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Paper 26
Date: February 14, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE, INC.,
Petitioner,

v.

OMNI MEDSCI INC.,
Patent Owner.

IPR2021-00453
Patent 10,517,484 B2

Before GRACE KARAFFA OBERMANN, BRIAN J. McNAMARA, and SHARON FENICK, *Administrative Patent Judges.*

McNAMARA, *Administrative Patent Judge*.

ORDER
Conduct of the Proceeding
Denying Post Remand Briefing
37 C.F. R. § 42.5

JUDGMENT
Final Written Decision on Remand
Determining All Challenged Claims Unpatentable
35 U.S.C. §§ 144, 318(a)

I. BACKGROUND

Apple Inc. ("Petitioner") filed a Petition challenging the patentability of claims 1–23 of U.S. Patent No. 10, 517,484 B2 ("the '484 patent"). Paper 1 ("Petition" or "Pet."). On August 6, 2021, we instituted an *inter partes* review of all claims on all challenge grounds. Paper 7. Omni MedSci, Inc. ("Patent Owner") filed a Patent Owner Response (Paper 10, "PO Resp."), Petitioner filed a Petitioner Reply (Paper 11, "Pet. Reply") and Patent Owner filed a Sur-reply (Paper 13, "PO Sur-reply"). A transcript of an oral hearing held on May 5, 2022 (Paper 20, "Hr'g. Tr.") was entered into the record.

On August 3, 2022, we entered a Final Written Decision (Paper 22, "Final Decision" or "Final Dec.") determining that Petitioner had demonstrated that claims 1, 2, 7, and 15–23 were unpatentable and had not demonstrated that claims 3–6 and 8–14 were unpatentable. Petitioner appealed our determination concerning claims 3–6 and 8–14 to U.S. Court of Appeals for the Federal Circuit. *See* Paper 23, Notice of Appeal. On September 13, 2024, the Federal Circuit affirmed-in-part on claim construction issues, but vacated-in-part and remanded the case to us for further proceedings and consideration of an alternative argument properly raised in Petitioner's Reply under the affirmed construction. *See* Paper 24 ("Mandate"); Paper 25 ("Fed. Cir. Dec.").

On October 29, 2024, we conducted a telephonic hearing with the parties to address their request for additional briefing and to discuss whether additional briefing was appropriate in this case. A transcript of the hearing was entered into the record. Ex. 1068 ("Briefing H'rg. Tr.").

No appeal was taken as to claims 1, 2, 7, and 15–23. Consistent with the Federal Circuit's Mandate, we have reviewed the merits and determine

that claims 3–6 and 8–14 are unpatentable. Having determined that claims 3–6 and 8–14 are unpatentable, and recognizing that all other claims have previously been determined to be unpatentable, we determine that claims 1–23 are unpatentable.

II. THE FEDERAL CIRCUIT DECISION

Claim 3 depends from claim 1 and recites that the wearable device of claim 1 "is at least in part configured to identify an object, and to compare a property of at least some of the output signal to a threshold." Ex. 1001, 37:43–46. In relevant part, claim 8 similarly recites that the wearable device is at least in part configured to identify an object. *Id.* at 38:63–67.

In our Final Decision, we determined that the term "identify an object" in claims 3 and 8 is distinguished from the term "detect an object," e.g. as in claim 1. Final Dec. 8–10. The Court affirmed our construction of "identify an object" to mean "to recognize or establish an object as being a particular thing." Fed. Cir. Dec. 10. The Court remanded, however, for further consideration of a "properly raised" argument Petitioner advanced in the Petitioner Reply with respect to our construction, referred to by the Federal Circuit as "the alternative argument.". *Id.* at 2, 13.

III. ADDITIONAL BRIEFING

During the telephonic hearing on additional briefing, Petitioner acknowledged that during the course of the proceeding Petitioner "had raised the alternative reading or basis for why the claims were obvious under the construction that was advanced by [Patent Owner] in the proceeding." Briefing Hr'g Tr. 9:10–13. Petitioner also acknowledged that "it really is the discretion of the Board here to decide how much of a focus they want to get out of the parties on their positions relating to the issue that's disputed." *Id.* at 9:20–23. Petitioner further stated, "we presented our arguments why[,]

in this alternative claim construction[,] the evidence did show that the claims were obvious and one of the variables was how the devices identify constituents, specific things in the blood. We believe that was the basis of our position." *Id*. at 16:1–6. As to the subject matter of any additional briefing, Petitioner also stated "it's the same evidence, the same rationale for the argument, the same basis." *Id.* at 16:13–14.

