

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

|                                                                                                                                                                        |                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| APPLE INC.,<br><br><i>Plaintiff,</i><br><br>v.<br><br>MASIMO CORPORATION and<br>SOUND UNITED, LLC,<br><br><i>Defendants.</i>                                           | C.A. No. 22-1377-MN-JLH<br><br><b>JURY TRIAL DEMANDED</b> |
| MASIMO CORPORATION, SOUND<br>UNITED, LLC<br><br><i>Counter-Claimants,</i><br><br>v.<br><br>APPLE INC.<br><br><i>Counter-Defendant.</i>                                 |                                                           |
| APPLE INC.,<br><br><i>Plaintiff,</i><br><br>v.<br><br>MASIMO CORPORATION and<br>SOUND UNITED, LLC,<br><br><i>Defendants.</i>                                           | C.A. No. 22-1378-MN-JLH<br><br><b>JURY TRIAL DEMANDED</b> |
| MASIMO CORPORATION,<br>CERCACOR LABORATORIES, INC.,<br>SOUND UNITED, LLC<br><br><i>Counter-Claimants,</i><br><br>v.<br><br>APPLE INC.<br><br><i>Counter-Defendant.</i> |                                                           |

**EXPERT REPORT OF MAJID SARRAFZADEH, Ph.D. REGARDING NON-  
INFRINGEMENT OF U.S. PATENT NOS. 10,687,743 & 10,722,159**

Signed:   
Date: December 15, 2023

**MASIMO 2098  
Apple v. Masimo  
IPR2024-00243**

























**B. The Asserted Claims**

131. I understand that Masimo alleges that Apple has infringed claims 1, 11, 12, 14, 18, and 19 of the '743 patent and claims 1, 7, 8, 19, and 22 of the '159 patent.

132. The asserted claims of the '743 patent are copied below:

[1 preamble] 1. A physiological measurement device comprising:

[1A] one or more emitters configured to emit light in an initial light pattern;

[1B] an optical transmission material configured to be positioned between the one or more emitters and a tissue measurement site, wherein the optical transmission material is configured to alter a direction of at least a portion of the light emitted from the one or more emitters to shape an output light pattern by which the emitted light is directed toward a surface of the tissue measurement site, wherein the output light pattern comprises a different geometric shape than the initial light pattern;

[1C] a plurality of detectors configured to detect at least a portion of the light after passing through tissue, the plurality of detectors further configured to output at least one signal responsive to the detected light;

[1D] a light block configured to prevent at least a portion of the light emitted from the one or more emitters from reaching the plurality of detectors without first reaching the tissue;

[1E] a surface comprising a dark-colored coating, the surface positioned between the plurality of detectors and the tissue,

[1F] 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; and

[1G] 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.

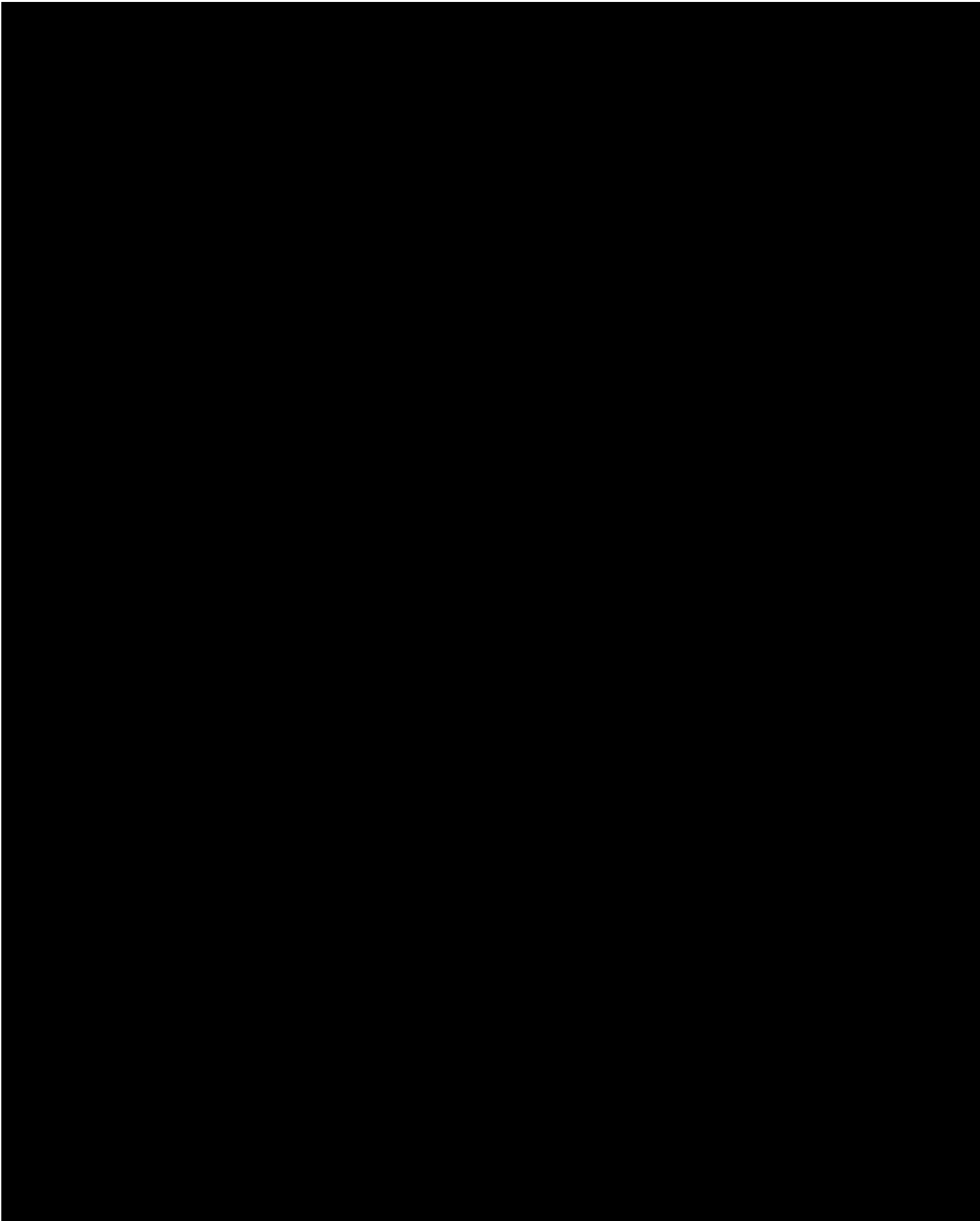
11. The physiological measurement device of claim 1, wherein the physiological parameter is oxygen saturation.

