple's Reply:

While the recitations of claim 24 are not identical to claim 12, the teachings of the prior art discussed in the Petition with respect to claim 12 are equally applicable to claim 24

— 244-Reply, 31

Claim 12	
[12.0]	The physiological monitoring device of claim 1, wherein the opening defined in the dark-colored coating comprises a width and a length, and wherein the width is larger than the length.

Claim 24	
[24.0]	The system of claim 19, wherein the second shape comprises a width and a length, and wherein the width is different from the length.

— 244-Pet., ix, xii

-244 IPR Sarantos-Shie Grounds
Collateral Estoppel
(all claims)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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244 IPR Grounds

244 IPR ('159 Patent)		
Ground	Claims	References
Sarantos Grounds 1A, 1C, 1D, 1G	1A	1-5, 7-9, 12-13
	1C	2
	1D	3
	1G	14, 16-25
Sarantos+Shie Grounds 1B, 1E, 1F, 1H	1B	1-5, 7-14, 16-18
	1E	2
	1F	3
	1H	14, 16-25

*Apple relies on Brady, Han, Utter for elements not in dispute

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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IPR2022-01465 Final Written Decision

Upon review of the foregoing, we conclude Apple's case for obviousness fails to provide a persuasive motivation for combining Sarantos and Shie to practice the invention of claim 13, for reasons provided below. These deficiencies apply even if one or more of Shie's lens structures is in fact "configured to *change the first shape [of light] into a second shape*," as claimed. Ex. 1001, 15:33–41 (emphasis added). Therefore, we need not

— IPR2022-01465 FWD (EX2036), 142

Apple **did not** appeal

Collateral Estoppel Elements

**ONLY
DISPUTE**

“the issue is identical to one decided in the first action”

**NO
DISPUTE**

“the issue was actually litigated in the first action”

**NO
DISPUTE**

“resolution of the issue was essential to a final judgment in the first action”

**NO
DISPUTE**

“[the party against whom collateral estoppel is being asserted] had a full and fair opportunity to litigate the issue in the first action”

Google LLC v. Hammond Dev. Int'l, Inc., 54 F.4th 1377, 1381 (Fed Cir. 2022)

Apple Fails to Distinguish the Issues

Apple arguments:

- ⦿ Different **record**
- ⦿ Different **arguments**
- ⦿ **Word-count** limited in IPR2022-01465
- ⦿ No finding that Sarantos and Shie are **incompatible**

But “[c]ollateral estoppel applies ‘even if new evidence exists.’”

SynQor, Inc. v. Vicor Corp., 988 F.3d 1341, 1355 (Fed. Cir. 2021)

And “an ‘issue’ must be understood broadly enough ‘to prevent repetitious litigation of what is *essentially* the same dispute’”

Id. at 1353

Apple's Arguments Are the Same

Apple's Prior Arguments

Apple asserts it would have been obvious “to use the light shape changing material of Shie in the wristwatch sensor of Sarantos in between LEDs 2208 and the user’s wrist tissue,” in order to: (1) “precisely direct the light emitted toward the tissue so as to increase power efficiency by shining light closer to photodiodes [2212], as light not incident on the photodiodes represents wasted power”; (2) “increase accuracy of measurements by directing light towards a larger area to decrease irregular readings caused by moles or other aberrations on the skin”; and/or (3) “obscure the LED’s appearance from a user.” Pet. 40–41; Ex. 1003 ¶ 119.

— IPR2022-01465 FWD
(EX2036), 139

Apple's 244 IPR Arguments

The present Petition also articulated numerous motivations to combine Sarantos and Shie beyond the three included in the earlier IPR proceeding (or the three mentioned in the POR (POR, 32)), including:

- “to more precisely direct the light emitted toward the tissue so as to increase power efficiency”
- to “increase[] the signal level of the light detected by the photodiodes”
- to “direct[] light towards a larger area to decrease irregular readings” and “reduce measurement errors caused by moles and skin aberrations”
- “to tune the light intensity to provide the most accurate physiological parameter detection”
- “to obscure appearance of the light source from a user”

— 244-Reply, 16

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- “to more precisely direct the light emitted toward the tissue so as to increase power efficiency”
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 - “to tune the light intensity to provide the most accurate physiological parameter detection”
 - “to obscure appearance of the light source from a user”

— 244-Reply, 16

A POSITA would have been motivated to implement region 2226 between LEDs 2208 and the user's wrist tissue in the device of Sarantos using a light shape changing material (as taught by Shie), to more precisely direct the light emitted toward the tissue so as to increase power efficiency by shining light closer to photodiodes, as light not incident on the photodiodes represents wasted power. APPLE-1003, ¶¶99-100. A POSITA would have understood that the “pulsatile component of absorption... is a small fraction of the received signal... used by the pulse oximeter instrument to perform its measurements,” and thus, “it is important that the incident light be of significant magnitude to result in transmitted signals that have sufficient amplitude to provide accurate readings.” APPLE-1022, 3:40-48; APPLE-1003, ¶100. A POSITA knew that directing the light emitted toward the tissue to shine light closer to the photodiodes increases the signal level of the light detected by the photodiodes to minimize power consumption while still providing adequate radiated power for pulse oximetry. APPLE-1009, 76, 105;

— 244-Pet., 32-33

Apple's Arguments Are the Same

The present Petition also articulated numerous motivations to combine Sarantos and Shie beyond the three included in the earlier IPR proceeding (or the three mentioned in the POR (POR, 32)), including:

- “to more precisely direct the light emitted toward the tissue so as to increase power efficiency”
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- to “direct[] light towards a larger area to decrease irregular readings” and “reduce measurement errors caused by moles and skin aberrations”
- “to tune the light intensity to provide the most accurate physiological parameter detection”
- “to obscure appearance of the light source from a user”

— 244-Reply, 16

APPLE-1009, 76, 105; APPLE-1008, [0050], [0064]. Regarding the first and second reasons, I described that use of the lenses disclosed by Shie in Sarantos’s wearable fitness monitor would have allowed a POSITA to tune the light intensity to provide the most accurate physiological parameter detection. 244-APPLE-1003, ¶¶100-101.

— 244-EX1079, ¶74

-244 IPR Sarantos-Shie Grounds
Motivation to Combine / Changing Shape
(all claims)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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Apple Fails to Explain the Combination

IPR2022-01465 FWD:

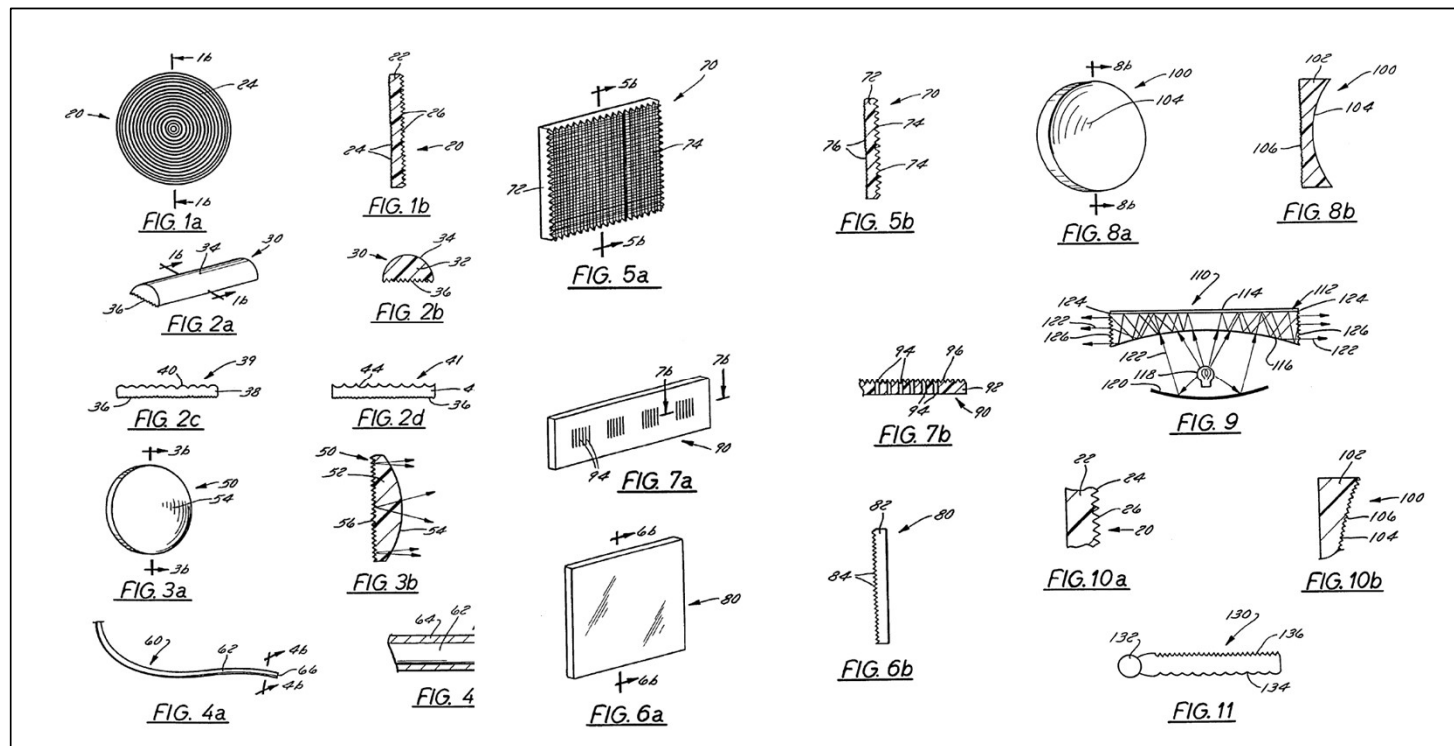
“[I]t is impossible to evaluate the merits of [Apple’s motivations to combine] without first identifying a particular lens structure for use in Sarantos’s Figure 22 sensor. We reject the notion that *any* light shape changing material would have achieved these three benefits in Sarantos’s Figure 22 sensor.”

