

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

**SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC.,
FOSSIL GROUP, INC.,
FOSSIL STORES I, INC.,
FOSSIL PARTNERS, L.P.,
OURA HEALTH OY, AND
ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.**

Petitioners,

v.

OMNI MEDSCI, INC.,

Patent Owner.

Case IPR2025-01251
Patent No. 10,874,304

PETITIONERS' REPLY TO PATENT OWNER'S RESPONSE

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1027	U.S. Patent No. 8,108,036 (“Tran”)
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TABLE OF ABBREVIATIONS

Abbreviation	DESCRIPTION
'304	U.S. Patent No. 10,874,304 (Ex. 1001)
Claims / Challenged Claims	Claims 1-6, 11-16, 19-22, 26-27 of the '304
IPR	<i>Inter Partes</i> Review
Petitioners	Petitioners Samsung Electronics Co. Ltd., Samsung Electronics America Inc., Fossil Group, Inc., Fossil Stores I, Inc., Fossil Partners, L.P., Oura Health Oy, and OnePlus Technology (Shenzhen) Co., Ltd.
PO	Patent Owner Omni MedSci, Inc.
POSITA	Person of Ordinary Skill in the Art
Board	Patent Trial and Appeal Board
EDTX	Eastern District of Texas
Pet.	<i>Samsung Electronics Co., Ltd. et al. v. Omni MedSci, Inc.</i> , No. IPR2025-01251, Pap. 1 (PTAB Aug. 5, 2025)
POR	<i>Samsung Electronics Co., Ltd. et al. v. Omni MedSci, Inc.</i> , No. IPR2025-01251, Pap. 28 (PTAB May 7, 2026)
'533	U.S. Patent No. 9,651,533 (Ex. 1081)
'484	U.S. Patent No. 10,517,484 (Ex. 1082)
'533-FWD	<i>Apple Inc. v. Omni Medsci, Inc.</i> , No. IPR2019-00916, Pap. 39 (PTAB Oct. 14, 2020) (Ex. 1008)
'484-FWD	<i>Apple Inc. v. Omni Medsci, Inc.</i> , No. IPR2021-00453, Pap. 22 (PTAB Aug. 3, 2022) (Ex. 1015)

Abbreviation	DESCRIPTION
'484-RFWD	<i>Apple Inc. v. Omni Medsci, Inc.</i> , No. IPR2021-00453, Pap. 26 (P.T.A.B. Feb. 14, 2025) (Ex. 1016)
Prior FWDs	'533-FWD, '484-FWD, and '484-RFWD (Exs. 1008 & 1015-1016)
Prior IPRs	<i>Apple Inc. v. Omni Medsci, Inc.</i> , No. IPR2019-00916 (PTAB) and <i>Apple Inc. v. Omni Medsci, Inc.</i> , No. IPR2021-00453 (PTAB)
Texas Case	<i>Omni MedSci, Inc. v. Samsung Electronics Co., Ltd. et al.</i> , No. 2:24-cv-01070-JRG-RSP (E.D. Tex.)
Related EDTX Cases	<i>Omni MedSci, Inc. v. Apple Inc.</i> , 2:18-cv-00134-RWS (E.D. Tex.) <i>Omni MedSci, Inc. v. Apple Inc.</i> , 2:18-cv-00429-RWS (E.D. Tex.)
Lisogurski	U.S. Patent No. 9,241,676 (Ex. 1025)
LeBoeuf	U.S. Patent Pub. No. 2010/0217102 (Ex. 1026)
Tran	U.S. Patent No. US 8,108,036 (Ex. 1027)
Carlson	U.S. Patent Pub. No. 2005/0049468 (Ex. 1028)
Marbach	U.S. Patent No. 7,139,076 (Ex. 1029)
SEC	Samsung Electronics Co., Ltd.
SEA	Samsung Electronica America, Inc.
SSI	Samsung Semiconductor, Inc.
SDS	Samsung SDS Co., Ltd.

I. INTRODUCTION

PO has disclaimed claims 1-3, 11, 14, 19-20, 25, and 27. Ex.2038; Ex.2042. Claims 4-6, 12-13, 15-16, 21-22, and 26 (“Claims”) thus remain in this proceeding, each of which is rendered obvious by the Grounds. Collateral estoppel still applies to the vast majority of the limitations here, given previous Board decisions finding identical or substantially identical claim limitations unpatentable.

The Patent Owner Response (“POR”) challenges limited issues:

(1) whether Lisogurski in view of LeBoeuf renders obvious the semiconductor sources and detectors in arcs (claims 4-6, 15-16, 21-22) (Ground 2);

(2) whether Lisogurski discloses and renders obvious “identification of an object” (claims 12-13, 26) (Grounds 3-4);

(3) whether Lisogurski discloses and renders obvious “improv[ing] a signal-to-noise ratio” (“SNR”) of the “selection or identification of an object” (claims 12-13, 26) (Grounds 3-4); and

(4) whether Lisogurski in view of LeBoeuf, Tran, and Marbach renders obvious “applying...multivariate techniques” to improve SNR (claims 12-13, 26) (Grounds 9-10).

Patent Owner (“PO”), however, relies on mischaracterizations of the Petition, prior art, law, and the Claims themselves. The Claims are unpatentable and PO’s reliance on alleged secondary considerations is misplaced.