12. The physiological measurement device of claim 1, wherein the physiological parameter is pulse rate.

[14 preamble] 14. A physiological measurement device comprising:

[14A] 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;













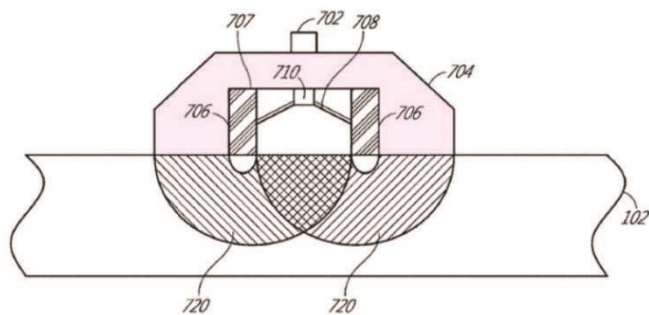


FIG. 7A

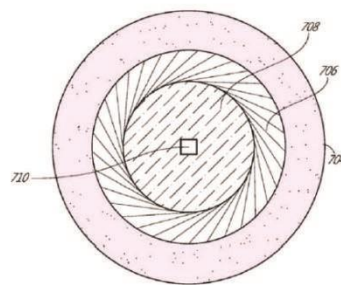


FIG. 7B

142. As can be seen above, emitter 702 is directly in contact with material 704 such that the shape of the light emitted from emitter 702 immediately enters material 704. In the example above, light having a non-annular shape enters the material 704 and light having an annular shape exits that material.

### C. Related ITC Proceeding

143. I understand that Masimo filed an action in the United States International Trade Commission alleging Apple infringed U.S. Patent No. 10,912,501 (“the ’501 Patent”); U.S. Patent No. 10,912,502 (“the ’502 Patent”), U.S. Patent No. 10,945,648 (“the ’648 Patent”), U.S. Patent No. 10,687,745 (“the ’745 Patent”), and U.S. Patent No. 7,761,127 (“the ’127 Patent”).<sup>177</sup> I understand the ’745 Patent at issue in the ongoing International Trade Commission matter is related to the ’743 Patent and ’159 Patent at issue here.<sup>178</sup>

144. The ’745 Patent claims at issue in the ITC proceeding are almost identical to the patent claims of the ’743 Patent and ’159 Patent Masimo asserts here. I have illustrated this in the

<sup>177</sup> *Certain Light-Based Physiological Measurement Devices and Components Thereof*, ITC Inv. No. 337-TA-1276, Complaint, Doc. ID 745719 (Complaint) (Jun. 30, 2021).

<sup>178</sup> I understand the patents involved in the International Trade Commission matter are stayed with respect to this litigation until the conclusion of the ITC investigation. Accordingly, if asked, I will supplement my report and analysis regarding those patents at the appropriate time if the stay is lifted.

chart below in regard to Claim 1. In the chart, I have highlighted some of the slight differences in the claim language and note that the order of limitations 1[D] and 1[E] is reversed for the '743 Patent as compared to the '159 and '745 Patents.

| Claim  | '745 Patent (ITC)                                                                                                                                                                                                                                                                                                                                                                            | '159 Patent                                                                                                                                                                                                                                                                                                                                                                                        | '743 Patent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1[pre] | A physiological <b>monitoring</b> device comprising:                                                                                                                                                                                                                                                                                                                                         | A physiological <b>monitoring</b> device comprising:                                                                                                                                                                                                                                                                                                                                               | A physiological <b>measurement</b> device comprising:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 1[A]   | a plurality of light-emitting diodes configured to emit light in a <b>first shape</b> ;                                                                                                                                                                                                                                                                                                      | a plurality of emitters configured to emit light in a <b>first shape</b> ;                                                                                                                                                                                                                                                                                                                         | one or more emitters configured to emit light in an <b>initial light pattern</b> ;                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1[B]   | a <b>material configured to be positioned</b> between the plurality of light-emitting diodes and tissue on a wrist of a user when the physiological monitoring device is in use, the material configured to <b>change the first shape into a second shape</b> by which the light emitted from one or more of the plurality of light-emitting diodes is <b>projected towards the tissue</b> ; | a <b>material positioned</b> 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 <b>change the first shape into a second shape</b> by which the light emitted from one or more of the plurality of emitters is <b>projected towards a surface of the tissue measurement site</b> ; | an <b>optical transmission material configured to be positioned</b> between the one or more emitters and a tissue measurement site, wherein the optical transmission material is configured to <b>alter a direction of at least a portion of the light emitted from the one or more emitters to shape an output light pattern</b> by which the emitted light is <b>directed toward a surface</b> of the tissue measurement site, wherein <b>the output light pattern comprises a different geometric shape than the initial light pattern</b> ; |
| 1[C]   | a plurality of <b>photodiodes</b> configured to detect at least a portion of the light after the at least the portion of the light passes through the tissue, the plurality of photodiodes further configured to output at least one signal responsive to the detected light;                                                                                                                | a plurality of <b>detectors</b> configured to detect at least a portion of the light after passing through tissue, the plurality of detectors further configured to output at least one signal responsive to the detected light;                                                                                                                                                                   | a plurality of <b>detectors</b> configured to detect at least a portion of the light after passing through tissue, the plurality of detectors further configured to output at least one signal responsive to the detected light;                                                                                                                                                                                                                                                                                                                |
| 1[D]   | a surface comprising a dark-colored coating, the                                                                                                                                                                                                                                                                                                                                             | a surface comprising a dark-colored coating, the                                                                                                                                                                                                                                                                                                                                                   | <i>[elements D and E are switched as compared to</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|      |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | surface configured to be positioned between the plurality of photodiodes 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; | 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; | <i>the '745 and '159]</i><br>a light block configured to prevent at least a portion of the light emitted from the one or more emitters from reaching the plurality of detectors without first reaching the tissue;                                                                                                                                                     |
| 1[E] | a light block configured to prevent at least a portion of the light emitted from the plurality of light-emitting diodes from reaching the plurality of photodiodes without first reaching the tissue; and                                                                                                    | a light block configured to prevent at least a portion of the light emitted from the plurality of emitters from reaching the plurality of detectors without first reaching the tissue; and                                                                                                | <i>[elements D and E are switched as compared to the '745 and '159]</i><br>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; and |
| 1[F] | a processor configured to receive and process <b>the outputted at least one signal</b> and determine a physiological parameter of the user responsive to the outputted at least one signal.                                                                                                                  | a processor configured to receive and process <b>one or more signals responsive to the at least one outputted signal</b> and determine a physiological parameter of the user responsive to the one or more signals.                                                                       | a processor configured to receive and process <b>one or more signals responsive to the outputted at least one signal</b> and determine a physiological parameter of a user responsive to the one or more signals.                                                                                                                                                      |

145. The ITC issued a final initial determination where it found the accused Apple Watch products<sup>179</sup> did not infringe the asserted claims of the '745 Patent—claims 9, 18, and 27.<sup>180</sup>

<sup>179</sup> Those products were the Apple Watch Series 6 and Series 7. Other Apple Watch products with the Blood Oxygen feature, e.g., the Series 8-9, Ultra, and Ultra 2, had not been released at the time of the ITC trial.

<sup>180</sup> *Certain Light-Based Physiological Measurement Devices and Components Thereof*, ITC Inv. No. 337-TA-1276, Final Initial Determination, Doc. ID 787653 at 180-197, 336 (Jan. 10, 2023).

