UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,

Petitioner,

v.

APEX BEAM TECHNOLOGIES LLC,

Patent Owner.

Patent No. 11,917,581
Filing Date: September 22, 2022
Issue Date: February 27, 2024

Inventor: Xiaobo Zhang
Title: METHOD AND DEVICE IN UE AND BASE STATION USED FOR PAGING

PATENT OWNER'S PRELIMINARY RESPONSE

Case No. IPR2025-00905

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35 U.S.C. 312(a)(4)..4

Other Authorities

37 C.F.R. § 42.104(b)(4) .... *passim*

LIST OF EXHIBITS

Exhibit No.	Description of Document
2001	Scheduling Order, Dkt. 40, *Apex Beam Techs. LLC v. Apple Inc.*, Case No. 6:24-cv-00223-ADA (W.D. Tex. June 18, 2025)
2002	Apex Beam Technologies LLC's Infringement Contentions and P.R. 3-1 and 3-2 Disclosures in *Apex Beam Techs. LLC v. Apple Inc.*, Case No. 6:24-cv-00223-ADA (W.D. Tex.), dated May 27, 2025
2003	Complaint, Dkt. 1, *Apex Beam Techs. LLC v. Apple Inc.*, Case No. 6:24-cv-00223-ADA (W.D. Tex. April 29, 2024)

I. INTRODUCTION

On May 1, 2025, Apple, Inc. ("Petitioner") submitted a petition (Paper 2, "Petition" or "Pet.") to institute *inter partes* review ("IPR") of U.S. Patent No. 11,917,581 (APPLE-1001, the "'581 Patent"), challenging Claims 1-5, 7-11, 12-17, and 19-23 (the "Challenged Claims"). The Petition asserts that the Challenged Claims are rendered obvious by the Yeo reference (APPLE-1005 or "Yeo"); in view of the TS36 reference (APPLE-1009 or "TS36"); and further in view of the Mallick reference (APPLE-1008 or "Mallick"). Pet. at 1.

The Board should deny the Petition because Petitioner's mapping as to claim limitations 1g and 1h constitutes a failure to comply with Rule 104(b)(4) and fails to show a reasonable likelihood of success. Claim limitation 1g recites "the frequency domain resource used for transmitting the first signaling belongs to a first subband.", and claim limitation 1h recites "the first subband comprises a positive integer number of consecutive subcarriers in frequency domain." For both of these limitations, Petitioner relies extensively on POSITA knowledge to supply missing elements which are not found in the Yeo reference. With respect to claim limitation 1h, Petitioner nests four different POSITA knowledge and "well-known" assumptions to arrive at the claimed requirements. This approach fails to comply with 37 C.F.R. 42.104(b)(4) which requires that a petition for *inter partes* review "must specify where each element of the claim is found in the prior art patents or

printed publications relied upon." Accordingly, the Board should deny institution of the Petition.

II. CLAIM CONSTRUCTION

For the purposes of this Preliminary Response only, Patent Owner believes that claim construction is not required to resolve any issues. Pet. at 19-20.

III. LEVEL OF ORDINARY SKILL IN THE ART

For the purposes of this Preliminary Response only, Patent Owner utilizes Petitioner's proposed level of skill in the art: "bachelor's degree in electrical engineering, computer engineering, computer science, or a similar field, along with two years of experience designing or developing wireless networks." Pet. at 20 (citations omitted).

IV. PETITIONER HAS NOT DEMONSTRATED A REASONABLE LIKELIHOOD OF SUCCESS FOR THE GROUNDS ADVANCED IN THE PETITION, AND THE PETITION SHOULD BE DENIED

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) so-called secondary considerations where in evidence. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole

would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983).

The Board has held that a failure to identify the differences between the claimed subject matter and the prior art is fatal to an obviousness challenge. *See, Apple, Inc. v. Contentguard Holdings, Inc.*, IPR2015-00355, Decision Denying Institution of *Inter Partes* Review, Paper 9 at 9-10 (P.T.A.B. June 26, 2015) (denying institution for failure to identify the differences between the claimed subject matter and the prior art).

In arriving at an obviousness determination, the Board must sufficiently explain and support the conclusions that the prior-art references disclose all the elements recited in the Challenged Claims and a relevant, skilled artisan not only could have made, but would have been motivated to combine all the prior art references in the way the patent claims and reasonably expected success. *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017). That is, even if all the claim elements are found across a number of references, an obviousness determination must consider whether a person of ordinary skill in the art would have the motivation to combine those references. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1368 (Fed. Cir. 2016); *Los Angeles Biomedical Rsch. Inst. at Harbor-UCLA Med. Ctr. v. Eli Lilly & Co.*, 849 F.3d 1049, 1067 (Fed. Cir. 2017) (vacating and remanding an obviousness determination, in part, because

the Board did not make factual finding as to whether there was an apparent reason to combine all three prior art references to achieve the claimed invention and whether a person of skill in the art would have had a reasonable expectation of success from such a combination). This combinability determination, as supported by an articulated motivation to combine, requires a plausible rationale as to why those prior art references would have worked together. *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1335 (Fed. Cir. 2013). Absent some articulated rationale, a "common sense" finding is no different than the conclusory statement "would have been obvious." *In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017). Of additional importance, "knowledge of a problem and motivation to solve it are entirely different from motivation to combine particular references . . . ." *Innogenetics, N.V. v. Abbott Lab'ys*, 512 F.3d 1363, 1373 (Fed. Cir. 2008).