Patent Owner also acknowledged, at least implicitly, that it was provided an opportunity to address the claim construction adopted in our Final Decision and affirmed by the Federal Circuit. *Id.* at 8:16–25 (asking Petitioner "what would necessitate further briefing as to" the remaining arguments to be addressed); 12:10–16 (posing same question to Patent Owner); 12:21–13:7 (Patent Owner's counsel acknowledging that both claim constructions had been "at issue at the time [Patent Owner] filed [its] briefs in the IPR" and requesting briefing only to provide "focused argument" as opposed to the "diluted arguments" in the current record); 14:24–15:11 (Patent Owner's counsel acknowledging that the record did address the claim construction).

Our mandate is to consider the argument the Court determined we did not consider in the Petitioner Reply, which argument, as each party acknowledges, both parties had the opportunity to discuss in the briefs that are in our current record. Under the circumstances, we determine that no additional briefing is required to carry out that mandate.

IV. ANALYSIS

A. Claims 3 and 8

We begin our analysis with claims 3 and 8, as claims 4–6 depend from directly or indirectly from claim 3 and claims 9–14 depend directly or indirectly from claim 8.

The arguments in the Petitioner Reply relating to the construction of the claim term "identify an object" as meaning "to recognize or establish an object as being a particular thing" apply equally to claims 3 and 8 and are reproduced below in their entirety.

> Even if [Patent Owner's] construction were accepted, the "identify[ing]" element is taught by both Lisogurski and Tran. Lisogurski and Tran each teach techniques for measuring blood oxygen saturation and other blood constituents. Pet., 58 (stating Tran's monitored information "includes pulse oximetry measurements"), 63 (discussing Lisogurski's "blood oxygen saturation"); Ex.1011, 4:36-41 (describing "calculat[ing]… an amount of a blood constituent (e.g., oxyhemoglobin)"); Ex.1064, 9:38-42, 37:2-12. Measuring blood oxygen saturation requires identifying and quantifying both the oxygenated and deoxygenated hemoglobin in the blood, which Lisogurski and Tran do by measuring reflected light at particular wavelengths known to be associated with each substance. Ex.1003, ¶¶38-39; Ex.1011, 4:42-51; Ex.1064, 37:2-12, 50:10-15. That is the same technique disclosed in the '484 patent. Ex.1001, 11:45-53, 11:59-12:3. Thus, Lisogurski and Tran both teach detecting and identifying blood constituents—oxygenated and deoxygenated hemoglobin—which satisfies Omni's construction.

Pet. Reply 24. At the oral hearing, Petitioner argued that Lisogurski teaches identifying blood constituents. Hr'g. Tr. 21:19–22:21.

The Final Decision states "[a]lthough blood constituents would appear to be objects in the context of claims 3 and 8, . . . it is not clear how one could measure such constituents without identifying them." Final Dec. 51. We determined that "the Petition does not sufficiently articulate support for Petitioner's assertions" and that

> Petitioner's arguments, which concern comparing detected *signals* to a variety of thresholds and providing *parameters for alert generation*, are insufficient to support Petitioner's contention that Lisogurski, Carlson, and Tran disclose the limitation in claims 3 and 8 that the wearable device (claim 3) or

> the wearable device, smartphone or tablet (claim 8) is configured to 'identify an object' i.e., 'to recognize or establish an object as being a particular thing.'

Id. at 52 (after discussing arguments found at Pet. 58, 63).

A detailed review of the references cited (if not extensively discussed) in the Petitioner Reply, the portions of the Petition referenced in the Petitioner Reply, and the testimonial evidence provided by Petitioner's expert, Dr. Brian W. Anthony, indicates that Petitioner is correct in its assertion that, at least because Lisogurski discloses calculating an amount of a blood constituent, e.g., oxyhemoglobin, the limitations of claim 3 are taught by the proposed combination of references. In particular, Petitioner notes that Lisogurski and Tran measure deoxygenated hemoglobin by measuring reflected light at particular wavelengths associated with each substance. Pet. Reply 24 (citing Ex.1003 (Anthony Decl.) ¶¶ 38–39; Ex. 1011, 4:42–51; Ex. 1064, 37:2–12, 50:10–15).

Dr. Anthony testifies that, "[b]y measuring how much light is absorbed by the tissue and how the absorption changes over time, a device can calculate parameters that are related to the properties of the tissue and blood." Ex. 1003 ¶ 38. Noting that hemoglobin reflects more red light when oxygenated than when deoxygenated, but reflects the same amount of infrared (IR) light when oxygenated and deoxygenated, Dr. Anthony further testifies that a device that "measures the absorbed red and IR light multiple times per second can determine: (i) the ratio of oxygenated to deoxygenated hemoglobin (oxygen saturation) and (ii) how the volume of blood in the tissue changes, allowing detection of a person's pulse." *Id.* ¶ 39 (citing Ex. 1019 at 769, 771).