The Commission reviewed this final initial determination (“Final ID”) and “determined to affirm the Final ID without modification, thus adopting the Final ID’s analysis.”<sup>181</sup>

**D. Response to Dr. Madisetti and Dr. Zavislan’s Incorrect Characterization of the ’743 and ’159 Patents**

146. Dr. Madisetti and Dr. Zavislan overstate the claimed “invention” of the ’743 and ’159 patents. As explained in the Sarrafzadeh Opening Report, there is nothing new or inventive about any of the individual elements of the claims, nor the way they are combined.

147. Both Dr. Madisetti and Dr. Zavislan emphasize three purportedly inventive features of the ’743 and ’159 patents: (1) an optical transmission material or material that is configured to change the shape of light, (2) a light block, and (3) a surface comprising a dark-colored coating.<sup>182</sup> Dr. Madisetti suggests that the “novel combination” of these features provides “improved accuracy and ability to measure difficult physiological parameters, such as oxygen saturation at the wrist.”<sup>183</sup> However, Dr. Madisetti and Dr. Zavislan greatly overstate the claimed inventive features of the ’743 and ’159 patent—every feature of the Asserted Claims was well-known long before the alleged 2015 priority date.<sup>184</sup>

148. For instance, Mr. Al-Ali and several inventors of other Masimo asserted patents with much earlier priority dates confirmed that they did not invent pulse oximetry or pulse oximeters, and thus these technologies were known in the art for the ’743 and ’159 Patents.<sup>185</sup> These Masimo inventors allegedly invented the ’223 Patent, a patent which claims a priority date

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<sup>181</sup> *Certain Light-Based Physiological Measurement Devices and Components Thereof*, ITC Inv. No. 337-TA-1276, Commission Opinion, Doc. ID 807050 at 66 (Oct. 27, 2023).

<sup>182</sup> Madisetti Report, ¶¶ 69-72; Zavislan Report, ¶ 46.

<sup>183</sup> See, e.g., Madisetti Report, ¶¶ 69-72.

<sup>184</sup> See Sarrafzadeh Opening Report, Section VI.

<sup>185</sup> See, e.g., Al-Ali Dep. Tr. at 249:25-250:7; Diab Dep. Tr. at 92:18-93:16; Fishel Dep. Tr. at 50:10-51:4; Kiani Dep. Tr. at 369:2-5; Olsen Dep. Tr. at 84:22; Wu Dep. Tr. at 30:15-31:3.





























































226. For example, whereas the Supereyes camera is capable of obtaining a maximum display speed of 30 frames per second (FPS),<sup>249</sup> it is unlikely that a user could obtain 10 FPS in full resolution with a Raspberry Pi HQ Camera. For instance, the following post in the Raspberry Pi forum indicates that one user was unable to obtain more than 1.5 FPS when using the camera:

I used both picamera lib and raspistill to capture full resolution (4056 x 3040) of HQ camera, but I couldn't get more than 1.5 fps. When I use the raspistill command, most of the frames skip. FYI, I set my video memory split to 512MB and I'm using raspberry pi 4.<sup>250</sup>

227. Being able to capture a high FPS is particularly important for capturing the shape of light emitted by the LEDs in the Accused Products. FPS involves the frequency at which consecutive images are captured and displayed. In general, the higher the FPS, the smoother the image captured and the more that image will reflect the actual shape of light.

228. Therefore, Dr. Zavislan's images are unreliable.

**d. Dr. Zavislan's Spatial Irradiance And Spatial Radiance Images Are Inconsistent With The Laws Of Physics**

229. Dr. Zavislan's spatial irradiance and spatial radiance test results are unreliable because the resulting images are inconsistent with the laws of physics. As I explain elsewhere in this report, the laws of physics dictate that, while light is generally square at the LED surface, it quickly diffuses into a conical shape with a circular cross-section due to Lambertian emission before reaching [REDACTED] and, moreover, [REDACTED]

[REDACTED]

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<sup>249</sup> *Supereyes B011 5.0MP X Interchangeable Lens Handheld Digital Microscope Loupe Magnifier*, AMAZON, <https://www.amazon.com/Supereyes-Magnification-Interchangeable-Handheld-B011/dp/B00ZOI54RW>.

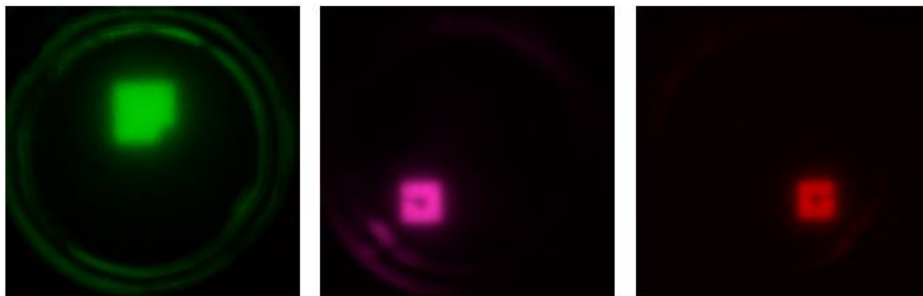
<sup>250</sup> <https://forums.raspberrypi.com/viewtopic.php?t=284909>.

230. Yet, Dr. Zavislan's tests provide contrary results. Namely, regarding the series of images below, he concludes, "when [REDACTED] not present, the shape of light remains [the same as the shape at the LED surface] through the location of the top of [REDACTED]"<sup>251</sup> This is, to put it bluntly, impossible, which further indicates that Dr. Zavislan's testing is flawed and unreliable.

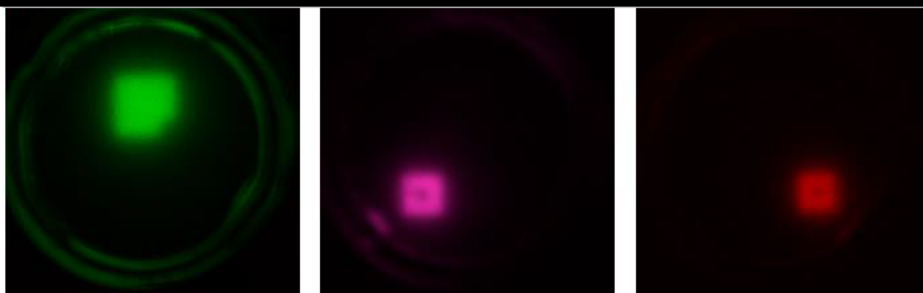
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<sup>251</sup> Zavislan Report, ¶ 154.