— EX2036, 143-44 (emphasis in original)

- ⦿ 244 Petition still did not identify which “diffuser” from Shie to use with Sarantos

What Is the Combination?

Sarantos + ?



— EX1007 (Shie), Figs. 1-11

241 and 243 IPRs

241 and 243 IPRs Grounds

241 IPR ('743 Patent)		
Ground	Claims	References
1A	1-6, 9-13, 24,25	Iwamiya + Sarantos
1B	7	Iwamiya + Sarantos + Utter
1C	8	Iwamiya + Sarantos + Han
1D	14-21	Iwamiya + Sarantos + Utter + Han
1E	22-23	Iwamiya

243 IPR ('159 Patent)		
Ground	Claims	References
1A	1-2, 4-13	Iwamiya + Sarantos
1B	3	Iwamiya + Sarantos + Han
1C	14-25	Iwamiya + Sarantos + Utter

*Apple relies on Han/Utter for elements not in dispute

-241 and -243 IPRs
Claim Construction
('743 Patent Claims 1-21)
('159 Patent Claims 1-13 and 19-25)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

40

Applied Relied on Construction It Contends Is Wrong

Apple in District Court (D. Del.)

- ⊕ Apple's expert: the plain meaning of "opening" is "empty space" and "[a] POSITA would not regard solid material as an 'opening.'"

— EX2098, ¶465

- ⊕ Apple's expert: Apple Watches do not satisfy "opening" element because their openings are "filled with solid material, not empty space."

— EX2098, ¶¶465, 478-482

Apple Here

- ⊕ "Iwamiya's optical filter 17 satisfies the claim term 'opening.'"

— 241 Reply 3, 243 Reply 3

Petitioner Cannot Rely Only on Construction It Contends Is Wrong

- ⦿ Petitioner fails to satisfy its obligations “by conducting unpatentability analysis only under a claim construction with which it expressly disagrees”

— *Hologic, Inc. v. Enzo Life Sciences, Inc.*,
IPR2018-00019, Paper 21 at 2-3, 7 (Nov. 28, 2018)

- ⦿ Applies to petitioner contradicting construction its district court construction

— *Cambridge Mobile Telematics, Inc. v. Sfara, Inc.*,
IPR2024-00952, Paper 12 at 5-9 (Dec. 13, 2024) (informative)

— *Samsung Elecs. Am., Inc. v. Cobblestone Wireless*,
IPR2024-00319, Paper 16 at 19-21 (June 24, 2024)

- ⦿ Masimo’s construction = irrelevant because Apple has the burden

— *Samsung Elecs. Am., Inc. v. Cobblestone Wireless*,
IPR2024-00319, Paper 16 at 9-10 (June 24, 2024)

-241 and -243 IPRs
Surface, Dark Coating, Opening
('743 Patent Claims 1-21)
('159 Patent Claims 1-13 and 19-25)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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241 and 243 IPR Claim Language

241 IPR ('743 Patent)

Independent Claims 1, 14) *(and dependent Claims 2-13 and 15-21)*

a surface comprising a dark-colored coating, the surface positioned between the plurality of detectors and the tissue, wherein an opening defined in the dark-colored coating is configured to allow at least a portion of light reflected from the tissue to pass through the surface

243 IPR ('159 Patent)

Independent Claims 1, 19 *(2-13 and 20-25)*

a surface comprising a dark-colored coating, the surface positioned between the plurality of detectors and the tissue when the physiological monitoring device is in use, wherein an opening defined in the dark-colored coating is configured to allow at least a portion of light reflected from the tissue to pass through the surface

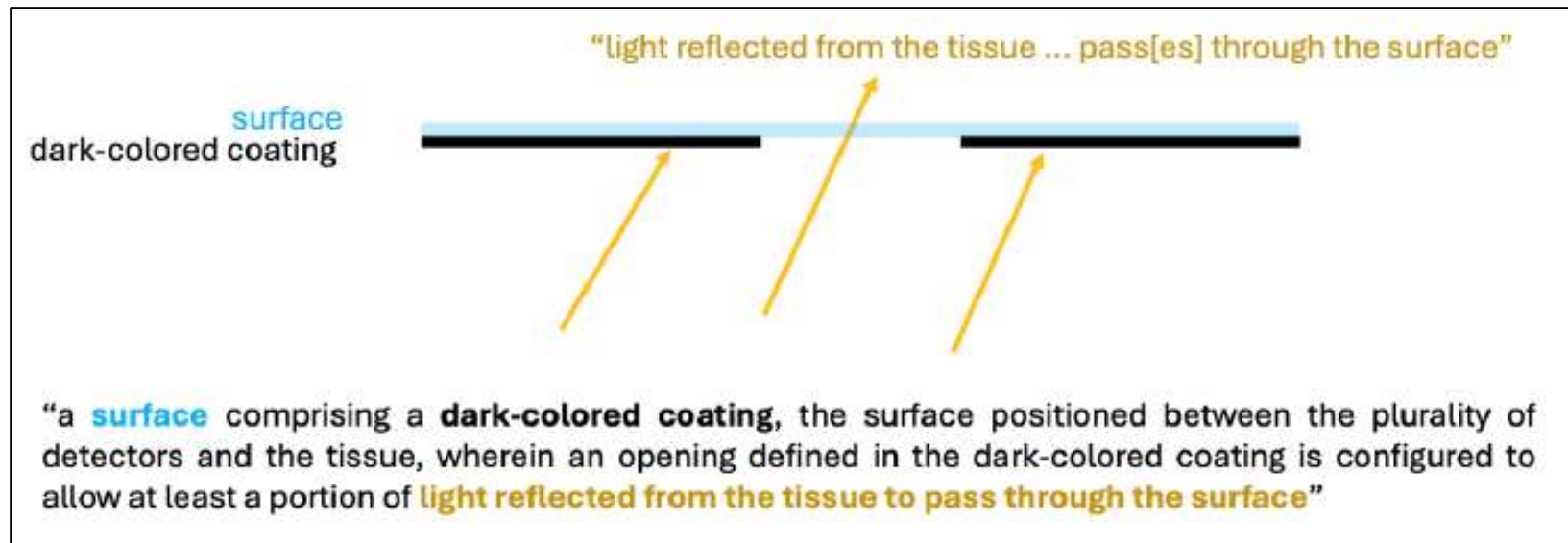
The '159 and '743 Patents Describe a Planar Surface

- ⊕ Apple's Reply: the '159 and '743 Patents “describe[] ‘a planar surface having an opening 402 through which the emitted light may pass. . .”

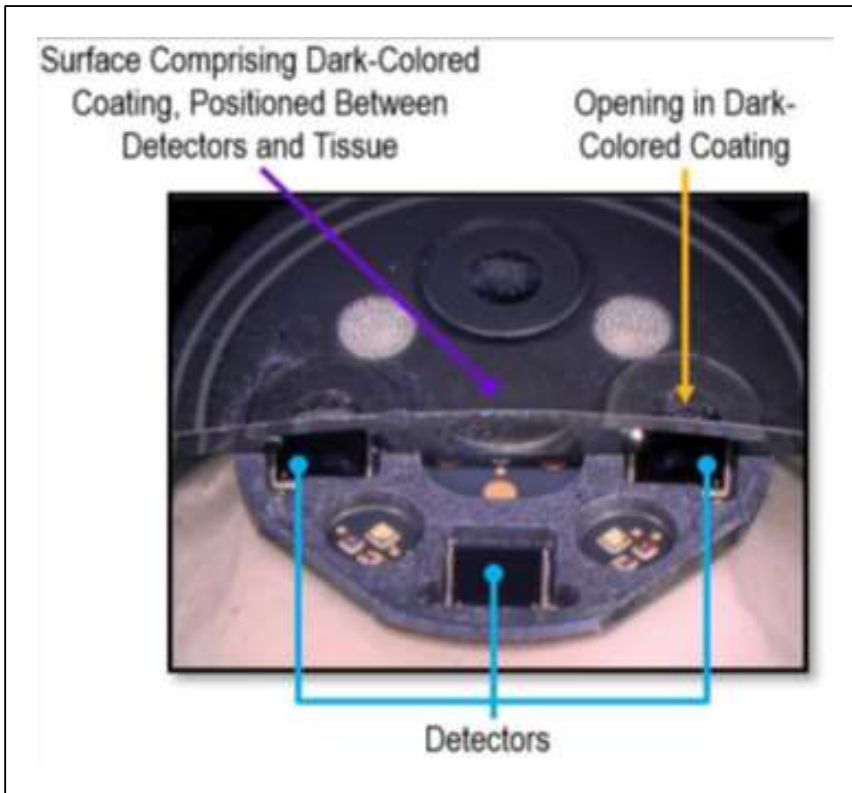
The light-absorbing detector filter 306, which is also depicted in FIG. 4A in a top view, is a planar surface having an opening 402 through which the emitted light may pass
35 after being attenuated by the tissue measurement site 102. In