II. CLAIM CONSTRUCTION

PO admits that the Petition applies the Board’s prior construction of “identification of an object” (i.e., “to recognize or establish an object as being a particular thing”) affirmed by the Federal Circuit, and agrees that this construction should apply here. POR, 12-13. Under that construction, and as detailed in the Petition, the prior art discloses and renders obvious the “identification of an object” term. No other claim construction is necessary, and PO does not disagree. Pet., 15. The prior art discloses the Claims’ indisputable scope.¹ Anthony-Reply, ¶¶8-12.

III. COLLATERAL ESTOPPEL

PO tries to avoid collateral estoppel under a misunderstanding of the Petition and the law. PO argues that collateral estoppel does not apply to claims 2, 4-6, 12-16, 21-22, and 26-27 due to their differences with the ’533 and ’484 claims. POR

¹ Petitioners proposed the Board’s prior construction of “modulating”/“modulation” in the Texas case, but the court removed “*to include information*”—broadening the term’s scope. Pet., 15; Ex.1122, 10-14. Regardless, the prior art satisfies the terms under either construction, and PO does not disagree. Pet., 43-45; POR, 15-16. The court also construed the term “beam,” but the Board already declined to do so because it was unnecessary—that remains true here as the term is met regardless, and PO does not disagree. Pet., 15, 24-25; POR, 15-16. Anthony-Reply, ¶¶10-11.

17-19. But, PO has disclaimed claim 14 (Ex.2042) and Petitioners do not assert collateral estoppel for the additional limitations recited in claims 2, 4-6, 15-16, 21-22, and 27. Pet., 16. This leaves only the additional limitations recited in claims 12-13 and 26, to which collateral estoppel attaches at least partially. *Id.*

PO's cherry-picked limitations do not support its efforts to avoid collateral estoppel. PO argues that the prior '533 IPR did not address "increasing the [SNR] by increasing a light intensity relative to an initial light intensity" in the independent claims or "wherein the wearable device is at least in part configured for selection or identification of an object" in claims 9, 12, and 26. POR, 19. However, the Board already found identical or substantially similar limitations disclosed by the prior art. Pet. 16, 25-26, 65-66; '533-FWD, 26, 42-43 (finding Lisogurski discloses "***increase [SNR]*** by ***increasing a light intensity***"); '484-FWD, 27 (finding Lisogurski discloses "***increase the [SNR]*** by ***increasing light intensity*** of at least one of the plurality of semiconductor sources ***from an initial light intensity***"); '484-RFWD, 4-7 (finding Lisogurski discloses "***wherein the wearable device is at least in part configured*** for selection or ***identification of an object***"); *Google LLC v. Hammond Dev. Int'l, Inc.*, 54 F.4th 1377, 1381 (Fed. Cir. 2022) (finding estoppel in IPR where the "only difference between the claims is the language describing the number of application servers"). PO similarly argues against collateral estoppel for the disclaimed independent claims by pointing to an additional limitation ("an output signal

representing...a non-invasive measurement on blood contained within the sample” and “the captured light including...the input optical beam reflected from the tissue”) (POR, 18-19) but, as the Petition explains, the Board already found that the prior art discloses at least portions of those claim elements. ’484-FWD, 43-44 (“measur[ing] the signal ... reflected from the tissue” disclosed in the prior art); ’533-FWD, 37-39, 42-43 (“generate an output signal” disclosed in the prior art); Pet., 28-33, 44. Anthony-Reply, ¶15.

Contrary to PO (POR 19-20), collateral estoppel attaches to individual limitations. *See M2M Sols. LLC v. Amazon.com, Inc.*, No. 2022-1122, 2023 WL 2154964, at *4 (Fed. Cir. Feb. 22, 2023) (estopping plaintiff from arguing against prior art’s teaching of a disputed limitation); *Keysight Techs., Inc. v. Centripetal Networks, LLC*, IPR2023-00446, Paper 30 at 21 (PTAB Aug. 5, 2024) (finding PO “estoppe[d] from asserting that [certain limitations] are not taught or suggested”).

While the ’484-RFWD is on appeal (POR, 16-17), it will become final—and collateral estoppel thus applies—upon “affirmance.” *XY, LLC v. Trans Ova Genetics, L.C.*, 890 F.3d 1282, 1294 (Fed. Cir. 2018). Regardless, the Board’s unpatentability findings regarding substantially the same limitations in the ’484-RFWD apply equally here and there is no reason to “deviate from the Board’s [prior] decision.” Pet., 20; *Vivint, Inc. v. SB IP Holdings LLC*, IPR2022-01364, Paper 18 at 52 n.15 (PTAB Apr. 10, 2024).