2 mm rod with a ground glass surface (9um) placed above LED wirebond



2 mm rod with a ground glass surface (9um) placed level with top of optical barrier



231. Indeed, a closer inspection of these images provides some clues as to why Dr. Zavislan's images and analyses fail to match physical reality. For example, in the image of light from the green LED below, one can observe green shadows, meaning that some, but not all, of the

























































































































































































































































































































































































































**b. The Accused Products Do Not Meet The “Configured To . . . Shape An Output Light Pattern” Limitation Under The Doctrine Of Equivalents**

458. As discussed above in Section XII.A.1.b, [REDACTED] of the Accused Products does not meet Masimo’s theory of infringement based on the doctrine of equivalents at least because 1) Masimo’s doctrine of equivalents theory would vitiate the claim limitation at issue, 2) the alleged equivalents do not perform substantially the same function in substantially the same way to achieve substantially the same result, and 3) Masimo disclaimed these equivalents during prosecution of related patents.

459. For at least these and the reasons described above, the Accused Products do not meet the “configured to . . . shape an output light pattern” limitation under the doctrine of equivalents.

**3. The [REDACTED] of the Accused Products Does Not Include An “Opening Defined In The Dark-Colored Coating”; The [REDACTED]**

460. All asserted claims require an “opening defined in the dark-colored coating.” Both independent claims 1 and 14 require “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.”

461. I disagree with Dr. Zavislan’s and Dr. Madisetti’s opinions that the Accused Products meet the “opening defined in the dark-colored coating” limitation. Based on my analysis, I conclude that the Accused Products do not meet this limitation.

**a. The Accused Products Do Not Literally Meet The “Opening Defined In The Dark-Colored Coating” Limitation**

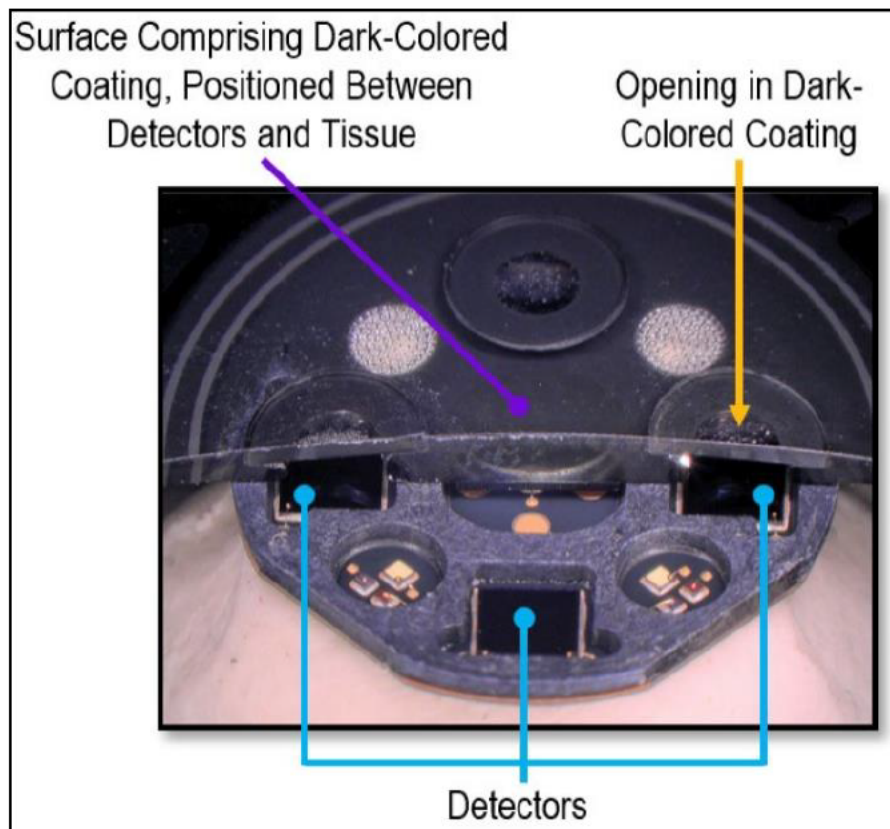
462. Dr. Madisetti and Dr. Zavislan fail to demonstrate that the [REDACTED] of the Accused Products literally meets the “an opening defined in the dark-colored coating” limitation.

[REDACTED]

[REDACTED]

463. As an [REDACTED] matter, Dr. Madisetti and Dr. Zavislan’s respective identifications of “an opening defined in the dark-colored coating” are inconsistent and contradict one another. Dr. Madisetti alleges that this limitation is met by the [REDACTED]

[REDACTED].<sup>404</sup>



<sup>404</sup> Madisetti Rpt. at Ex. A, A-49–A-59; Madisetti Rpt. Ex. B at B-44–B-53.

\_\_\_\_\_

\_\_\_\_\_



, [REDACTED]

\_\_\_\_\_

\_\_\_\_\_

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<sup>406</sup> See, e.g., Joint Claim Construction Brief Regarding Masimo Asserted Patents (08/31/2023) Apple Ex. 24 (defining “opening” as “2 An open space serving as a passage or gap”); *id.*, Apple Ex. 30 (defining “opening” as “2 a vacant or unobstructed space, esp. one that will serve as a passageway; gap”); *id.*, Apple Ex. 31 (defining “opening” as “1 an open place; hole; gap”).

<sup>407</sup> Indeed, I understand that the Accused Products are waterproof.

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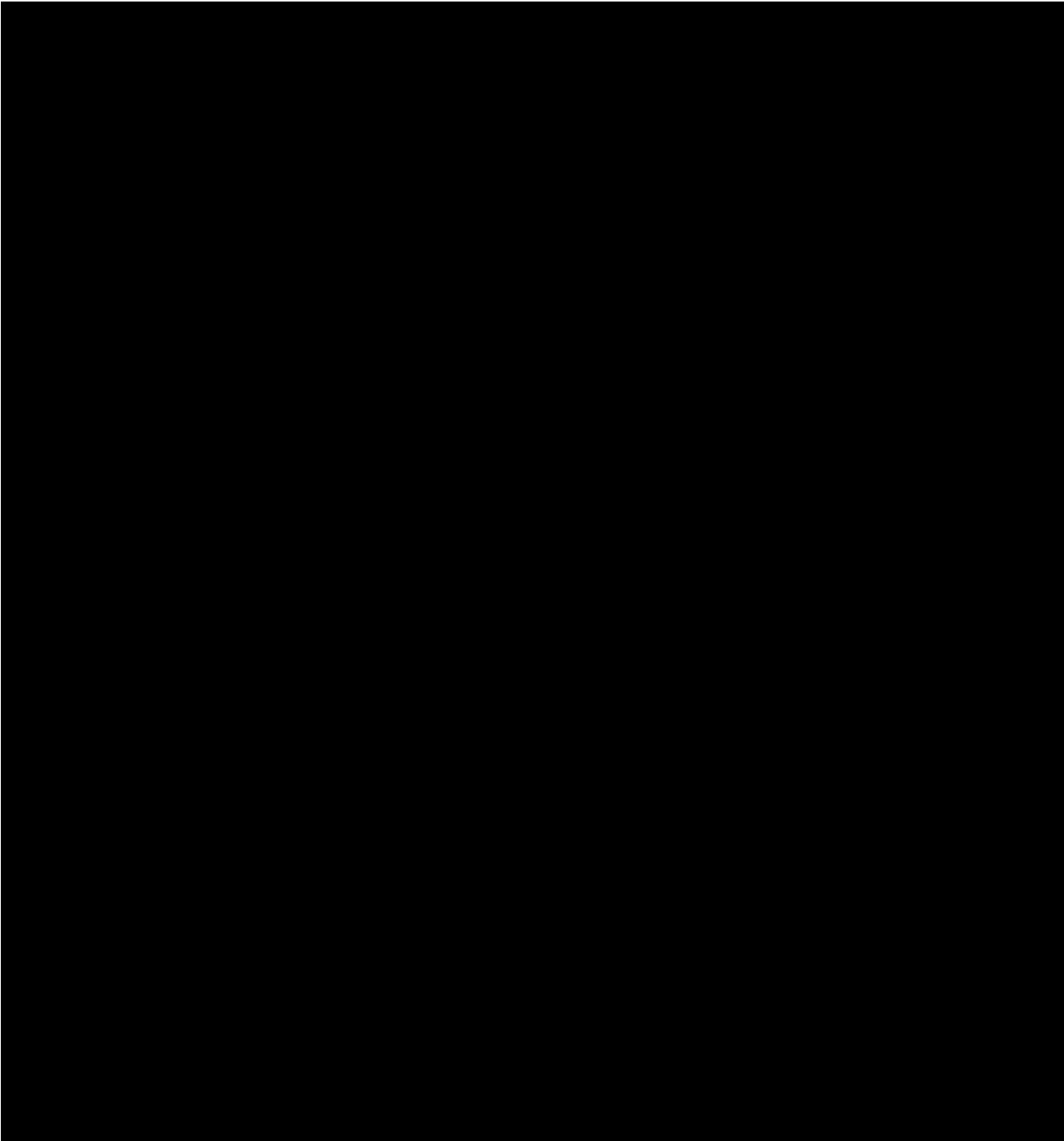
\_\_\_\_\_