— 241 Reply 10, 243 Reply 9 (quoting EX1001, 8:32-53)

Surface With Dark-Colored Coating



The Apple Watch Exemplifies The Claims



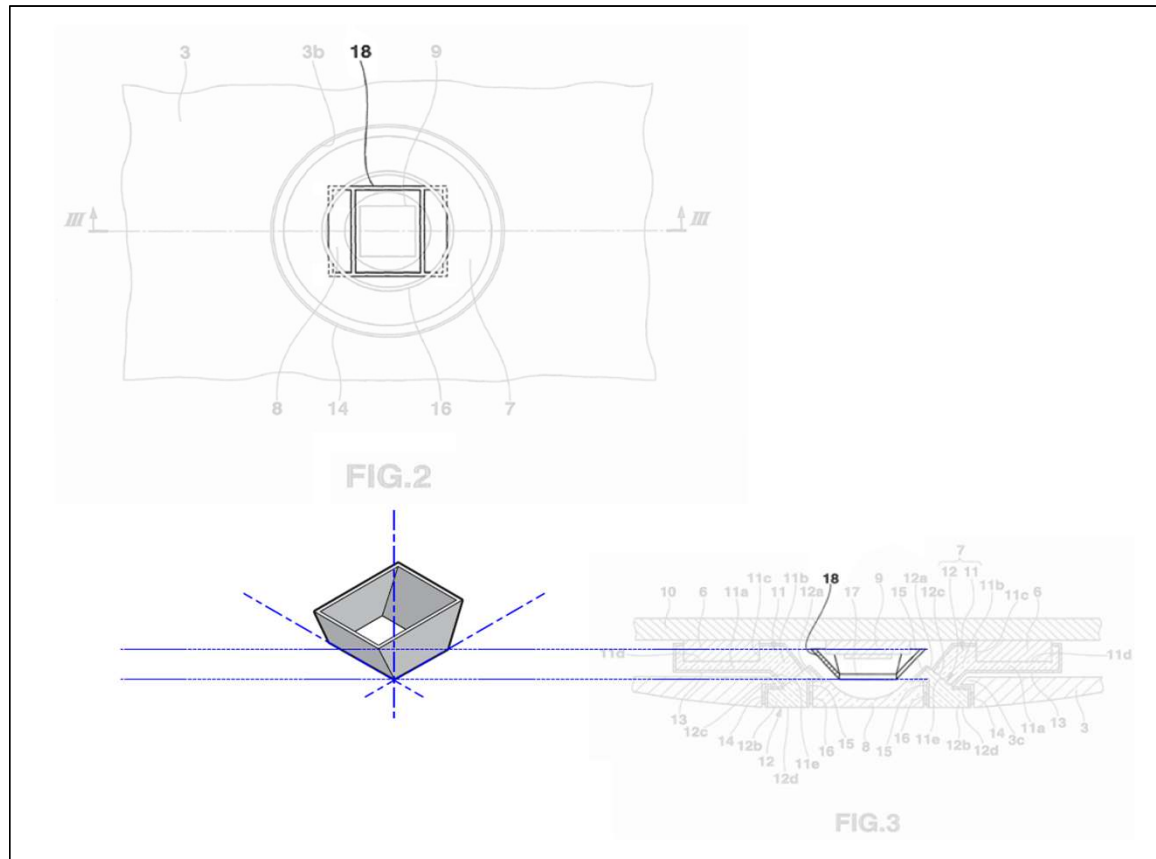
Iwamiya Discusses A Fundamentally Different Structure

Q The light shielding frame 18 has four sides; right?

A Well, I mean, if you're just talking about the external convex hull –or not even convex hull – external perimeters, it's rectangular in nature. It has – a rectangle has four sides, but there's multiple surfaces there.

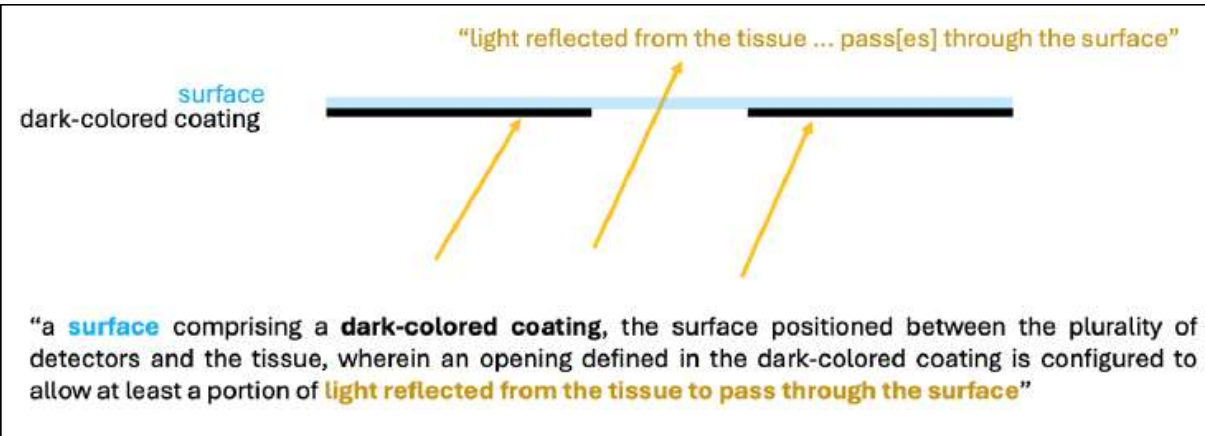
— EX2111, 76:11-17

Iwamiya Discusses A Fundamentally Different Structure

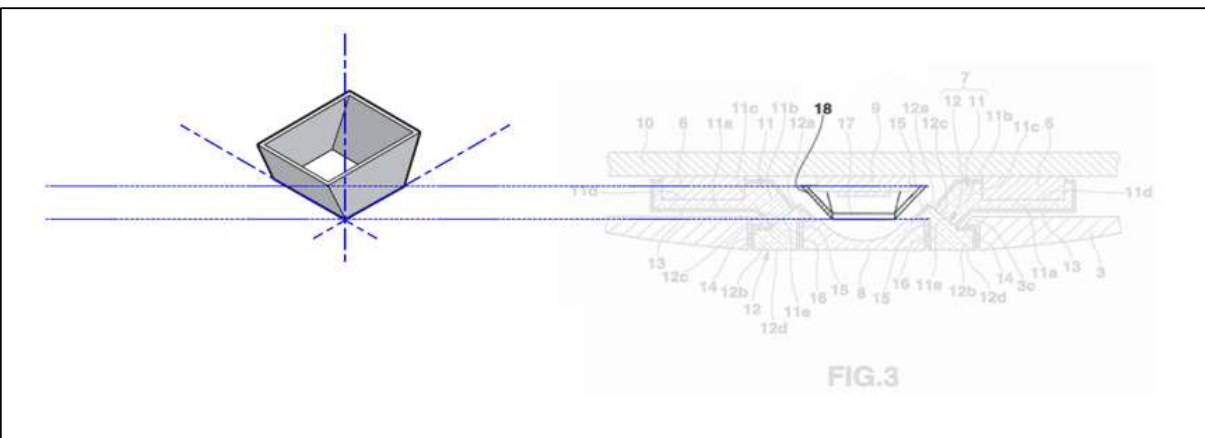


Iwamiya-Sarantos Discusses A Fundamentally Different Structure

Claim Language:



Iwamiya:



-241 POR 23-26; EX2100 ¶¶76-80; 241 Sur-Reply 7, EX1004, Figs. 2-3 (annotated); demonstrative isometric drawing

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

50

Apple's Description of Iwamiya

“As shown in FIG. 2 (below), the light shielding frame 18 ‘surround[s]’ the light receiving unit 9 and has an opening that allows light to pass through the surface:”