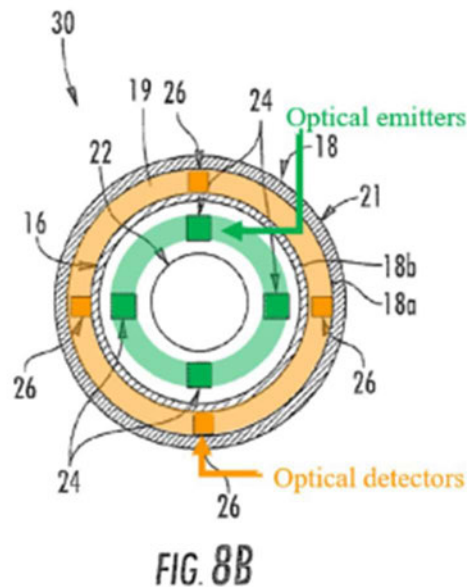
Further, no lack of incentive exception to collateral estoppel applies to the '484-FWD. POR, 21-22. PO was actively asserting infringement of the unpatentable '484 claims against Apple seeking damages and had incentive to appeal '484-FWD. '484-FWD; Exs.1125-1126; *Keysight Techs., Inc. v. Centripetal Networks, LLC*, IPR2022-01535, Paper 26 at 6, 19-22 (PTAB Apr. 16, 2024) (applying collateral estoppel where not all claims were found unpatentable). PO's cited *Oren Techs., LLC v. Proppant Express Invs. LLC* is inapposite—the lack of incentive there came from a stipulated judgment of non-infringement in the district court. No. 2019-1778, 2021 WL 3120819, at *3 (Fed. Cir. July 23, 2021). *Power Integrations, Inc. v. Semiconductor Components Indus., LLC* is also inapposite—there, the patentee did not have an incentive to appeal IPR unpatentability findings because those claims were found not infringed. 926 F.3d 1306, 1313 n.4, n.6 (Fed. Cir. 2019) (emphasizing the decision has no bearing on “IPR decisions in circumstances different than” that case).

IV. LISOGURSKI DISCLOSES AND RENDERS OBVIOUS CLAIMS 1, 3, 11, 19, 20

PO has disclaimed all claims challenged in Ground 1. Lisogurski nonetheless anticipates and renders obvious all limitations of those claims, which are included in the Claims depending therefrom, and PO does not argue otherwise. Pet., 24-49; POR, 22. Anthony-Reply, ¶¶13-15.

V. LISOGURSKI IN VIEW OF LEBOEUF RENDERS OBVIOUS THE ARC LIMITATIONS (CLAIMS 4-6, 15-16, 21-22)²

Lisogurski in view of LeBoeuf renders obvious the arc limitations. LeBeouf discloses optical emitters and detectors spatially separated in concentric arcs. Anthony-Reply, ¶18.



² While acknowledging that claims 2, 14 and 27 have been disclaimed, PO asserts that “Lisogurski and LeBoeuf Do Not Render Obvious the Reflective Surface Limitation.” POR 22-23. PO fails to put forth any argument or support and, as the Petition details, Lisogurski in view of LeBoeuf renders obvious the reflective surface. Pet., 54-57. Anthony-Reply, ¶¶16-17.

LeBoeuf, Fig. 8B; Pet. 49-51, 55-56; Anthony, ¶¶260, 278-279; *see also* Pet. 56-57 (explaining [5]-[6], [15]-[16], and [21]-[22] are met for the same reasons as [4]); Anthony, ¶¶282-289, 294-313. Anthony-Reply, ¶18.

A POSITA would have understood that light emitted into biological tissue undergoes significant scattering and absorption, with the reflected light exiting the tissue at a wide range of angles, and therefore would have been motivated to apply LeBoeuf's emitter/detector arc arrangement teachings to Lisogurski to improve detection of the scattered light and increase the SNR. Pet. 51-52 (citing Lisogurski, 11:16-20; LeBoeuf, ¶105, FIG. 8B.; Anthony, ¶¶262-263); Ex.2045, 195:19-196:6, 198:5-17.³ Anthony-Reply, ¶¶19, 21.

Each of PO's contrary arguments fails. **First**, PO argues no motivation just because Lisogurski and LeBoeuf allegedly do not "disclose or suggest that such an arrangement would lead to increased accuracy or reliability." POR, 25. But, motivation can come from figures, as LeBoeuf's did. *See Nat'l Steel Car, Ltd. v. Canadian Pac. Ry., Ltd.*, 357 F.3d 1319, 1337-38 (Fed. Cir. 2004) (finding

³ Contrary to PO's mischaracterization, Dr. Anthony's testimony is not non-responsive. POR, 23-24, n.2. Instead, consistent with his declaration, Dr. Anthony opined "LeBoeuf teaches an arc arrangement" and that he relies on "the combination of Lisogurski and LeBoeuf." Ex.2045, 161:11-23. Anthony-Reply, ¶20.

motivation from a drawing). LeBoeuf’s Fig. 8B undisputedly shows both LEDs and photodetectors arranged in arcs. And, Dr. Anthony’s testimony—which PO ignores (POR, 23-36)—confirms Fig. 8B provides the motivation PO argues is missing.⁴ Ex.2045, 189:15-20, 191:16-192:8, 193:7-194:20, 195:19-196:6, 203:20-25; Pet. 49-52 (citing Anthony, ¶¶260-263). Motivation may also be found in “the common knowledge.” *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (2006). Indeed, an arc arrangement was well known to “maximize the fraction of backscattered light collected.”⁵ Pet., 51-52 (citing Mendelson, 4:14-65; Anthony, ¶¶262-263). That Lisogurski, LeBoeuf, and Mendelson do not explicitly recite “angle” from the Petition’s motivation to combine

⁴ Petition does not argue that LeBoeuf’s and Lisogurski’s devices being capable of being worn on the body alone provides a motivation to combine—rather, it confirms such a motivation and reasonable expectation of success. Pet. 53; POR, 26-27; Anthony-Reply, ¶22.

⁵ Dr. Anthony did not admit to not reviewing documents cited in Mendelson—regardless, Mendelson itself provides sufficient description of the POSITA knowledge. *Contra* POR, 26 (citing Ex.2045, 198:19-201:12); *see also* Ex.2045, 198:19-199:10 (“I believe I’ve reviewed that document in the past.”). Anthony-Reply, ¶28.