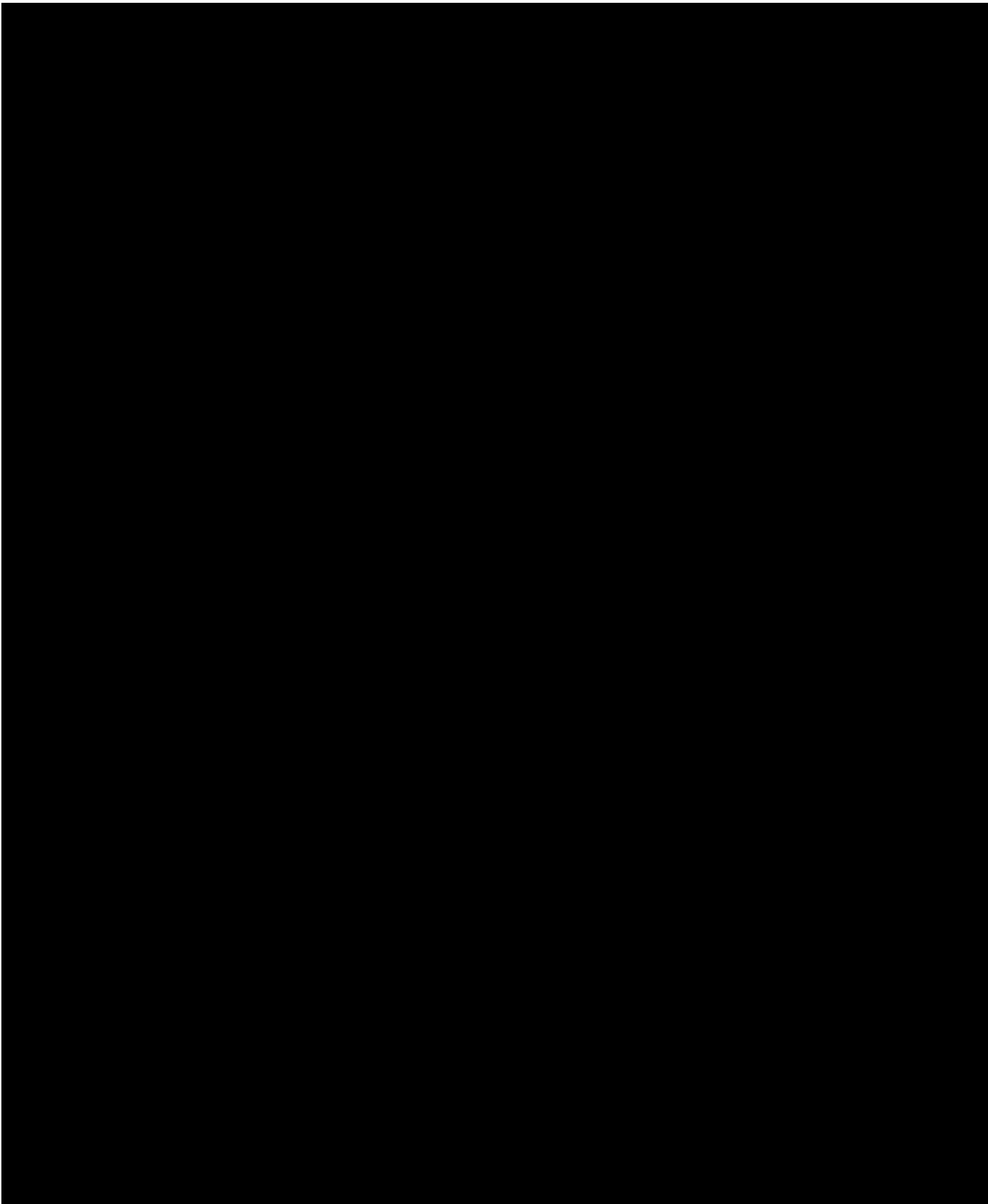
408 APL MAS ITC 00346267.