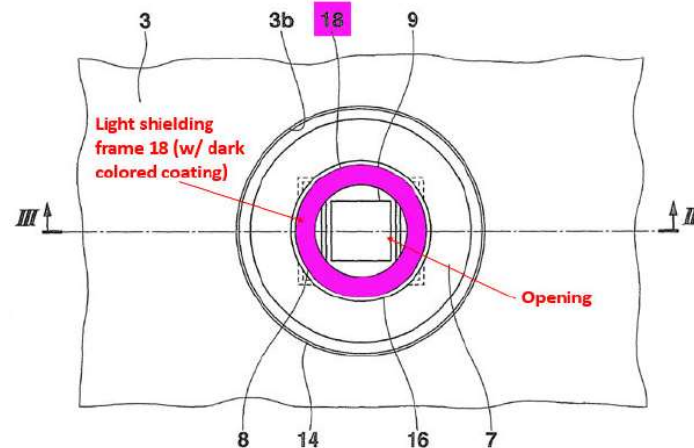
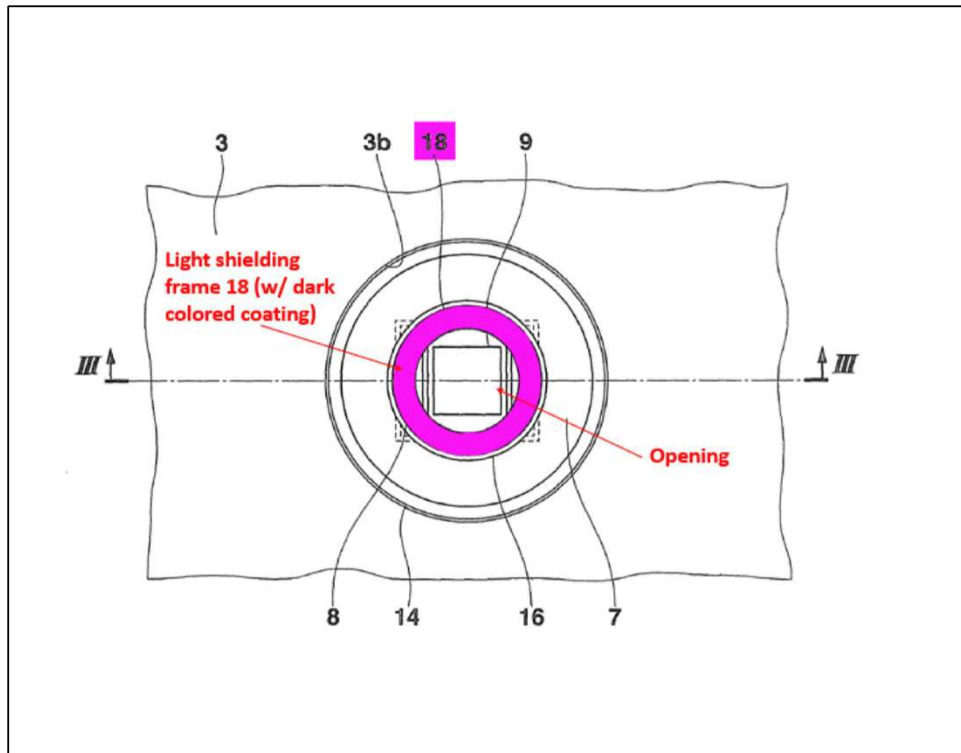
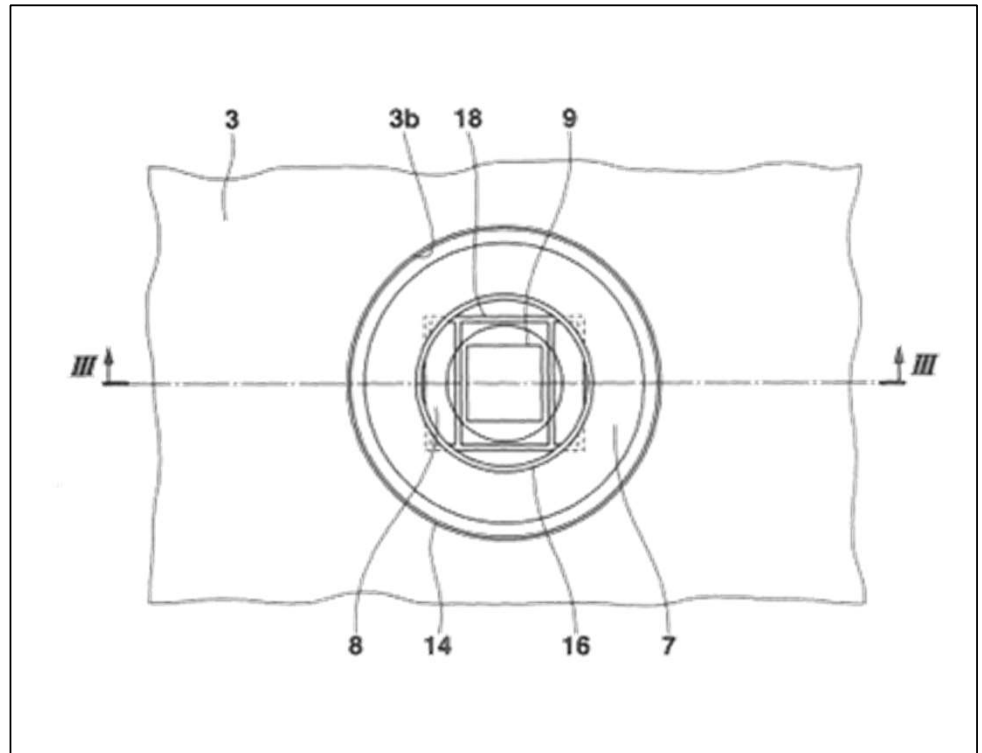


FIG.2

— EX2111, 76:11-17

Apple Relies on a Coating on Scattered Light Taking Unit 8, Not Light Shielding Frame 18

241/243 IPRs, Iwamiya-Sarantos

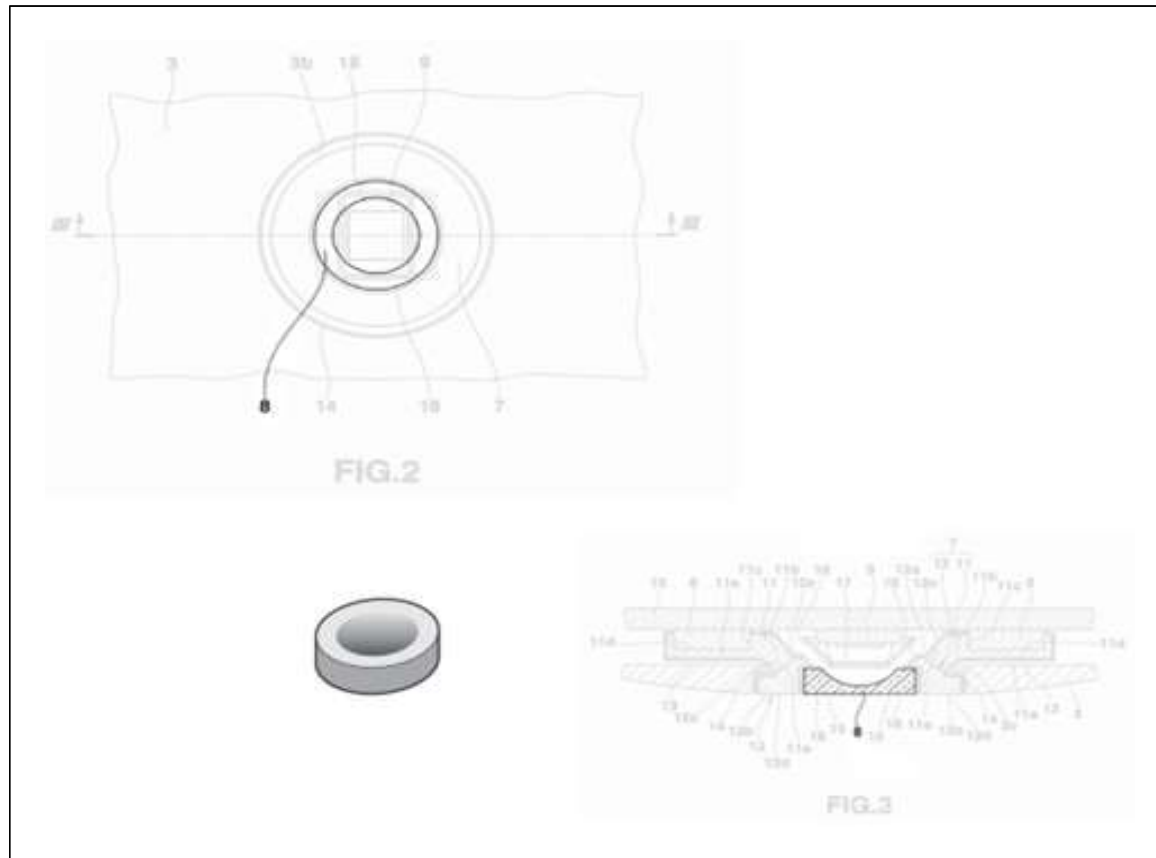


241 Sur-Reply 4-5; 241 Reply 8-9 (annotating Iwamiya Figure 2);
EX1004, Fig. 2

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EVIDENCE

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Scattered Light Taking Unit 8 Is a Circular Concave Lens



241 Sur-Reply 5-6, EX1004, Figs. 2-3 (annotated);
demonstrative isometric drawing,

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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A POSITA Would Not Modify Iwamiya With Dark Coating

- ⊙ Iwamiya's light shielding frame 18 already shields light
- ⊙ Iwamiya relies on reflective material to direct emitted light to the photodetector
 - Does not specify what material 18 is made from
 - All other embodiments use metal **reflective** holder portion 43
- ⊙ POSITA would have no reason to look to other references for light shielding material. Certainly not dark coating.