(i.e., capturing reflected lights “at a wide range of angles”) is immaterial. *Contra* POR, 28. Mendelson discusses “backscattered light,” which is light reflected at a wide range of angles. Mendelson, 4:23-35; Pet., 51-52; Anthony, ¶¶262-263. Anthony-Reply, ¶¶23-24.

Second, PO’s efforts to mischaracterize Mendelson to negate the motivation to combine also fail. PO does not disagree that Mendelson provides the motivation to apply LeBoeuf’s arc arrangement teaching for detectors, but argues that Mendelson does not provide the same motivation for LEDs. POR, 26-27. This ignores Mendelson’s teaching where “four R and four IR LEDs are spaced at 90-degree intervals around the substrate and at an equal radial distance from the photodiode,” which expressly discloses LEDs in arc—improving accuracy by increasing the surface area of the subject’s tissue exposed to the emitted light. Mendelson, 4:36-44; Pet. 51-52. Thus, Mendelson teaches LEDs in an arc, in addition to photodetectors placed around LEDs also in an arc arrangement (Pet. 52; Mendelson, 4:14-65), with which PO does not disagree—this is the same configuration in LeBoeuf’s Fig. 8B, confirming the POSITA knowledge reflected in Mendelson that LeBeouf’s arc arrangements improve detection of backscattered light. Pet. 52; Mendelson, 4:14-65; *cf.* POR, 27-29. *Janssen Pharm., Inc. v. Teva Pharm. USA, Inc.*, 97 F.4th 915, 929 (Fed. Cir. 2024) (“a motivation may be found in many different places and forms.”). In view of Lisogurski’s teaching that “[t]he

light intensity may be directly related to the absorbance and/or reflectance of light in the tissue,” a POSITA would thus have been motivated to arrange the LEDs and detectors in arcs to increase the light on an area of interest and improve detection of the scattered reflected light, as disclosed in LeBoeuf. Anthony, ¶¶262-263 (citing Lisogurski, 11:16-20); Pet. 51-52. Anthony-Reply, ¶¶25-27.

Additionally, rather than assuming that there are only linear and arc arrangements (POR, 26-27 (citing *Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886-87 (Fed. Cir. 2024))), Petitioners detailed why a POSITA would have been motivated to apply LeBoeuf’s arc arrangement teachings to Lisogurski. Pet., 51-52; *Slingshot Printing LLC v. Canon U.S.A., Inc.*, No. 2024-1956, 2026 WL 1098251, at *3 (Fed. Cir. Apr. 23, 2026) (declining to apply *Virtek* when the petitioner demonstrated known design needs and market pressures). The correct inquiry is “whether a [POSITA] would have been motivated to combine the prior art to achieve the claimed invention” (*DyStar*, 464 F.3d at 1360) and for there to “be *some* articulated reasoning with *some* rational underpinning.” *Alza Corp. v. Mylan Laboratories, Inc.*, 464 F.3d 1286, 1291 (2006); see *In re Fulton*, 391 F.3d 1195 (Fed. Cir. 2004) (dismissing appellant’s argument that “the Board failed to demonstrate that the characteristics disclosed ... are preferred over other alternatives”). The Petition explains that a POSITA would have specifically recognized the benefits of the arc arrangements, providing sufficient motivation to

apply LeBoeuf's arc arrangements teaching to Lisogurski. Pet., 51-52. Anthony-Reply, ¶¶29-30.

Third, LeBoeuf's other components do not negate the motivation to apply LeBoeuf's LED and detector arc arrangements teaching to Lisogurski. Petitioners do not argue physically inserting LeBoeuf's earbud into Lisogurski's sensor. Pet., 51-52, 55-56; *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (“[A] determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.”); POR, 31-33. LeBoeuf's geometry, or that LeBoeuf's other embodiments provide different configurations (POR, 30-31), does not negate the motivation to apply LeBoeuf's LED/detector arc arrangements teaching to Lisogurski. Pet., 51-52. This is further supported by Lisogurski's disclosure that “[a]ny suitable configuration of light source 316 and detector 318 may be used” (Lisogurski, 17:42-45; Pet., 53) and the evidence showing that a POSITA would have been motivated to implement LeBoeuf's teachings in multiple ways such that the configuration was not dictated purely by the structure of the earbuds. Ex.2045, 182:18-24, 205:6-25, 339:15-17, 340:2-10 (confirming no wholesale copying of embodiment); Pet., 52-53; Anthony, ¶¶262-267. PO's cites to Dr. Anthony's testimony confirm, at best, that LeBoeuf's embodiments include components other than LEDs and detectors, not that the arc arrangements cannot be realized without those components. POR, 33-34. Indeed, PO does not argue that

the arc arrangements of the LEDs/detectors are limited to earbuds, nor provide any basis for such an argument. POR, 31-33. Anthony-Reply, ¶¶31-33.