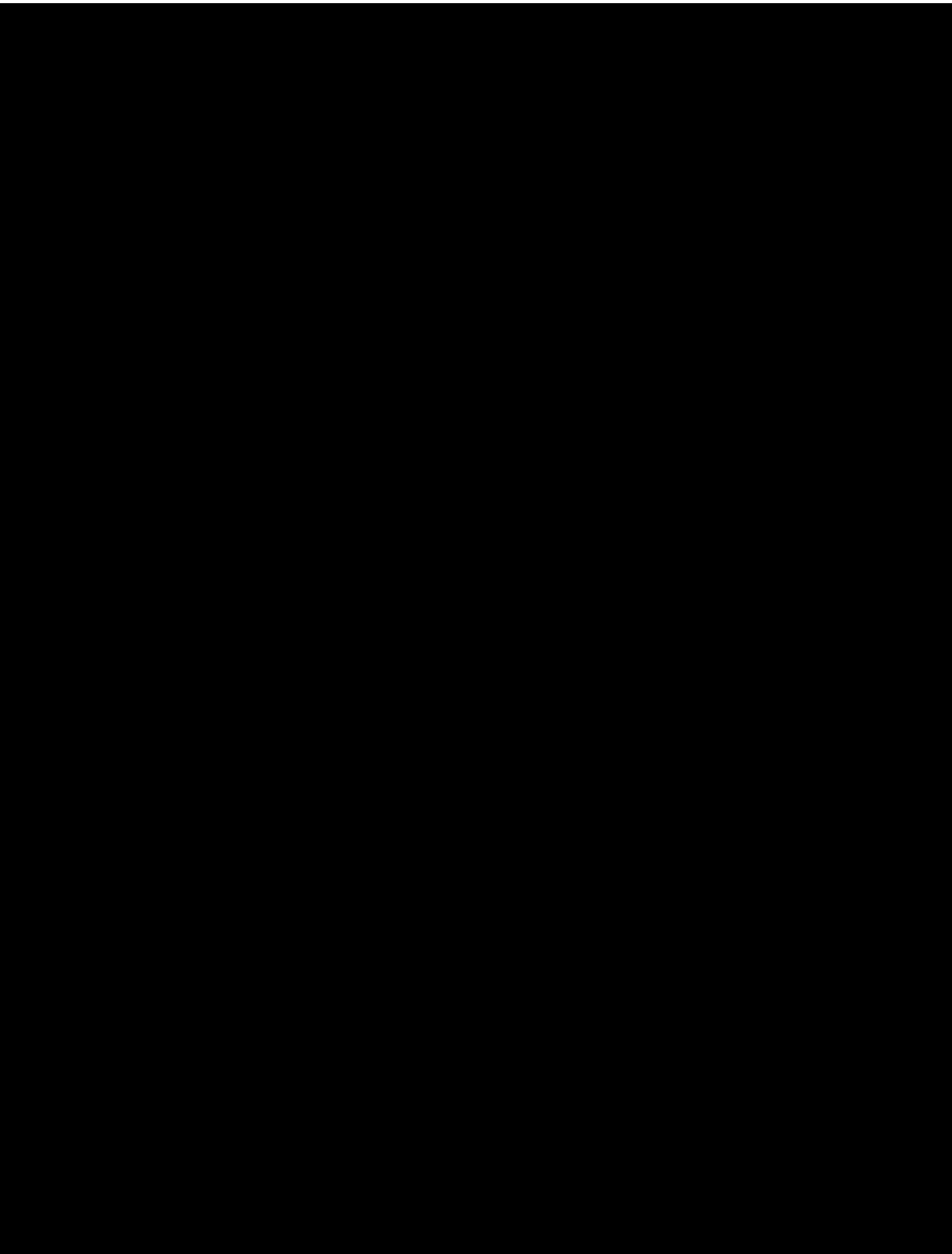
<sup>409</sup> Block Dep. Tr. at 52:10-15.

<sup>410</sup> Mannheimer ITC Dep. Tr. at 186:19-22; *see also id.* at 185:10-186:16.

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469. Accordingly, Dr. Madisetti and Dr. Zavislan fail to demonstrate that the Accused Products meet the limitation of “an opening defined in the dark-colored coating.”

**b. The Accused Products Do Not Meet The “Opening Defined In The Dark-Colored Coating” Limitation Under The Doctrine Of Equivalents**

470. The Accused Products also do not meet the limitation of “an opening defined in the dark-colored coating” under the doctrine of equivalents either. Dr. Madisetti asserts that [REDACTED]

[REDACTED]<sup>412</sup>

Under the construction apparent in Apple’s Final Noninfringement Contentions, the identified “opening” is an “opening” under the doctrine of equivalents because it has substantially the same function, operates in substantially the same way, and achieves substantially the same result as an empty space. [REDACTED]

[REDACTED]<sup>413</sup>

471. I disagree. Masimo’s doctrine of equivalents theory fails for at least three reasons:

(i) Masimo’s doctrine of equivalents theory would ensnare prior art, (ii) Masimo’s doctrine of equivalents theory vitiates “opening” from the claim limitation, and (iii) there are more than insubstantial differences between the claim limitation at issue and Dr. Zavislan’s alleged “equivalent.”<sup>414</sup>

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<sup>412</sup> Madisetti Op. Report Ex. A at 58; Ex. B at 52–53.

<sup>413</sup> Madisetti Op. Report Ex. A at 58; Ex. B at 52–53.

<sup>414</sup> Dr. Zavislan does not present any theory of infringement under the doctrine of limitations with respect to this limitation.

**i. Masimo's Doctrine of Equivalents Theory Would Ensnare Prior Art**

472. The Accused Products do not meet the "opening" limitation under the doctrine of equivalents at least because Masimo's doctrine of equivalents theory would ensnare multiple prior art references.

473. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

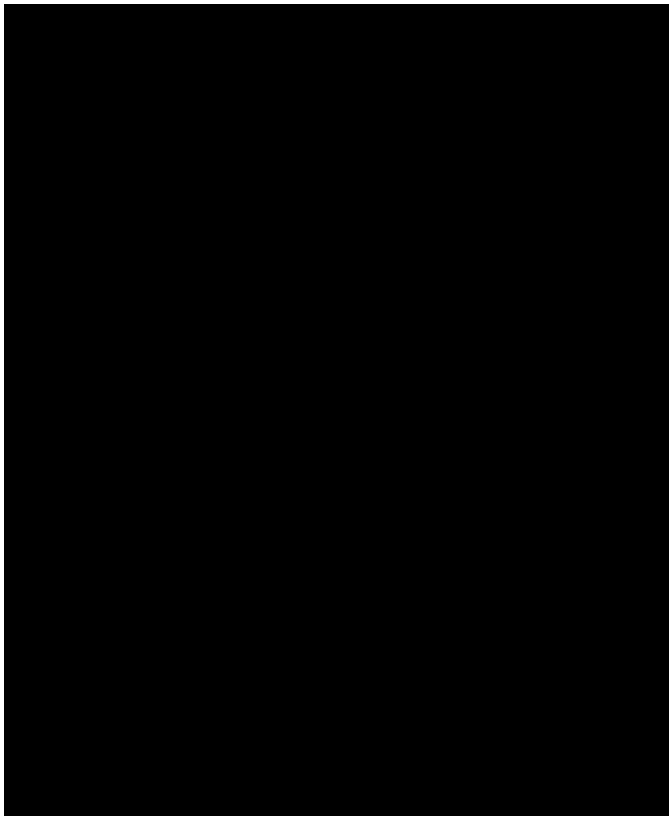
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<sup>415</sup> See Section VII.A. above.

<sup>416</sup> APL-MAS\_00127516 at APL-MAS\_00127528.

<sup>417</sup> See *e.g.*, APL\_MAS\_ITC\_00313254 at APL\_MAS\_ITC\_00313259; APL\_MAS\_ITC\_01187128 at APL\_MAS\_ITC\_01187136.

<sup>418</sup> APL\_DEL04011011.



474.