241, 243, 244 IPRs Expectation Of Success / Objective Evidence

Claims Reciting Oxygen Saturation at the Wrist

'743 Patent Claim 18	'159 Patent Claim 8	'159 Patent Claim 17
<p>14. A physiological measurement device comprising: one or more optical sources configured to emit light of one or more wavelengths in an initial light pattern proximate a wrist of a user ... a processor configured to ... determine a physiological parameter of the user responsive to the one or more signals</p> <p>18. The physiological measurement device of claim 14, wherein the physiological parameter is oxygen saturation.</p>	<p>1. A physiological monitoring device comprising ... a material positioned between the plurality of emitters and a tissue measurement site on a wrist of a user ... a processor configured to ... determine a physiological parameter of the user responsive to the one or more signals.</p> <p>8. The physiological monitoring device of claim 1, wherein the physiological parameter comprises oxygen saturation.</p>	<p>14. A physiological monitoring device comprising ... a diffuser configured to be positioned between the plurality of optical sources and a tissue measurement site on the wrist of the user ... a processor configured to ... determine a physiological parameter to the user responsive to the one or more signals</p> <p>17. The physiological monitoring device of claim 14, wherein the physiological parameter comprises oxygen saturation.</p>

Sarantos: Sensor “Not Tailored” for “Dramatically Different” Red & Infrared Light

Apple’s Petition: “[W]rist-worn pulse oximetry sensors, **such as that described in Sarantos**, were well-known in the art.”

Sarantos:

for measuring heart rate. In contrast, other photoplethysmographic techniques, such as techniques for measuring blood oxygenation levels, may be most effective using light of dramatically different wavelengths, such as in the red wavelengths, e.g., 660 nm, or in the infrared spectrum. The aspect ratios and dimensional values discussed herein are tailored based on the green/yellow light spectrum and are not tailored for use in other spectrums, such as the red or infrared spectra.

— EX1005, 18:44-51

Iwamiya Could Not Measure Spo2

- ⊙ **Never** mentions oxygen saturation.
- ⊙ Apple conceded Iwamiya does not measure oxygen saturation
— EX2099, 50:2-51:18
- ⊙ Measures **only one wavelength** in non-visible spectrum (940 nm infrared)
— EX1004, 10:34-38, 11:19-23, 241-EX2100, ¶¶87
- ⊙ **Filters out** visible light, including red light used for oxygen saturation
— EX1004, 8:37-47, Figs. 3-4, 8; EX2002-1291, ¶¶83, 241-EX2100, ¶¶91-95
- ⊙ Teachings not limited to users with darker skin
— EX1004, 8:42-47, 13:17-21.

No Reasonable Expectation of Success

“While absolute certainty is not necessary to establish a reasonable expectation of success ... ***there can be little better evidence negating an expectation of success than actual reports of failure.***”

— *Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1354 (Fed. Cir. 2003)

Apple Did Not Release a Wrist SpO₂ Device Until 2020

- ⌚ **Apple development:** began developing SpO₂ for the wrist in 2014, but did not release until September 2020.
- ⌚ **Apple engineer Land:** SpO₂ at the wrist was “unprecedented”
- ⌚ **Apple engineer Manheimer:** “I don’t know if it can be done”

****Additional evidence in confidential session****

Failure of Others / Long-Felt Need

- ⌚ **No available devices** measured SpO₂ at the wrist in 2015
 - Apple failed to measure SpO₂ did not release until 2020
 - Fitbit (Sarantos assignee) did not release SpO₂ at wrist until 2020
 - Withings wrist worn device had to be removed and placed on finger to measure SpO₂



Apple's Reply: No dispute

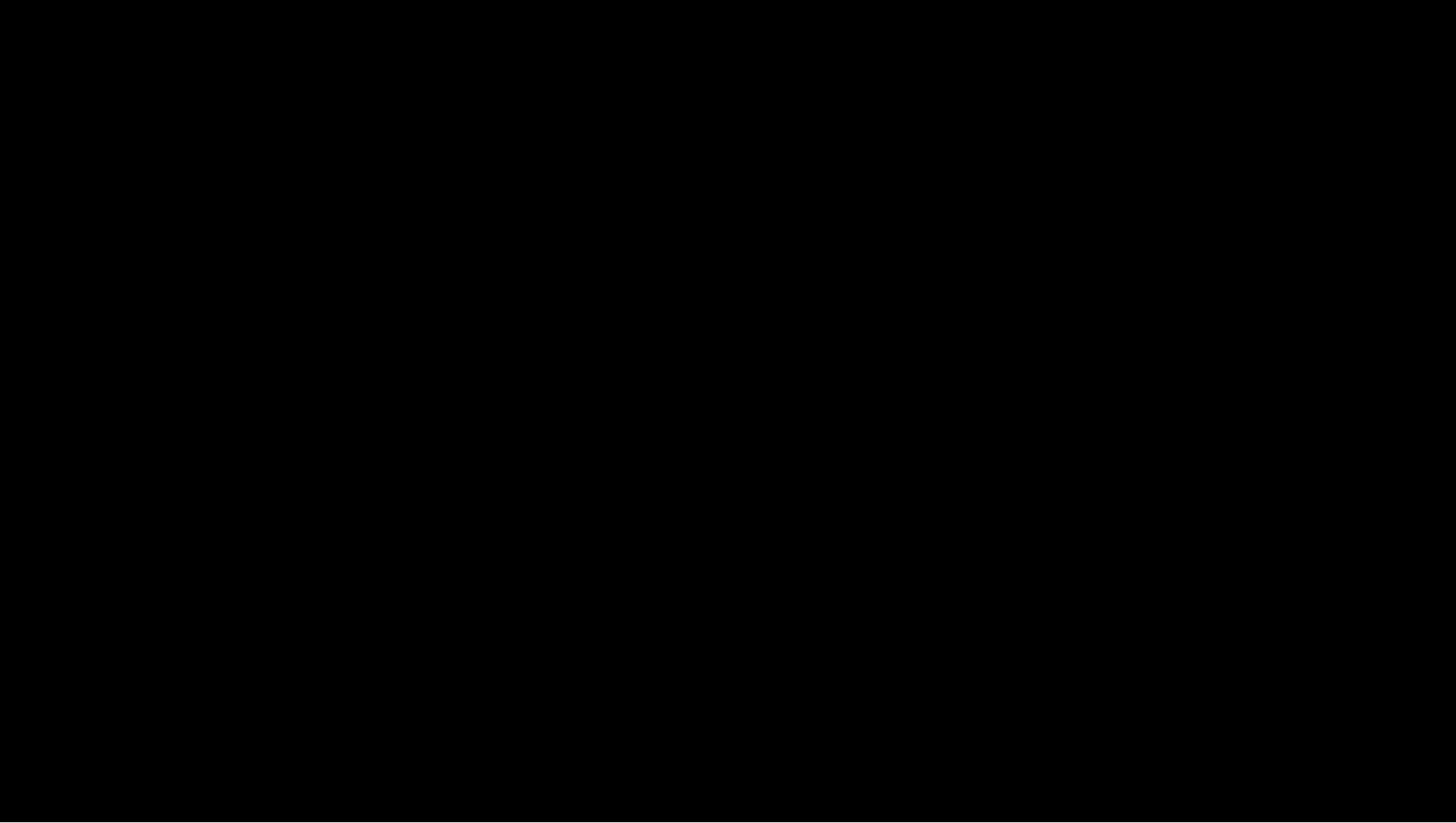
Industry Skepticism

- ⊙ **Dr. Mannheimer (2014-2015):** “good luck with that,” “I don’t know if it can be done.”
 — EX2077, 1012:12-22, EX2080, 173:14-174:6
- ⊙ **Dr. Shui:** most challenging part was “related to the position of the Apple Watch blood oxygen sensor” on the wrist
 — EX2082, 108:13-21
- ⊙ **Dr. Waydo:** “extremely challenging” to develop blood oxygen feature.
 — EX2008, 938:21-24.
- ⊙ **Fitbit (2020):** “pretty hard technical problem to measure SpO₂ on the wrist”
 — EX2088, 4
- ⊙ **Mr. Land:** blood oxygen sensing at wrist was “unprecedented” and “there were no commercially available products” in 2014-2015.
 — EX2076, 964:2-6
- ⊙ **Withings (2014):** Worn on the wrist, but measured on the finger

Apple’s Reply: **No dispute**

Confidential Session (Apple-Specific Evidence)

**CONTAINS CONFIDENTIAL BUSINESS INFORMATION
SUBJECT TO PROTECTIVE ORDER**



241-POR, 46, 59-60, 241-EX2100, ¶109.