VI. LISOGURSKI DISCLOSES AND RENDERS OBVIOUS THE “IDENTIFICATION OF AN OBJECT” LIMITATION (CLAIMS 12-13, 26)⁶

Lisogurski discloses and renders obvious “identification of an object” of claims 12 and 26. As the Board already found, Lisogurski’s sensor measures SpO₂ by “distinguishing and identifying oxyhemoglobin in blood,” thus satisfying “identifying an object.” ’484-RFWD, 6; Lisogurski, 4:36-51; Pet., 65-67 (explaining [26] is met for the same reasons as [12], and [13] depends from [12] and contains additional limitations not challenged by PO). Collateral estoppel should apply upon the Federal Circuit’s affirmation of the Board’s remand decision and, at the very least, the same rationale should apply to reject PO’s arguments. Dr. Anthony similarly testified that Lisogurski’s measurement involves “distinguishing and identifying the oxyhemoglobin blood constituents,” consistent with the Board’s

⁶ PO has disclaimed claims 1, 3, 11, 19, and 20 of Ground 3 and claims 2, 14, and 27 of Ground 4. Regardless, as detailed in the Petition and as further set forth in this and the next sections, Lisogurski in view of LeBoeuf or in view of LeBouef and Tran render obvious these claims and the remaining claims 4-6, 12-13, 15-16, 21-22, and 26. Pet., 60-67. Anthony-Reply, ¶¶34-35.

construction and decision in the prior '484 IPR. Ex.2045, 217:14-218:1; Pet. 15, 65-66; Anthony, ¶¶55, 352-360. Anthony-Reply, ¶¶36-39.

PO argues that “to identify an object, the system must determine what the object is, recognizing it as a particular thing” (POR 38)—this is exactly what the Board found that Lisogurski discloses. The Board addressed essentially identical claim limitations in the '484-RFWD, finding Lisogurski discloses “identify an object” because Lisogurski’s sensor “calculat[es] an amount of a blood constituent, e.g., oxyhemoglobin” in a tissue sample, which involves distinguishing and identifying oxyhemoglobin in blood and thus identifying an object (oxyhemoglobin) from other blood constituents. Pet., 65 (citing '484-RFWD, 6 (citing '484-Pet.-Reply, 24); Lisogurski, 4:36-51). The same rationale should apply here. *Cf.* POR, 44-45. PO omits this fact in its POR, and attempts to deviate from the '484-RFWD. POR 44-50. It cannot. Anthony-Reply, ¶¶40, 43.

First, PO incorrectly assumes that Lisogurski’s blood oxygen saturation measurement is “detecting,” but not “identifying,” the blood constituents because Lisogurski allegedly presupposes presence of blood oxygen. POR, 36-37 (arguing Lisogurski presupposes blood oxygen as an “analyte” or “a substance that is the subject of an analysis”), 39, 41-44. This directly contradicts PO’s position in district court, where it argues that simply detecting a presence of a user’s wrist satisfies this limitation. Ex.1140, 121-124 (charting a substantially similar limitation). Further,

the Board already disagreed with PO's argument in the '484-RFWD based on the Federal Circuit's construction of "identifying an object"—it recognized differences between detecting and identifying and, even then, found that Lisogurski discloses identifying an object. '484-RFWD, 3-7; Lisogurski, 4:36-51; Pet., 65. This moots PO's alleged distinction between "analyte" and "constituent" based on its false premise that Lisogurski presupposes what it measures. POR, 37. Anthony-Reply, ¶¶41, 43-46.

PO's logical fallacy is illustrated by its own analogy comparing Lisogurski's blood oxygen sensor to a scale or a pH meter. POR, 36. Unlike a scale or a pH meter that cannot recognize what it measures, Lisogurski's sensor provides a measurement only upon identification of blood oxygen in the object being analyzed, and would not recognize or measure other blood constituents even if they are present. 484-RFWD, 4-7 ("As Lisogurski discloses a method of measuring oxygen saturation that uses different wavelengths to distinguish hemoglobin from ... oxyhemoglobin, Lisogurski teaches identifying an object"); Pet., 65; Anthony, ¶¶355-356); Ex.2045, 219:20-221:7. This is precisely what PO claims as required by "identification of an object." POR, 38. Anthony-Reply, ¶44.

That Lisogurski performs "detection" does not mean that it does not perform "identification of an object" (POR, 13-14, 38-44)—nor did Dr. Anthony testify otherwise (Ex.2045, 213:12-19, 216:12-21). Indeed, the Board's constructions for

detection and identification are not mutually exclusive—“notic[ing] the existence or presence of something” leads to “recognizing or establishing” that something as blood oxygen, as Lisogurski does. Pet. 15, 65-66; Ex.2045, 234:5-245:25; *see also* ’484-RFWD, 4-7; Pet., 65 (citing Lisogurski, 4:36-62); Anthony, ¶¶355-356. Indeed, Lisogurski’s Fig. 4 discloses “determining a physiological parameter” to calculate oxygen saturation—rather than presupposing hemoglobin’s presence, Lisogurski thus determines, recognizes, or establishes that the sample contains blood oxygen to make the measurement. *Contra* POR, 39-41 (citing Lisogurski, Fig. 4); *see also* Lisogurski, 20:49-60 (“the system may determine a physiological parameter using information from the attenuated photonic signals”). PO’s efforts to mischaracterize Dr. Anthony’s testimony based on few limited recitations of “detection” also fails. POR, 42-44. As Dr. Anthony testified, Lisogurski’s blood oxygen measurement requires a confirmation that there is an object “responding to the light that you’re using” (Ex.2045, 43:12-16) and distinguishes or identifies blood oxygen using “certain wavelengths” (Ex.2045, 44:23-44:4). Anthony-Reply, ¶¶46-47.