Lisogurski discloses a similar approach to determining blood saturation stating "[t]he light intensity or the amount of light absorbed may then be used to calculate any of a number of physiological parameters, including an amount of a blood constituent (e.g., oxyhemoglobin) being measured as well as pulse rate and when each individual pulse occurs." *See* Ex. 1011, 4:36–62. As Lisogurski discloses a method of measuring oxygen saturation that uses different wavelengths to distinguish hemoglobin from oxygen carrying hemoglobin, i.e., oxyhemoglobin, Lisogurski teaches identifying an object, i.e., the blood constituent oxyhemoglobin.

Based on the foregoing, we determine that Petitioner demonstrates by a preponderance of the evidence that claims 3 and 8 are unpatentable.

B. Claims 4–6 and 9–14

We structure this Decision to address remaining appealed claims 4–6 and 9–14 based on their dependencies and the challenges asserted in the Petition.

1. *Claims 5 and 13*

The Petition includes a ground asserting that claims 5 and 13 would have been obvious over a combination of Lisogurski, Carlson, Tran, and Isaacson. Pet. 66–72.

Based on our conclusions concerning claims 3 and 8, the substance of Petitioner's additional arguments relating to claims 5 and 13 was not addressed in the Final Decision. Final Dec. 54–55. Similarly, we did not address the substance of Petitioner's additional arguments relating to claims 6 and 14 over a combination including Isaacson, which depend

respectively from claims 5 and 13.[1] *Id.* at 59. Therefore, to the extent not addressed in the Final Decision, we address the contentions relating to claims 5 and 13 here, and contentions relating to claims 6 and 14 in the next section of this Decision.

Claim 5, which depends indirectly from claim 3, and claim 13, which depends indirectly from claim 8, both recite details of the location of spatially separated detectors. Petitioner cites Isaacson as disclosing a pulse oximetry system sensor for use on a patient's arm that has two emitters and two detectors separated by varying distances. Pet. 66 (citing Ex. 1063, 1:21–40, 2:57–58, 2:63–66, 3:66–4:3, 3:44–54, 6:32–34). Petitioner notes that Isaacson teaches selecting the distances between the emitters and detectors to allow measuring light that has penetrated different depths of tissue, with greater spacing allowing measuring of greater depth. *Id.* (citing Ex. 1063, 1:41–45, 5:10–15; Ex. 1003 ¶¶ 234–235).

The Patent Owner Response does not address the substance of Isaacson, arguing only that Petitioner fails to show evidence of a motivation to combine the references in the manner claimed. PO Resp. 38–40 (arguing Petitioner applied impermissible hindsight to pick and choose from the references without articulating a reason for the combination). Our analysis of Petitioner's challenge to claims 1–4, 7–12, and 15–22 as unpatentable over Lisogurski, Carlson, and Tran, determined that Petitioner had demonstrated that a person of ordinary skill would have had reason to

[1] Although Petitioner's challenge to claim 23 also ostensibly relied on a combination including Isaacson, because Petitioner's contentions for claim 23 were asserted without reference to Isaacson, our Final Decision determination concerning claim 23, which was not appealed, did not require an analysis of Isaacson or of the propriety of combinations including Isaacson. Final Dec. 59–60.

combine the teachings of Lisogurski, Carlson, and Tran. Final Dec. 46–48. As claims 1–2, 7, and 15–22 were found unpatentable and were not the subject of an appeal, we do not revisit the conclusion that a person of ordinary skill would have had reason to combine the teachings of Lisogurski, Tran, and Carlson. *See generally* Final Dec., Fed. Cir. Dec.

As to the further combination with Isaacson, Patent Owner contends only that Petitioner failed to describe a purported motivation to combine the teachings of Isaacson and Lisogurski. PO Resp. 38; Pet. Sur-reply 24–25 (arguing that Petitioner asserted only a motivation to combine each reference with Lisogurski).

Petitioner counterargues that it is not required to show why a person of ordinary skill would have considered every permutation of these references together and that it provided specific reasons for including features of Isaacson into Lisogurski's device. Pet. Sur-reply 24–25. According to Petitioner, a person of ordinary skill would have had reason to incorporate Isaacson's sensor (an arrangement of LEDs and detectors) into Lisogurski's device, which taught that any known sensor layout could be used. *Id.* (citing Ex.1011, 17:39–45; Ex.1003 ¶¶ 239–240). Petitioner further argues that the ordinarily skilled artisan would have looked to Isaacson because it discloses a known arrangement for that the sensor component of Lisogurski's device, and because it also taught solutions to potential problems identified in Lisogurski (e.g., with skin pigmentation). *Id.* (citing Pet. 68–69; Ex.1003 ¶ 243; Ex.1063, 7:59–62, Fig. 1).