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EVIDENCE

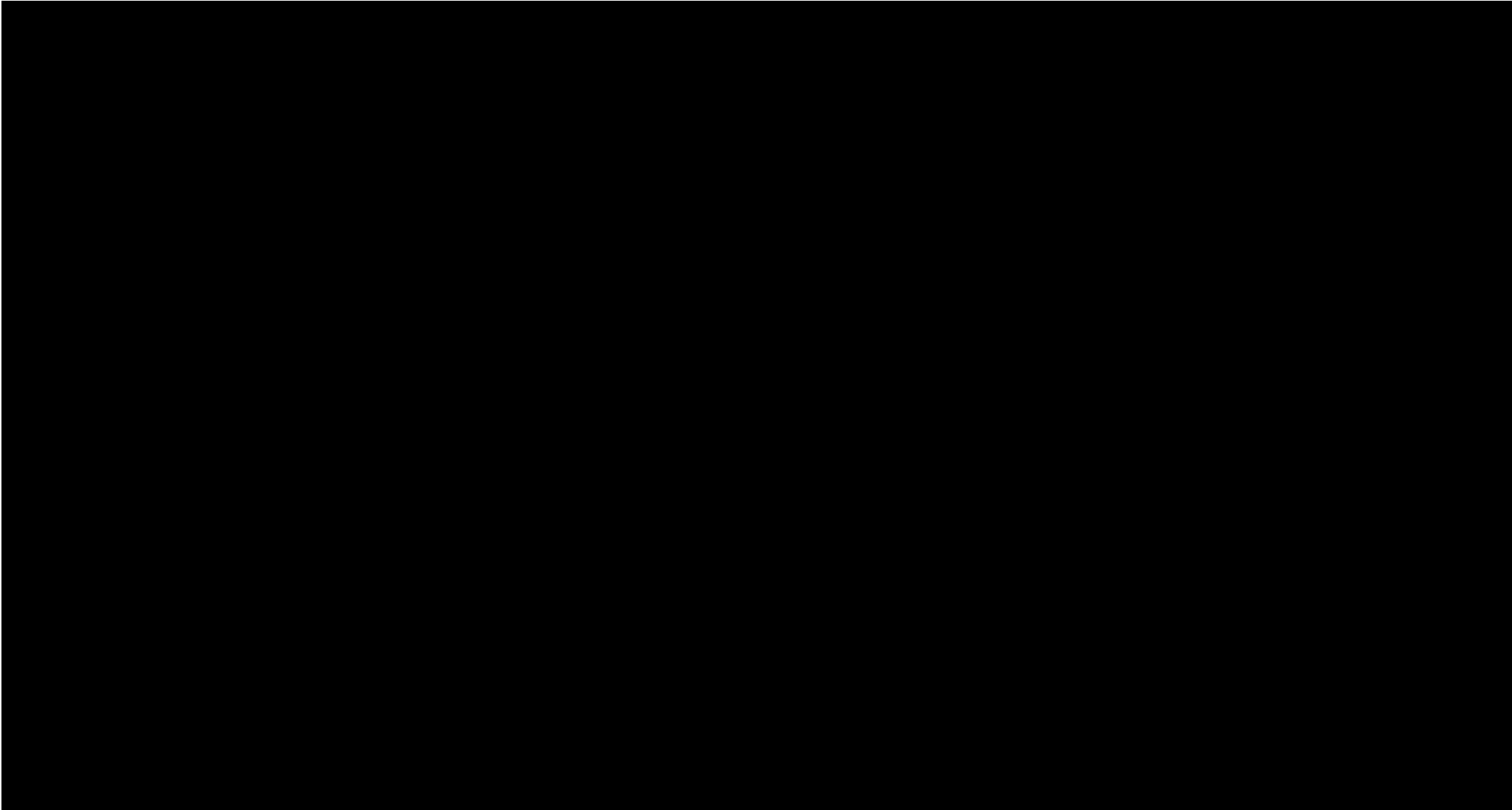
64

241-POR, 40-41; 241-EX2100, ¶102 ; EX2076, 963:10-15;
EX2080, 173:9-173:13

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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MASIMO 2112
Apple v. Masimo
IPR2024-00244



241-POR, 59; 241-EX2100, ¶104; EX2078 at 919:1-14, 920:3-6;
EX2081 at 165:12-16, 166:4-166:18

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EVIDENCE

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241-POR, 51-55; 241-Sur-Reply, 16; EX2100 ¶¶117-119;
EX2086, EX2101-EX2104

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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EX2035, 47, 96; 243-POR, 48-53; 243-EX2100, ¶¶112-113

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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Additional Material

Status of Related '745 Patent

ITC Inv. No 337-TA-1276

- ⦿ Upheld validity of asserted claims 9, 18, 27 asserted
 - No reasonable expectation of success, industry skepticism, failure of others

IPR2022-01291 & IPR2022-01465

- ⦿ Claims 1-12, 14-24 unpatentable over Iwamiya-Sarantos
 - Masimo appealed (Appeal Nos. 24-1635, -1636)
- ⦿ Claims 13, 25 not unpatentable under Iwamiya-Sarantos or Sarantos-Shie (no motivation to combine)
 - Apple did not appeal

Undisputed Judicial Estoppel Arguments

Undisputed: Apple succeeded in obtaining noninfringement of the related '745 Patent at the ITC by arguing MLA does not change the shape of light

Undisputed: Apple's position would unfairly prejudice Masimo.

- Apple's no-shape-change argument was the ***only*** reason the ITC did not issue an exclusion order based on the '745 Patent
- Masimo satisfied all other requirements for domestic industry and validity at the ITC

244 IPR Sarantos Grounds
Plurality Of Photodiodes In Claimed Array
(Claims 5, 14-18, 25)

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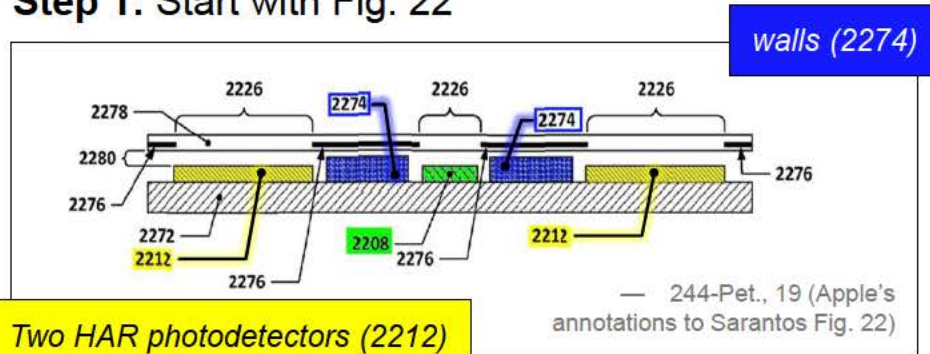
84

Relevant Element (Claims 5, 14, 25)

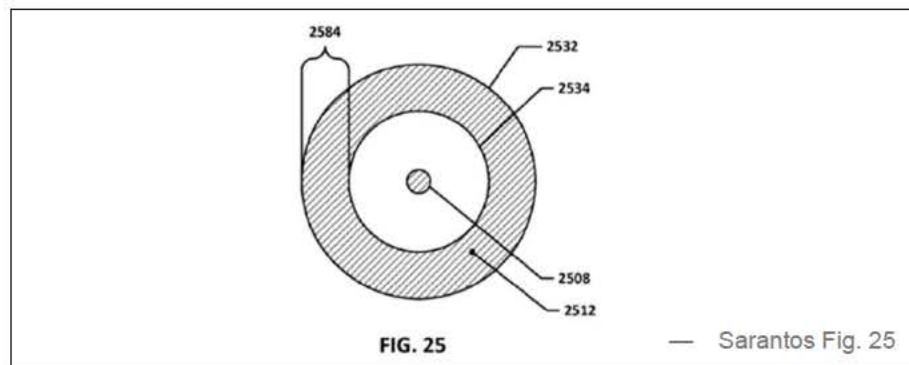
Dependent Claim 5	Independent Claim 14 (and dependent Claims 15-18)	Dependent Claim 25
<p>The physiological monitoring device of claim 1, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of a portion of the tissue measurement site bounded by the light block.</p>	<p>A physiological monitoring device comprising ... a light block having a circular shape; a plurality of detectors configured to detect at least a portion of the light after the light passes through a portion of the tissue measurement site bounded by the light block, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of the portion of the tissue measurement site bounded by the circular shaped light block ...</p>	<p>The system of claim 19, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of a portion of the tissue measurement site bounded by the light block.</p>