PO’s improper attempts to import elements into the limitation likewise fails. PO attempts to re-characterize “identification of an object” as requiring various known techniques such as pattern matching algorithms, “using a[n unspecified] wider wavelength range,” “various signal processing techniques,” and spectrum

correlation. POR, 37-38. Anthony-Reply, ¶48. None of these are required by the claims, as Dr. Efimov agreed, and PO cannot import the specification into the claim limitations. Ex.1127, 239:20-240:16; *Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1348 (Fed. Cir. 2009) (“The claims, not specification embodiments, define the scope of patent protection.”).

Finally, PO fails to discredit Petitioners’ and Dr. Anthony’s agreement with the Board’s prior ’484-RFWD. POR, 44-50. Importantly, PO does not argue that the Board should deviate from its prior decision and only notes the ’484-RFWD is not final—it will be once the Federal Circuit affirms and, regardless, the Board’s careful analysis concerning essentially the same claim limitation should equally apply here. POR, 45; Pet. 65-66. Anthony-Reply, ¶¶38-43.

PO’s remaining arguments focus on discrediting Dr. Anthony’s opinions. None succeeds. **First**, PO mischaracterizes Dr. Anthony’s declaration as conclusory because he reached the same conclusion as the ’484-RFWD decision. POR, 44-47. But PO’s own quotation of Dr. Anthony’s declaration confirms his careful analysis of the Board’s prior decision, and why that decision confirms that Lisogurski “distinguish[es] and identif[ies] the oxyhemoglobin blood constituent” consistent with his opinion. POR, 45-47 (quoting Anthony, ¶355). What PO argues as a “bare conclusion” is in fact Dr. Anthony’s conclusion following a detailed analysis of the ’484-RFWD. Anthony, ¶¶352-355. Anthony-Reply, ¶41.

Second, PO incorrectly argues that Dr. Anthony improperly incorporated his prior testimony into his declaration for this proceeding, and that the prior testimony does not support the Board’s prior decision. POR, 47-48. But Dr. Anthony’s “prior testimony” has been resubmitted in this proceeding (Ex.1010) and there is no improper incorporation by reference. Regardless, Dr. Anthony’s declaration here provides independent explanation as to how Lisogurski distinguishes and identifies hemoglobin and oxyhemoglobin in blood. Anthony ¶355. Anthony-Reply, ¶¶41-42.

Likewise, Dr. Anthony never opined that the Board’s decision is supported by his prior testimony that addressed a different aspect of Lisogurski, but instead opined that it is consistent with the Board’s decision. Anthony, ¶355; POR, 47-50. Unlike *Alexsam* (POR, 49), where the accused infringer did not present any expert testimony and simply introduced the systems, Dr. Anthony explained his reasoning for agreeing with the Board’s ’484-RFWD and cited to the ’484-RFWD and his previous declaration, both of which included additional details supporting his current declaration. Anthony, ¶355; ’484-RFWD 4-7; ’484-Declaration ¶¶38-39. Anthony-Reply, ¶42.

Even if Dr. Anthony’s declaration is somehow improper (it is not), it does not mean that Petitioners failed to meet their burden. *Cf* POR, 49; *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1079 (Fed. Cir. 2015) (“[n]o rule requires a Petition to be

accompanied by any declaration” due to the Board members’ own expertise). The Petition details how the limitation is met, consistent with the Board’s detailed analysis that squarely applies here.

VII. LISOGURSKI DISCLOSES AND RENDERS OBVIOUS IMPROVING THE SNR OF THE “SELECTION OR IDENTIFICATION OF AN OBJECT” (CLAIMS 12-13, 26)

PO mixes and matches different claim elements. [12.b] undisputedly requires that “the measurement system ... improve a [SNR] of the selection or identification by applying...multivariate techniques” and claim 26 recites substantially identical language. POR, 50. Lisogurski teaches a physiological monitoring system “increase[ing] the brightness of the light sources...to improve the [SNR]” in response to “background noise”—a POSITA would have understood, and at minimum found obvious, that these techniques improve SNR and thus the accuracy of measurements when applied to Lisogurski’s identification of certain blood constituents. Pet. 65-67 (explaining [26] is met for the same reasons as [12], and [13] depends from [12] and contains additional limitations not challenged by PO); Lisogurski, 9:49-52. A POSITA would have understood that improving the measurements would in turn improve the object identification performed using these measurements. *Id.* Lisogurski also discloses taking measurements using multiple LEDs and wavelengths, producing multivariate input data for multivariate techniques to improve the identification of objects. Lisogurski, 11:13-27, 19:20-31.

The Petition further explains that such multivariate techniques are used to improve the accuracy of measurements, so a POSITA would have at least found it obvious to use these techniques to improve the SNR of the object identification—indeed, as Dr. Anthony explained and PO did not dispute, multivariate techniques are simply a use of “multivariate input data.” Pet. 66; Anthony, ¶358.⁷ Anthony-Reply, ¶¶49-53.

Ignoring the claim language and the Petition, PO argues that “[a] POSITA would not have been motivated to apply Tran’s *stroke-detection method*...for improving SNR of ‘selection or identification of an object.’” POR, 51-52. But, Petitioners apply Tran’s teachings of artificial intelligence and pattern recognition to Lisogurski only in [12.a], neither of which relates to improving SNR of object identification in [12.b]. Pet., 61-66. Anthony-Reply, ¶¶54-56.