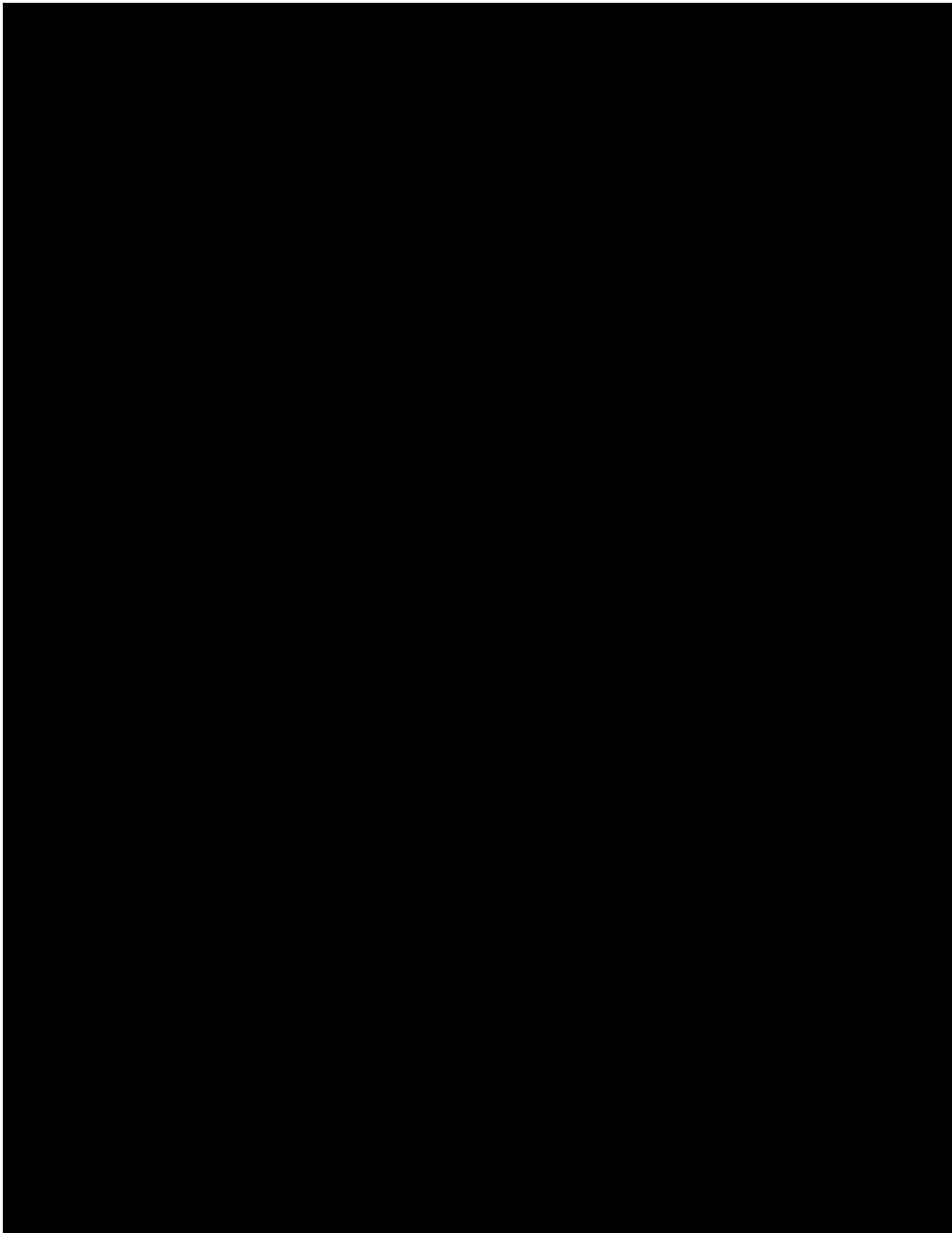
[REDACTED]

[REDACTED]

[REDACTED]

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<sup>419</sup> APL-MAS\_00127516 at APL-MAS\_00127528.



475. [REDACTED]

[REDACTED]

[REDACTED]

476. Second, as another example, U.S. Patent No. 8,998,815 (“Venkatraman”), which was filed on June 3, 2014 and issued on April 7, 2015,<sup>420</sup> discloses a window that permits light reflected from a user’s tissue to reach one or more photodiodes:

The biometric monitoring device, in some embodiments, may include a window (for example, a window that is, to casual inspection, opaque) in the housing to facilitate optical transmission between the optical sensors and the user. *Here, the window may permit light (for example, of a selected wavelength) to be emitted by, for example, one or more LEDs, onto the skin of the user and a response or reflection of that light to pass back through the window to be sampled, measured, and/or detected by, for example, one or more photodiodes.*<sup>421</sup>

477. Masimo cannot assert that a window and/or lens is equivalent to an “opening” for purposes of the doctrine of equivalents as this would ensnare the prior art disclosures of the Venkatraman.

**ii. Masimo’s Doctrine Of Equivalents Theory Vitiates The Claim Requirement Of An “Opening”**

478. The Accused Products do not meet the “opening” limitation under the doctrine of equivalents at least because Masimo’s doctrine of equivalents theory would vitiate the claim requirement of an “opening.”

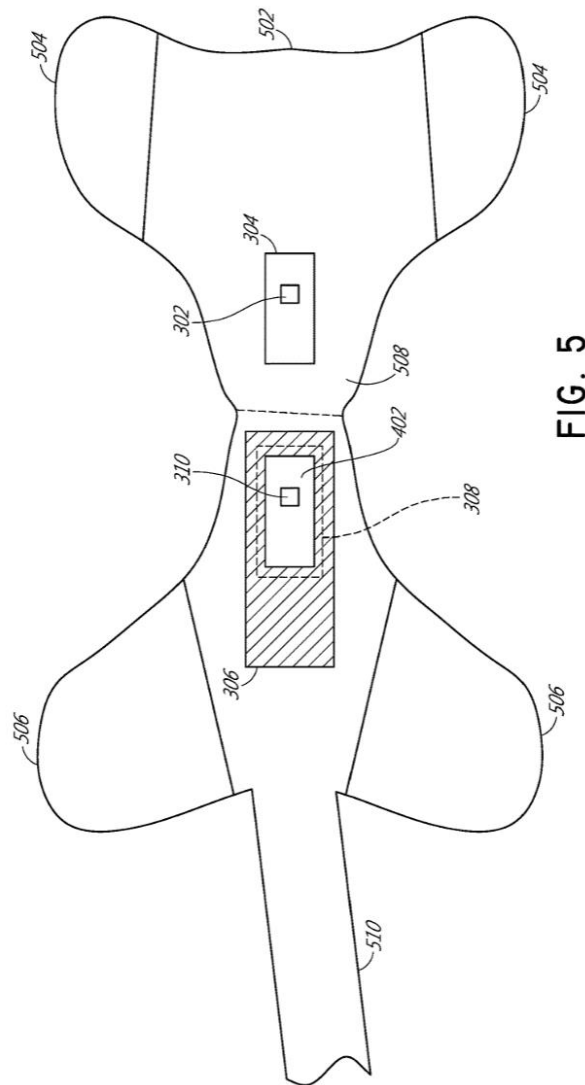
479. The ’743 Patent specifically requires an “opening defined in the dark-colored coating” which is “configured to allow at least a portion of light reflected from the tissue to pass through the surface.” As discussed above, the ordinary meaning of “opening” is “empty space.” Material, such as closed windows and solid lenses, are the opposite of an “opening.” Stretching the claim term “opening” to encompass a closed window as an equivalent would vitiate the requirement of an “opening.”