Apple's Multi-Step Combo Driven by Hindsight

Step 1: Start with Fig. 22

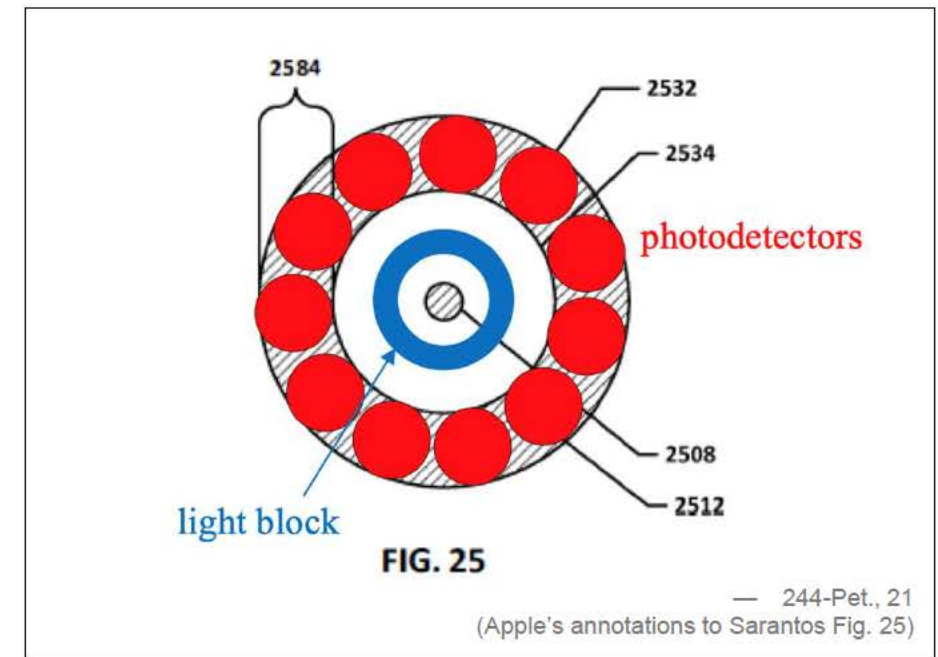


Step 2: Combine with Fig. 25 (single annular photodetector, no light block)



Step 3: Modify walls 2274 in Fig. 22 to be circular

Step 4: Break up the annular photodetector into 11 smaller detectors



-241 and -243 IPRs
Different Width and Length
(’743 Patent Claim 9)

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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241 and 243 IPR Claim Language

241 IPR ('743 Patent)

Claim 9

9. The physiological measurement device of claim 1, wherein the output light pattern comprises a width and a length, and wherein the width is different than the length.

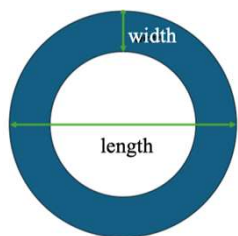
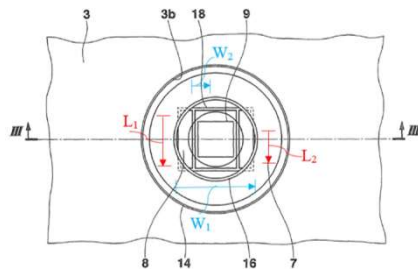
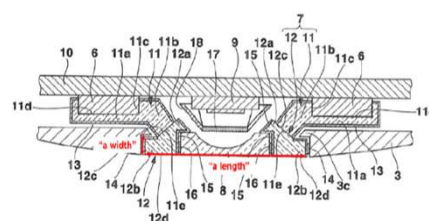
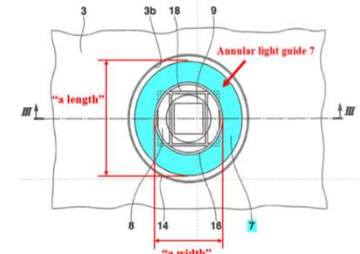
Apple Fails to Show a Light Pattern with a Different Width and Length ('743 Patent Claim 9)

⊙ Apple asserts four different theories

— 241 Reply 30-31, Sur-Reply 25-26

⊙ Board in IPR2022-01465: “Dr. Anthony’s perceived need to present three different attempts to identify a ‘length’ and a ‘width’ within an annulus shape detracts from the weight of his testimony on this point.”

— 241 Sur-Reply 25-26, EX2036 134



DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

241 and 243 IPRs
Detector Array
('743 Patent Claims 5, 21-25)
('159 Patent Claims 5, 14-18, 25)

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EVIDENCE

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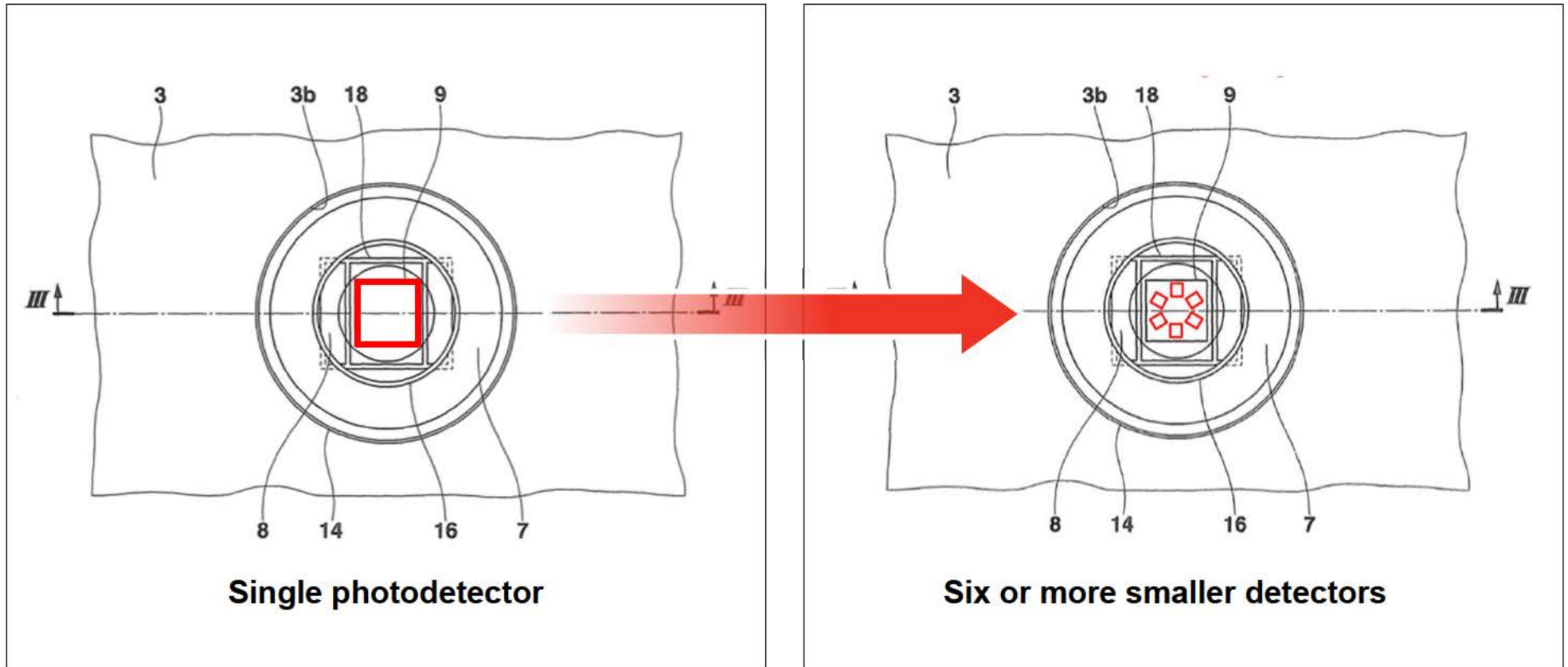
'743 Patent Relevant Element (Claims 5, 21, 22)

Dependent Claim 5	Dependent Claim 21	Independent Claim 22 (and Dependent Claims 23-25)
The physiological measurement device of claim 1, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of a portion of the tissue measurement site bounded by the light block.	The physiological measurement device of claim 14, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of a portion of the tissue measurement site bounded by the light block.	A physiological measurement device comprising ... a circular shaped light block; a plurality of detectors ... wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of the portion of the tissue measurement site bounded by the circular shaped light block ...