To the extent PO intended to address [12.a], the claim simply requires that “the measurement system is configured to perform pattern identification or classification,” and does not require improving SNR of “selection or identification of an object.” And, regardless, the Board already found the limitation met by

⁷ PO cites to the ’304 specification to argue that pattern matching is required for the improving SNR limitation (POR, 51), but it is not part of the claim language, which does not even suggest pattern matching. Pet., 63-66; *Kara Tech.*, 582 F.3d at 1348. Anthony-Reply, ¶54.

Lisogurski in view of Tran. '484-FWD, 53; Pet., 63-64. PO is estopped from challenging this. Pet., 16, 64-64. Anthony-Reply, ¶57.

**VIII. LISOGURSKI IN VIEW OF LEBOEUF, TRAN, AND MARBACH
RENDERS OBVIOUS “APPLYING...MULTIVARIATE
TECHNIQUES” TO IMPROVE SNR (CLAIMS 12-13, 26)**

Marbach discloses performing “measurement algorithms” on “multivariate input data” of measurement signals to “better the measurement accuracy a.k.a. SNR,” consistent with the claims requiring improved signal-to-noise ratio “by applying...multivariate techniques” of claims 12 and 26. Marbach, 12:19-27, 11:57-63; Pet., 75, 65-67 (explaining [26] is met for the same reasons as [12], and [13] depends from [12] and contains additional limitations not challenged by PO). A POSITA would have been motivated to apply Marbach’s “multivariate input data” teachings to Lisogurski to improve the accuracy and SNR of the identification of objects, an issue both Lisogurski and Marbach recognize. Pet., 75-76; Anthony, ¶405 (“Marbach specifically emphasizes that combined analysis of multiple signals enables more accurate quantification of analytes”). Anthony-Reply, ¶¶58-59.

As discussed in §VII, PO does not dispute that a POSITA would have found it obvious to implement multivariate techniques in Lisogurski to improve SNR of the identification of an object. POR, 50-52; Pet. 65-66. This alone moots PO’s challenge against this limitation. Anthony-Reply, ¶¶58.

PO's argument against Marbach likewise fails. Marbach's multivariate functionality is not tied to Marbach's particular multivariate probes and probe geometry—PO's contrary argument ignores Marbach's explicit disclosure that a variety of probes may be used. POR, 55-57; *see, e.g.*, Marbach, Figs. 1-5; 16:30-18:19. Indeed, multivariate techniques require no specific or specialized hardware—instead, as Marbach notes, it just involves algorithms performed on “multivariate input data.” Marbach, 12:19-27. Additionally, the Petition focuses on algorithmic calculations and improving measurement, rather than implementing probe geometry in Lisogurski. Pet., 75; Marbach, 12:19-27. Likewise, PO's reliance on “hardware noise floor” requirement is irrelevant and, regardless, Lisogurski already satisfies the condition—Lisogurski's sensor detects and measures various signals, which are thus beyond the hardware noise floor. Lisogurski, 11:9-10, 11:20-27. PO's arguments regarding Lisogurski lacking the structure therefore are irrelevant. POR, 55-58. Further, Lisogurski alone and Lisogurski in view of LeBoeuf disclose a plurality of emitters and detectors—it already detects and produces the multivariate input data to which Marbach's measurement algorithms for improving accuracy and SNR would be applied. Lisogurski, 10:48-64; LeBoeuf, ¶105, FIG. 8B. Anthony-Reply, ¶¶60-62.

IX. NO SECONDARY CONSIDERATIONS EXIST

A. No Evidence of Copying or a Nexus

PO wrongly accuses Samsung of copying [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

[REDACTED] POR, 59. Mere alleged knowledge of related patents and generic concepts cannot show nexus or copying. *Enova Tech. Corp. v. Seagate Tech. (US) Holdings Inc.*, 706 F. App'x 987, 995 (Fed. Cir. 2017) (knowledge of the patent and products embodying patent are relevant, but not “sufficient to establish copying”).⁹

⁸ PO also includes [REDACTED]

[REDACTED] but fails to identify any corresponding claim language. POR, 60.

⁹ PO's [REDACTED]

[REDACTED]

[REDACTED] are separate, independent third party entities and are not involved in this IPR or the Texas Case—in contrast to Petitioners Samsung Electronics Co., Ltd. (“SEC”) and Samsung Electronics America, Inc.

The Board already found each such “SNR-improvement technique” known in the art. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Anthony-Reply, ¶¶64-66.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Anthony-Reply, ¶71.

(“SEA”). POR, 67; Ex.2116, 1 (asserting that SEC and SEA manufactures and sells allegedly copying products); Ex.1134-1136.

No evidence shows Samsung’s copying “SNR-improvement techniques”
[REDACTED]—PO’s reliance (POR, 60) on the infringement contentions cannot establish copying. *Fleming v. Cirrus Design Corp.*, 28 F.4th 1214, 1224 (Fed. Cir. 2022) (“Not every...product that arguably falls within the scope of a patent is evidence of copying. Otherwise[,] every infringement suit would automatically confirm the nonobviousness of [a] patent.”); *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004) (“[C]opying requires the replication of a specific product”). Anthony-Reply, ¶¶70-72.

