

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

LIONRA TECHNOLOGIES LIMITED,
Patent Owner.

IPR2023-00796
Patent 7,260,141 B2

Before PATRICK R. SCANLON, NATHAN A. ENGELS, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Petitioner Apple Inc. filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–4, 7–10, and 18–22 of U.S. Patent No. 7,260,141 B2 (Ex. 1001, “the ’141 patent”). Patent Owner Lionra Technologies Ltd. filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition and any response thereto shows “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Upon consideration of the Petition and the evidence of record, we determine Petitioner has demonstrated a reasonable likelihood of prevailing in establishing unpatentability of at least one claim of the ’141 patent. Accordingly, we institute an *inter partes* review.

A. Real Parties-in-Interest

Petitioner identifies itself as the sole real party-in-interest. Pet. 72. Patent Owner identifies itself as the sole real party-in-interest. Paper 3, 2.

B. Related Matters

The parties state that the ’141 patent is involved in the following district court cases: *Lionra Techs. Ltd. v. Apple Inc.*, No. 6:22-cv-351 (W.D. Tex.); *Lionra Techs. Ltd. v. Samsung Elecs., Ltd.*, No. 1:22-cv-100 (E.D. Tex.); *Lionra Techs. Ltd. v. Motorola Mobility LLC*, No. 1:22-cv-2231 (N.D. Ill.); and *Lionra Techs. Ltd. v. Google LLC*, No. 6:22-cv-467 (W.D. Tex.). Pet. 72; Paper 3, 2.

C. Illustrative Claim

Of the challenged claims, claim 1 is the only independent claim, and claim 1 is copied below with bracketed labels added to reflect those referenced in the parties' briefs.

[1(p)] An apparatus for modulating and demodulating signals transmitted and received via an electronically steerable phased array antenna comprising a plurality of antenna elements, the apparatus comprising:

[1(a)] a baseband modulator configured to modulate outbound digital baseband signals to be transmitted via the phased array antenna;

[1(b)] a baseband demodulator configured to demodulate incoming digital baseband signals generated from signals received via the phased array antenna; and

[1(c)] a shared baseband processor configured to receive digital baseband signals including the modulated outbound digital baseband signals and the incoming digital baseband signals,

[1(d)] said shared baseband processor applying a single phase adjustment to each of the digital baseband signals to jointly account for both beamforming phase rotation and carrier phase rotation of individual antenna elements.

D. Alleged Grounds of Unpatentability

Petitioner asserts that claims 1–4, 7–10, and 18–22 would have been unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 7–10, 18, 22	103(a) ¹	Williams, ^{2,3} Fulton ⁴
20, 21	103(a)	Williams, Fulton, Trott ⁵

Pet. 16. Petitioner also supports its challenge with a Declaration of Zhi Ding, Ph.D. Ex. 1003.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

¹ The '141 patent issued from an application filed before the Leahy-Smith America Invents Act (“AIA”) revisions to 35 U.S.C. § 103 became effective. Therefore, we apply the pre-AIA version of § 103; however, our analysis would be the same under the AIA version of the statute.

² US 2002/0042290 A1; filed Oct. 11, 2001. Ex. 1004.

³ Petitioner contends Williams is prior art by virtue of the filing date of a related provisional application filed October 11, 2000 (Ex. 1005). Pet. 7. According to Petitioner, Williams’s claim 1 is supported by the provisional application (Pet. 8–12) and “all portions of *Williams* cited in the proposed ground below appear substantially identically in *Williams-Provisional*” (Pet. 12). Patent Owner does not contest Petitioner’s contention in its Preliminary Response.

⁴ US 7,466,697 B1; filed July 23, 2002. Ex. 1006.

⁵ US 6,545,979 B1; filed Nov. 12, 2002. Ex. 1007.

Petitioner contends a person of ordinary skill in the art at the time of the invention would have had “a bachelor’s degree in electrical engineering or equivalent from an accredited academic program with at least two years of work experience in the field of wireless communication” and “[a]dditional education or experience might substitute for the above requirements.” Pet. 4–5 (citing Ex. 1003 ¶¶ 35–37).

Patent Owner does not address the level of ordinary skill in its Preliminary Response. For the purposes of this Decision, we apply Petitioner’s level of ordinary skill, which is consistent with the level reflected by the ’141 patent and the asserted prior art.

B. Claim Construction

We construe claims using the principles set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc) and related cases. See 37 C.F.R. § 42.100(b) (2023). Under that precedent, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips*, 415 F.3d at 1312–13.

Petitioner states that Patent Owner contends in the parties’ district-court litigation that no claim language requires express construction and that “Petitioner proposes that the Board apply Patent Owner’s position and not expressly construe any claim language.” Pet. 17. In its comparison of claim element [1(d)] to the asserted prior art, however, Petitioner addresses the claim language “carrier phase rotation,” which we address below. Pet. 32–33.

Patent Owner states that the district court has issued a claim-construction order addressing three elements from claim 1: (1) “the phased array antenna,” (2) “generated from signals received via the phased array antenna,” and (3) “that the preamble is not limiting except for the phrase ‘an electronically steerable phased array antenna comprising a plurality of antenna elements.’” Prelim. Resp. 10.

At this stage, we determine it is unnecessary to construe any terms, but we encourage the parties to directly address issues of claim construction in future briefing. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Discretionary Denial Under 35 U.S.C. § 314

Patent Owner’s Preliminary Response asks the Board to exercise its discretion to deny institution under 35 U.S.C. § 314 in view of parallel litigation. Prelim. Resp. 1–10. However, “the PTAB will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.” Katherine K. Vidal, *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (June 21, 2022), available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf. Petitioner made such a stipulation. Pet. 71. Hence,

we decline to exercise our discretion under § 314 to deny institution in view of parallel litigation.