In response to similar arguments Patent Owner raised in the context of claim 23 concerning the motivation to combine the teachings of Valencell-093 with those of Lisogurski, Tran, and Carlson, we determined that

Petitioner was not required to show why a person of ordinary skill would have considered every permutation of the references. Final Dec. 59.

Based on the arguments and evidence of record, we similarly determine that Petitioner has demonstrated a person of ordinary skill would have recognized that Isaacson is particularly relevant to the wearable devices described by Lisogurski. Having considered the arguments and evidence of record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 5 and 13 are unpatentable as obvious in view of the combined teachings of Lisogurski, Tran, Carlson, and Isaacson.

2. *Claims 6 and 14*

Petitioner challenges claims 6 and 14 as unpatentable over the combined teachings of Lisogurski, Carlson, Tran, Isaacson, and Valencell-093. Pet. 72–77. Claim 23, which we found to be unpatentable in a portion of the Final Decision that was not the subject of any appeal, was also challenged on that basis. Final Dec. 59–60 (finding claim 23 unpatentable over the combined teachings of Lisogurski, Carlson, Tran, and Valencell-093, without Isaacson). Patent Owner's counterarguments are limited to contending that Petitioner has not demonstrated adequately a reason to combine the references in the manner claimed. PO Resp. 40–42.

As discussed above, we determine that Petitioner has demonstrated a person of ordinary skill would have had reason to combine the teachings of Isaacson with those of Lisogurski, Tran, and Carlson, for reasons similar to those applicable to the combination of Lisogurski, Carlson, and Tran with the teachings of Valencell-093. Again, we rely on the same reasoning to determine that Petitioner has demonstrated that a person of ordinary skill in the art would have had reason to combine the teachings of Isaacson with those of Lisogurski, Tran, Carlson, and Valencell-093.

Like claim 23, claims 6 and 14 recite that the wearable device further comprises a reflective surface positioned to reflect at least a portion of the lens output light reflected from the tissue. Ex. 1001, 38:4–7, 39:34–37, 40:53–55. Having determined elsewhere in this Decision that claims 3–5 and 8–13 from which claims 6 and 14 depend are unpatentable, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 6 and 14 are unpatentable for the same reasons claim 23 is unpatentable. *See* Final Dec. 59–60.

3. *Claims 4 and 9–12*

Claim 9 depends from claim 8 and recites limitations similar to those of claim 17 that recite coupling spatially separated detectors to an amplifier having a gain adjusted to improve detection sensitivity. Claim 17 was found unpatentable and was not the subject of an appeal. *See* Final Dec. 45, 54. Having determined that claim 8 and claim 17 are unpatentable, we determine for the same reasons that Petitioner has demonstrated claim 9 is unpatentable.

Claim 10 depends from claim 9 and recites limitations similar to the artificial intelligence limitations recited in claim 18. Claim 18 was found unpatentable and was not the subject of an appeal. *See* Final Dec. 48–49. Having determined that claims 9 and 18 are unpatentable, we determine for the same reasons that Petitioner has demonstrated claim 10, which depends from claim 9, is unpatentable.

Claims 4 and 11 depend from claims 3 and 10, respectively, and recite limitations similar to the pattern matching limitations of claim 19, which was found unpatentable and was not the subject of an appeal. *See* Final Dec. 53. Having determined that claims 3, 10, and 19 are unpatentable, we

determine for the same reasons that Petitioner has demonstrated claims 4 and 11 are unpatentable.

Claim 12 depends from claim 10 and recites limitations similar to the pattern identification and classification limitations of claim 21. Claim 21 was found unpatentable and was not the subject of an appeal. *See* Final Dec. 53. Having determined that claims 10 and 21 are unpatentable, we determine for the same reasons that Petitioner has demonstrated claim 12 is unpatentable.

V. CONCLUSION

As a result of the above determinations, we modify our Final Decision to determine that all challenged claims are unpatentable.

In summary:

Claim(s)	**35 U.S.C. §**	**Basis/ Reference(s)**	**Claim(s) Shown Unpatentable**	**Claim(s) Not shown Unpatentable**
1, 7, 15, 17	103	Lisogurski, Carlson	1, 7, 15, 17	
1–4, 7–12, 15–22	103	Lisogurski, Carlson, Tran	1–4, 7–12, 15–22	
5, 13	103	Lisogurski, Carlson, Tran, Isaacson	5, 13	
6, 14, 23	103	Lisogurski, Carlson, Tran, Isaacson, Valencell-093	6, 14, 23	
Overall Outcome			1–23	

VI. ORDER

In consideration of the above it is:

ORDERED that no additional briefing is authorized; and

FURTHER ORDERED that claims 1–23 are unpatentable.

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