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<sup>420</sup> U.S. Patent No. 8,998,815 (“Venkatraman”), APL\_DEL00030616, at (22), (45).

<sup>421</sup> *Id.* at 33:56-65.

480. In addition to the language of the claims, the specification and figures of the '743 Patent make clear that an opening is not merely a clear portion of material. For example, the '743 Patent indicates the light-absorbing detector filter of an embodiment by shading the corresponding box, as shown below. The “opening,” in contrast, does not have any shading to indicate any material in the opening.<sup>422</sup>



481. The specification of the '743 Patent supports that an “opening” is the absence of any material. For example, the '743 Patent provides an exemplary list of material for components

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<sup>422</sup> '743 Patent at Figure 5; *see also* '159 patent at Figure 5.

of the invention which are comprised of material(s). The “light blocker” and “cover” may be comprised of “any material that optically isolates the light concentrator 708 and the detector 710.”<sup>423</sup> Additionally, regarding the diffuser, “[e]xamples of materials that can be used to realize the light diffuser 304 include, without limitation, a white surface, glass, ground glass, glass beads, polytetrafluoroethylene (also known as Teflon®), opal glass, and greyed glass, to name a few.”<sup>424</sup> The light-absorbing material “can be a black opaque material or coating or any other dark color or coating.”<sup>425</sup> In contrast, the ’743 Patent provides no examples of any material for the “opening,” nor does it even provide any indication that the “opening” is comprised of any material.

482. To put it simply, an opening is an empty space. Especially in the field of optics, light traveling through space in an opening is not equivalent to light traveling through a material, such as a window.

**iii. Masimo’s Proposed Equivalent Does Not Satisfy The Function/Way/Result Test And Is Not Merely Insubstantial Different From The Claimed “Opening”**

483. The Accused Products do not meet the “opening” limitation” under the doctrine of equivalents at least because Masimo’s proposed equivalent does not meet the function/way/result test and is not merely insubstantially different from the claimed “opening.”

484. I disagree with Dr. Madisetti’s opinion that [REDACTED] [REDACTED] “has substantially the same function, operates in substantially the same way, and achieves substantially the same result as an empty space.”<sup>426</sup>

485. [REDACTED]

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<sup>423</sup> ’743 patent at 11:14-17; *see also* ’159 patent at 11:14-17.

<sup>424</sup> *Id.* at 7:49-53; *see also* ’159 patent at 7:49-53.

<sup>425</sup> *Id.* at 9:34-36; *see also* ’159 patent at 9:34-36.

<sup>426</sup> Madisetti Opening Report Ex. A at 58, Ex. B. at 52.

[REDACTED]

486. Second, light propagates differently while traveling through material, such as [REDACTED] than it does while traveling through empty spaces. As one example, light travels slower through glass than it does through air. [REDACTED]

[REDACTED]

[REDACTED] The higher the refractive index of a material the slower light travels through it. [REDACTED]

[REDACTED]

<sup>427</sup> Indeed, I understand that the Accused Products are waterproof.

487. Dr. Zavislan and I agree that light behaves differently traveling through material than traveling through air.<sup>428</sup> For example, he opines that material such as glass “effects the propagation of light” and will “displace the final image.”<sup>429</sup> [REDACTED]

[REDACTED]

488. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

B. [REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

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<sup>428</sup> Zavislan Opening Report ¶ 58.

<sup>429</sup> Zavislan Opening Report ¶ 58.

<sup>430</sup> See Madisetti Opening Report, ¶ 92; Zavislan Opening Report, ¶¶ 40-42.

**C. Apple Does Not Willfully Infringe The '743 Patent**

508. Dr. Madisetti and Dr. Zavislan do not assert that Apple willfully infringes the '743 Patent. I agree that Apple does not willfully infringe.

509. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

510. [REDACTED]

[REDACTED]

[REDACTED]

**XIII. APPLE DOES NOT INFRINGE THE '159 PATENT**

**A. Apple Does Not Directly Infringe Any Asserted Claims Of The '159 Patent**

511. I disagree with Dr. Madisetti and Dr. Zavislan's opinions that the Accused Products directly infringe claims 1, 7, 8, 19, and 22 of the '159 patent.<sup>445</sup> In my opinion, the Accused Products do not directly infringe all claim limitations of any asserted claim of the '159 patent, either literally or under the doctrine of equivalents.<sup>446</sup>

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<sup>442</sup> See Section V.F.

<sup>443</sup> See Section XII.B.1.a.

<sup>444</sup> See Section XII.A and Section XII.B.

<sup>445</sup> The evidence identified in my noninfringement analysis for these claims is exemplary. To support my noninfringement analysis, I reserve the right to rely on, and will rely on, evidence cited in my noninfringement analysis for the '743 patent and in the remainder of my Report, all of which is incorporated by reference herein.

<sup>446</sup> Claims 7 and 8 both depend from claim 1. Claim 22 depends from claim 19.

**1. Apple Does Not Infringe The Asserted Claims Of The '159 Patent For The Reasons Discussed Above With Respect To The '743 Patent**

512. In my opinion, Apple does not infringe the Asserted Claims of the '159 patent for the same reasons discussed above with respect to the '743 patent.

513. First, for the same reasons discussed above with respect to the '743 patent, the [REDACTED] in the Accused Products is not a “material configured to change the first shape [of light] into a second shape,” as required by all Asserted Claims of the '159 patent, either literally or under the doctrine of equivalents.<sup>447</sup> Specific to the “first shape,” the Asserted Claims of the '159 patent also require a “plurality of emitters configured to emit light in a *first shape*.”

514. On one hand, if the plurality of emitters in the Accused Products emit light [REDACTED] [REDACTED] then [REDACTED] does not receive the first shape, let alone change [REDACTED] [REDACTED] into a second shape. Specifically, as described throughout this report, [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

515. On the other hand, if the plurality of emitters in the Accused Products emit light in [REDACTED], then [REDACTED] does not change that [REDACTED] into a second shape. [REDACTED] [REDACTED]

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<sup>447</sup> Regarding the doctrine of equivalents allegations for this claim limitation, my analysis is also the same as discussed above for the '743 patent. However, while the prosecution histories of both the '743 and '159 patents involved the applicant amending claims to reflect the requirement for a change in the shape of light *beyond a change in size*, the relevant amendment during prosecution of the '159 patent is found in the March 9, 2020 Examiner's Amendment that occurred after a February 12/13, 2020 Examiner Interview during prosecution of the '159 patent. This Amendment and Interview are described in Section VIII of my Opening Report.