PO’s only remaining support for Samsung’s alleged copying is Dr. Efimov’s declaration—it likewise fails. POR, 60 (Ex.2043, ¶¶228-233). **First**, Dr. Efimov’s opinion is based on his misunderstanding that Dr. Islam’s “SNR-improving techniques” are proprietary solely for being “essentially covered by patents”—those “proprietary techniques” were public knowledge, as the Board confirmed. Ex.1127, 57:21-58:10. Anthony-Reply, ¶¶66-67.

Second, Dr. Efimov concludes copying based solely on PO’s infringement contentions (“PIC”) in the Texas Case. Ex.2043, ¶¶228-233 (citing Exs.2106, 2116). The PIC fails to show Samsung’s copying, let alone infringement. *E.g.*, Ex.2116, 22-28, 50-98, 109-123, 130-134, 141-172, 189-231. For example, for [REDACTED]
[REDACTED] the PIC relies on documentation concerning multiple third-party processing circuitries and their available features

(including programmable LED current), which do not show that the limitation is met—nor does the PIC show whether or how such processors are implemented a Samsung product. Ex.2116, 22-28, 166-172. Dr. Efimov likewise admitted not having examined the Samsung Accused Products—or Samsung’s internal documents—while acknowledging the need to assess the products or their technical descriptions to confirm their features. Ex.1127, 71:11-98:7; Ex.1128, 34:6-50:19, 74:17-76:12, 78:9-79:12, 82:12-83:3, 88:2-89:3, 118:12-119:18 (acknowledging the same). PO’s remaining, purported support likewise provides insufficient technical detail. Ex.2116, 50-98, 109-123, 130-134, 141-165, 189-231; Ex.1127, 169:4-15, 195:1-4 (confirming no Samsung document with technical details cited in the PIC). This is in stark contrast with Lisogurski—which the Board previously found meets this limitation twice. Lisogurski, 6:3-6; ’484-FWD, 27; ’533-FWD, 26. Anthony-Reply, ¶¶67-69.

Third, Dr. Islam fails to identify what techniques, other than generic, well-known information that the Board already found to be met by the prior art, was shared with Samsung—likewise, Dr. Efimov admitted no knowledge regarding most entities or individuals [REDACTED], Samsung’s corporate structure, or how any such entities or individuals relate to Samsung’s wearable-device development. Ex.1127, 107:7-111:4, 126:2-139:7. He could not have opined on what information SEC—i.e., developer of the accused product—received or how

the information was used, if at all, in the accused products. Indeed, the materials cited by Dr. Efimov and Dr. Islam generally identify third-party contacts [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]. Ex. 2100, ¶8; Ex. 2105 at OMS_SAM0031867. And whether Dr. Islam allegedly offered to help Samsung is irrelevant to whether the alleged techniques were actually incorporated, let alone reflected, in Samsung's devices or whether Samsung had already developed any such techniques prior to the alleged meeting. Ex.2043, ¶230. Anthony-Reply, ¶¶70-72.

B. No Evidence of Long Felt Need or a Nexus to the Claims

Each of the '304 limitations that PO identifies as resolving alleged long-felt needs *was already known in the art*, as the Petition demonstrates and Board agreed in the prior FWDs (*see* §IX.A; Pet. 24-26, 30-33, 47-49, 55-57). POR, 61-63 (“...increase the [SNR] by increasing light intensity...,” “... increase the [SNR] by increasing a pulse rate of at least one of the plurality of semiconductor sources from an initial non-zero pulse rate ...,” “...improve the [SNR] by differencing the first signal and the second signal,” “receiver comprises a plurality of detectors arranged along a first arc,” “...a receiver configured to: ... synchronize to the light source”); Ex.1128, 30:1-15, 48:8-49:3, 74:1-14, 85:7-17, 99:9-101:4, 104:4-105:26, 132:10-133:16, 139:8-15 (named inventor admitting these concepts were known in the field

and admitting he did not know whether they were used in wearable devices before his patents). Anthony-Reply, ¶¶67, 73-74.

Further, PO fails to establish that the '304 indeed resolved the alleged needs to avoid “the patient [to] remain still” or “controlled clinical environments,” let alone that the '304 provided any improvement over the prior art. POR, 61-62. Dr. Islam alleges that although “premium wearable devices” used his “techniques” by 2017 (Ex.2103 at OMS_SAM0031785), the “SNR ... problem” was not “solved” in those devices (Ex.2100, ¶33). Thus, his “techniques” did not resolve any alleged long-felt need. No nexus between PO’s hand-picked—already known—limitations (individually or collectively) and the alleged issues being resolved exists. POR. 61-63; *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (requiring nexus); *In re Karpf*, 758 F. App'x 960, 965 (Fed. Cir. 2019) (finding no evidence, other than attorney argument, that the claimed invention meets that [unresolved] need”). Anthony-Reply, ¶¶75-80.

X. CONCLUSION

PO’s arguments do not distinguish any Challenged Claim from the prior art. The Claims should be found unpatentable.

Respectfully submitted,

Dated: July 30, 2026

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. §42.24(c) and (d), the undersigned hereby certifies that this Petitioner's Reply to Patent Owner's Response complies with the type-volume limitation of 37 CFR §42.24(c) because, exclusive of the exempted portions, it contains 5,595 words as counted by the word processing program used to prepare the paper.

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing PETITIONERS' REPLY TO PATENT OWNER'S RESPONSE was served by filing this document through the Patent Trial and Appeal Case Tracking System (P-TACTS) as well as providing a courtesy copy via electronic mail to the following attorneys of record for each party as listed below:

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