35 U.S.C. 312(a)(3) requires that an IPR petition must identify, "in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim." 35 U.S.C. 312(a)(4) requires that a "petition filed under section 311 may be considered only if . . . the petition provides such other information as the Director may require by regulation." 37 C.F.R. 42.104(b)(4) requires that a petition for inter partes review "must specify where each element of the claim is found in the prior art patents or printed publications relied upon." General knowledge, such as

applicant admitted prior art, expert testimony, common sense, and other evidence, that is not prior art consisting of patents or printed publications may not be used to supply a missing claim limitation. *See* July 31, 2025 Memorandum from Acting Director Stewart Regarding Enforcement and Non-Waiver of 37 C.F.R. 42.104(b)(4). The Board may deny an IPR petition that fails to comply with Rule 104(b)(4). *Id*.

A. The Petition Fails to Show How Yeo Discloses or Renders Obvious Claim Limitation [1h] "the first subband comprises a positive integer number of consecutive subcarriers in the frequency domain"

Claim 1 recites "the first subband comprises a positive integer number of consecutive subcarriers in frequency domain." Petitioner relies only on Yeo for this limitation. Petitioner contends that all claims require this limitation.

Petitioner contends that relevant Yeo teachings include "data or a control channel is transmitted" and "a basic structure of a time-frequency domain that is a radio resource region." Pet. at 40. None of the cited portions identify anything near "the first subband comprises a positive integer number of consecutive subcarriers in frequency domain" and Petitioner fails to articulate how such cited portions disclose the missing elements.

Instead, Petitioner relies on cascading levels of POSITA knowledge to allege disclosure of the elements of this limitation. For example, Petitioner relies on the

statement that "a POSITA would have readily understood that the service-specific subband would include the subcarriers associated with the corresponding OFDM symbols-the subcarriers constituting a positive integer number of consecutive subcarriers in frequency domain." Pet. at 40 (internal quotations marks omitted). With this conclusory statement relied on to plug missing disclosures, Petitioner impermissibly relies on POSITA knowledge and expert testimony alone to account for missing elements which are not disclosed in the Yeo reference.

Petitioner further alleges that the portion of the POSITA knowledge related to "PDCCH is transmitted in a service-specific subband" is actually found in claim limitation 1g. As further described below, this allegation is also based purely on POSITA knowledge.

The Board should deny the Petition because this mapping is impermissible and constitutes a failure to comply with Rule 104(b)(4). As submitted, Petitioner has failed to show a reasonable likelihood of success.

B. The Petition Fails to Show How Yeo Discloses or Renders Obvious Claim Limitation [1g] "the frequency domain resource used for transmitting the first signaling belongs to a first subband"

Claim 1 recites "the frequency domain resource used for transmitting the first signaling belongs to a first subband." Petitioner relies only on Yeo for this limitation. Petitioner contends that all claims require this limitation.

Petitioner admits that Yeo discloses that the alleged frequency domain resource for the PDDCH does not "belong to a first subband," as required by the claims, and is instead spread over Yeo's entire system transmission bandwidth. Pet. 36-37.

Petitioner admits that Yeo discloses various types of UEs and types of communications. Pet. at 37. Thus care must be taken to determine which embodiment is being mapped to the claims. Rather than make clear which embodiment or alleged combination of embodiments Petitioner is relying upon, Petitioner uses all embodiments together to advance multiple impermissible "well-known" allegations to supply this missing limitation. Pet. at 38 (excerpted below).

> It was well known as of the Critical Date that "a downlink (DL) means a radio transmission path of a signal transmitted from a base station to a terminal," and a "Master information block (MIB)…includes…[i]nformation on downlink cell bandwidth." APPLE-1005, 18:56-57, 45:29-35; APPLE-1006, [0182], [0391-[0394]. It was also well-known as of the Critical Date that downlink information is transmitted over DL transport channels which could include "a Broadcast Channel (BCH), Downlink Shared Data Channel (DL-SDCH) and a Paging Channel (PCH)." APPLE-1021, [0043]; APPLE-1003, 87.

Petitioner gift-wraps these unsupportable "well-known" arguments with further unsupportable POSITA knowledge that contradicts Petitioner's initial admission that Yeo discloses the entire transmission bandwidth instead of the claimed first subband. Pet. at 39. Specifically, Petitioner contends that a POSITA

would have known that a specific subband 1d-06 may include certain DL transport channels including PCH and that this specific subband would host paging transmissions and receptions. However, this does not comport with Petitioner's initial admission that Yeo discloses the entire transmission. In other words, Petitioner's allegation of POSITA knowledge, which is used to supply the missing requirements, would necessitate the addition of content to the disclosure of Yeo. The Board should deny the Petition because this mapping is impermissible and constitutes a failure to comply with Rule 104(b)(4). As submitted, Petitioner has failed to show a reasonable likelihood of success.

V. CONCLUSION

For the foregoing reasons, Patent Owner respectfully requests that the Board deny institution of the Petition in its entirety.

Respectfully submitted,

Dated: September 9, 2025

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned PATENT OWNER'S PRELIMINARY RESPONSE has 1,635 words in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24. This word count was prepared using Microsoft Word for Office 365.

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CERTIFICATE OF SERVICE

A copy of the foregoing PATENT OWNER'S PRELIMINARY RESPONSE has been served on Petitioner's counsel of record as follows:

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