D. Petitioner's Showings

Petitioner provides a claim-by-claim, limitation-by-limitation comparison of each of claims 1–4, 7–10, 18, 19, and 22 to specific teachings of Williams and Fulton, along with arguments for combining the references' teachings. Pet. 17–68. Petitioner additionally presents comparisons of claims 20 and 21 to the combined teachings of Williams, Fulton, and Trott, along with arguments for combining the references' teachings. Pet. 68–71.

Patent Owner does not substantively address or rebut Petitioner's showings for any of the challenged claims. Below, we review Petitioner's showings for claim 1 as illustrative of Petitioner's assertions.

1. *Claim 1*

- a) *[1(P)] An apparatus for modulating and demodulating signals transmitted and received via an electronically steerable phased array antenna comprising a plurality of antenna elements, the apparatus comprising:*

Petitioner contends Williams teaches the preamble with its disclosures of a base transceiver station (“BTS”) having an electronically steerable adaptive antenna array and four digital signal processors. Pet. 17–20.

According to Petitioner, Williams's BTS modulates and demodulates signals that are transmitted and received by the adaptive antenna array. Pet. 18–19.

- b) *[1(a)] a baseband modulator configured to modulate outbound digital baseband signals to be transmitted via the phased array antenna;*

Petitioner contends Williams teaches that its digital signal processors modulate outbound digital baseband signals which are transmitted by its adaptive antenna array. Pet. 21–23.

- c) *[1(b)] a baseband demodulator configured to demodulate incoming digital baseband signals generated from signals received via the phased array antenna;*

Petitioner contends Williams teaches that its digital signal processors demodulate incoming digital baseband signals received by its adaptive antenna array. Pet. 23–27.

- d) *[1(c)] a shared baseband processor configured to receive digital baseband signals including the modulated outbound digital baseband signals and the incoming digital baseband signals,*

Petitioner contends Williams teaches a digital array processor that processes modulated outbound signals and incoming signals, which are baseband signals. Pet. 27–31.

- e) *[1(d)] said shared baseband processor applying a single phase adjustment to each of the digital baseband signals to jointly account for both beamforming phase rotation and carrier phase rotation of individual antenna elements.*

Petitioner contends Williams teaches that its digital array processor is a shared baseband processor that “applies beamforming phase rotations to signals in both transmit and receive directions and also teaches that this phase rotation is combined (i.e., summed) with a calibration factor such that only a single phase adjustment is made to account for both beamforming and calibration.” Pet. 31. Petitioner argues “a [person of ordinary skill in the art] would have been motivated to supplement *Williams* with the carrier phase rotation disclosed by *Fulton* to correct for carrier phase offset and would have been motivated to implement this phase rotation summed with *Williams*’s beamforming adjustment.” Pet. 31.

Addressing the meaning of the claimed “carrier phase rotation,” Petitioner contends a person of ordinary skill in the art would have understood that the ’141 patent’s specification provides that a baseband demodulator’s phase discriminator measures the difference between the received signal’s carrier phase and the expected carrier phase and provides feedback regarding the difference to a phase accumulator bank. Pet. 32–33. Petitioner states “[a person of ordinary skill in the art] would understand this process of accounting for phase offset is generally referred to as accounting for carrier phase offset (CFO).” Pet. 33.

According to Petitioner, “[a]lthough the Challenged Claims appear to require a carrier phase adjustment in the transmit direction, the ’141 [p]atent does not provide detail about calculating or applying carrier phase rotation in the transmit direction” and a person of ordinary skill would have understood that carrier phase offset is generally accounted for only in the received path and not in the transmit direction. Pet. 33. “That said,” according to Petitioner, “*Fulton’s* disclosed process does perform phase adjustments in both the transmit and receive directions to account for CFO.” Pet. 33; *see* Pet. 36–40.

Petitioner argues a person of ordinary skill would have been motivated to incorporate the functionality of *Fulton’s* rotator in *Williams’s* digital array processor for several reasons. Pet. 40–44; *see* Pet. 36–38. Among other things, Petitioner contends *Williams* and *Fulton* describe similar devices and “a [person of ordinary skill in the art] would have had a reasonable expectation of success in making the proposed combination due to the similarities in their function and architecture.” Pet. 41.

f) Preliminary Conclusion Regarding Claim 1

On the current record, Petitioner has sufficiently shown for the purposes of institution that portions of Williams and Fulton teach or reasonably suggest each limitation of claim 1. Patent Owner will have an opportunity to address Petitioner's showings during the trial stage, but on the current record, we preliminarily determine that Petitioner has shown a reasonable likelihood that it will prevail in its challenge to claim 1 as unpatentable in view of the combined teachings of Williams and Fulton.

2. Claims 2–4, 7–10, 18–22

Petitioner additionally presents contentions comparing each limitation of claims 2–4, 7–10, 18, 19, and 22 to the teachings of Williams and Fulton. Pet. 44–68. Petitioner also presents contentions comparing each limitation of claims 20 and 21 to the teachings of Williams, Fulton, and Trott. Pet. 68–70. On the current record, Petitioner's showings are unrebutted, but Patent Owner will have an opportunity to address Petitioner's showings during the trial stage.

We institute on all claims and all grounds raised in the Petition. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

III. CONCLUSION

For the reasons set forth above, we determine that Petitioner has demonstrated a reasonable likelihood that it will prevail with respect to at least one of claims 1–4, 7–10, and 18–22 of the '141 patent. Accordingly, we institute an *inter partes* review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted as to claims 1–4, 7–10, and 18–22 of the '141 patent on each of the grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '141 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

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