'159 Patent Relevant Element (Claims 5, 14, 25)

Dependent Claim 5	Independent Claim 14 (and dependent Claims 15-18)	Dependent Claim 25
<p>The physiological monitoring device of claim 1, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of a portion of the tissue measurement site bounded by the light block.</p>	<p>A physiological monitoring device comprising ... a light block having a circular shape; a plurality of detectors configured to detect at least a portion of the light after the light passes through a portion of the tissue measurement site bounded by the light block, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of the portion of the tissue measurement site bounded by the circular shaped light block ...</p>	<p>The system of claim 19, wherein the plurality of detectors are arranged in an array having a spatial configuration corresponding to a shape of a portion of the tissue measurement site bounded by the light block.</p>

Apple's Modification to Iwamiya:

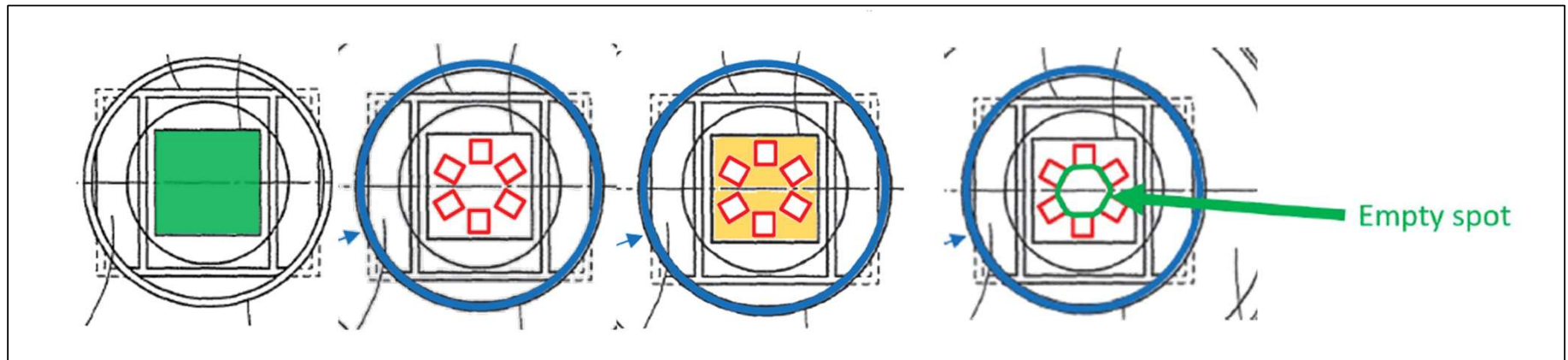


241-Pet., 38; 241-POR, 62-64

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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Apple Asserts Modification Increases Detection Area But Actually Does The Opposite



- ⦿ Substantially decreases light sensitivity by over 50%
- ⦿ Worse signal-to-noise ratio
- ⦿ No light detection at center

Nonsense to Focus Light to Area without Photodetector

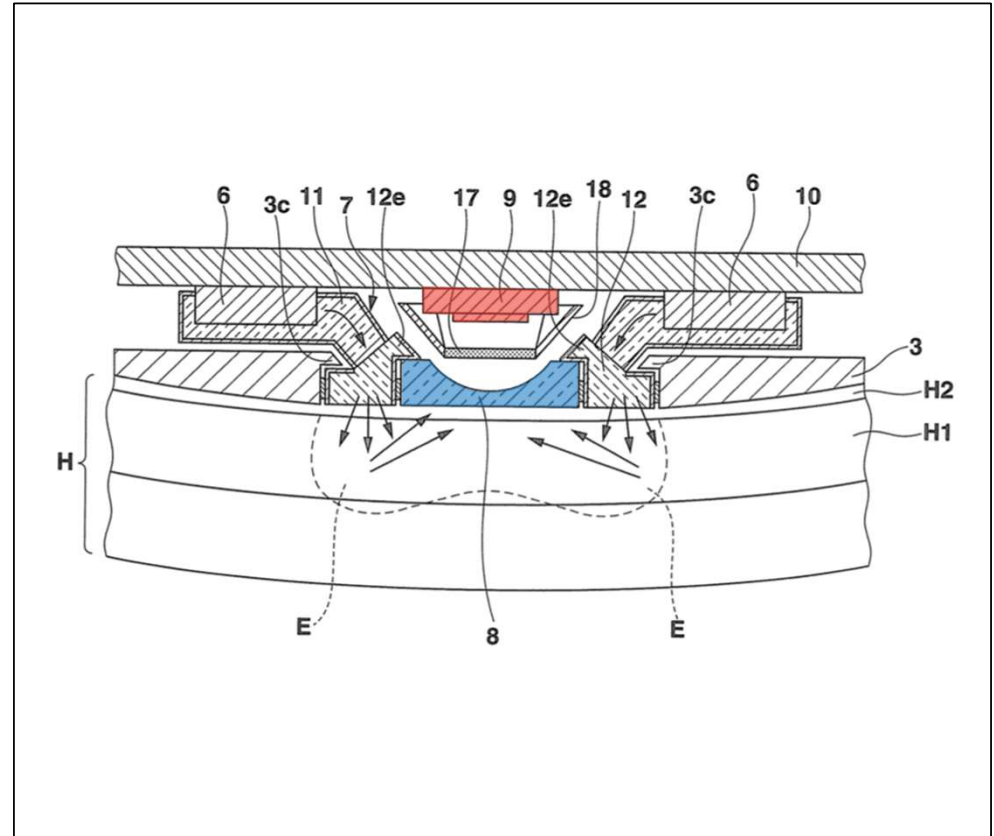
① Board in IPR2022-01291:

Scattered light taking unit 8 “is a transparent lens to focus the light on **light receiving unit 9**”

② Dr. Madisetti:

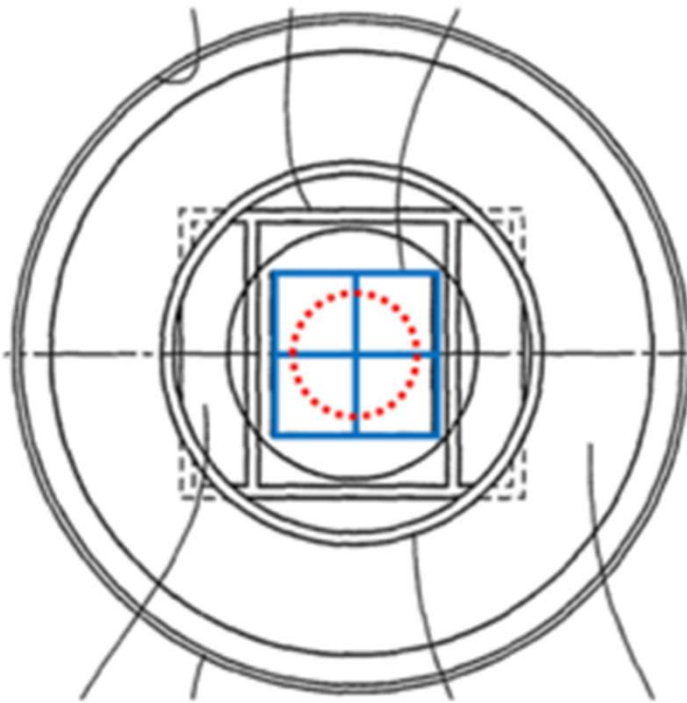
“A POSITA would not have understood Iwamiya to propose such a strange and detrimental design. Such a design would be **severely detrimental** to sensor performance by reducing photodetector coverage.”

“It makes **no sense** for Iwamiya’s sensor design to focus light using the scattered light taking unit 8 to a spot where there is no photodetector coverage.”

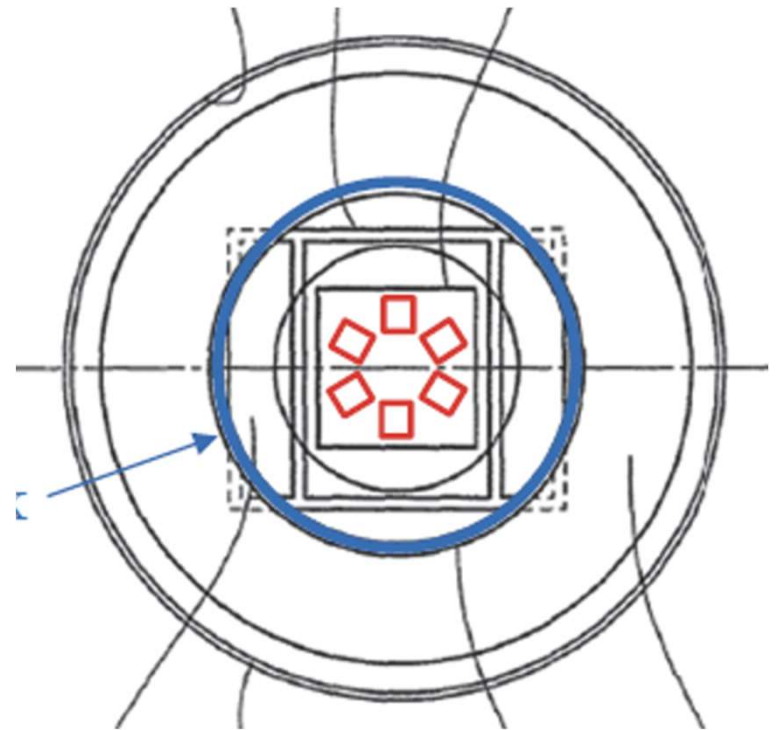


Iwamiya's "Circumference": Does Not Teach Reduced Signal Strength

IWAMIYA: DO THIS



NOT THIS



241-POR, 65-67; 241-EX2100, ¶¶138-139

DEMONSTRATIVE EXHIBIT – NOT
EVIDENCE

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