

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC., and NOKIA OF AMERICA CORPORATION,
Petitioners,

v.

ACTIVE WIRELESS TECHNOLOGIES LLC,
Patent Owner.

IPR2024-00985
Patent 10,601,566 B2

Before MONICA S. ULLAGADDI, DAVID COTTA, and
JASON M. REPKO *Administrative Patent Judges*.

COTTA, *Administrative Patent Judge*

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

I. INTRODUCTION

Ericsson Inc. and Nokia of America Corp. (collectively “Petitioner”) filed a Petition to institute an *inter partes* review (“IPR”) of claims 8–14 and 16 (the “challenged claims”) of U.S. Patent No. 10,601,566 B2 (“the ’566 patent”). Paper 1 (“Petition” or “Pet.”). Active Wireless Technologies LLC (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”).

Under 35 U.S.C. § 314(a), *inter partes* review may not be instituted unless the Petition “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” Institution of an *inter partes* review is discretionary. *See* 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances).

Patent Owner argues that the Board should exercise its discretion to deny institution in view of parallel district court litigation Prelim. Resp. 16–23 (citing *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). The Board applies the *Fintiv* factors to determine whether to deny the petition for that reason. *See Fintiv*, Paper 11 at 5–6.

The Board will not discretionarily deny institution under the *Fintiv* factors when a petition presents “compelling evidence of unpatentability.” *CommScope Techs. LLC v. Dali Wireless, Inc.* IPR2022-01242, Paper 23 at 3 (Vidal Feb. 27, 2023) (precedential) (citing Katherine K. Vidal, Director of the USPTO, *Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation*, 5 (June 21, 2022)

(“Guidance Memo”)).¹ The compelling-merits standard is higher than the reasonable-likelihood standard for institution. *CommScope*, Paper 23 at 3 (citing Guidance Memo, 4–5; *OpenSky Indus., LLC v. VLSI Tech. LLC*, IPR2021-01064, Paper 102 at 49–50 (PTAB Oct. 4, 2022) (precedential)).

For the reasons discussed below, the Petition presents compelling evidence of unpatentability for all challenged claims. Thus, we institute an *inter partes* review.

A. Real Parties-in-Interest

Petitioner identifies Ericsson Inc., Telefonaktiebolaget LM Ericsson, and Nokia of America Corporation as the real parties-in-interest. Pet. 69. Petitioner also identifies T-Mobile USA, Inc., AT&T Services Inc., AT&T Mobility LLC, and Cellco Partnership d/b/a Verizon Wireless as potential real parties in interest because “Petitioners’ products provided to these entities have been accused of infringement.” *Id.* at 70. Patent Owner identifies itself, Active Wireless Technologies LLC, as the real party-in-interest. Paper 6, 2.

B. Related Matters

The parties identify as a related matter the following lawsuits involving the ’566 patent (and other patents): *Active Wireless Technologies LLC v. T-Mobile USA, Inc., et al.*, Case No. 2:23-cv-00261-JRG (E.D. Tex.) (“the Related Litigation”) and *Active Wireless Technologies LLC v. Verizon*

¹ https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621.pdf

Communications, Inc., et al., Case No. 2:23-cv-00620-JRG (E.D. Tex.).²
Pet. 73; Paper 6, 2.

C. The '566 Patent

The '566 patent is titled “Multiple Slot Long Physical Uplink Control Channel (PUCCH) Design for 5th Generation (5G) New Radio (NR).” Ex. 1001, code (54). The '566 patent issued from an application filed Aug. 9, 2018. *Id.* at code (22). The '566 patent further claims priority to a PCT application filed on Aug. 8, 2018 and to a provisional application filed on Aug. 10, 2017. *Id.* at codes (60), (63).

According to the '566 patent, “[a]s wireless communication devices have advanced, improvements in communication capacity, speed, flexibility, and/or efficiency have been sought.” Ex. 1001, 1:35–37. The '566 patent identifies the problem that the communication structure used by wireless communication devices to communicate with one or more devices “may only offer limited flexibility and/or efficiency.” *Id.* at 1:42–43. The '566 patent asserts that its systems and methods “improve communication flexibility and/or efficiency.” *Id.* at 1:43–45.

The '566 patent discloses user equipment (UE) that includes a processor and memory, where “[i]nstructions stored in the memory are executable to determine an uplink control channel (PUCCH) spans over multiple slots based on a signaling from a base station (gNB).” *Id.* at 3:1–8. “The instructions are further executable to determine a frequency hopping method of the configured multi-slot PUCCH” and to “determine uplink

² Because the Docket Control Order for Case No. 2:23-cv-00620 is not of record, and because the parties assert that the earliest scheduled trial date is for Case No. 2:23-cv-00261, we focus our *Fintiv* analysis on Case No. 2:23-cv-00261. *See infra* § II.

control information (UCI) encoding and loading methods on the configured mutli-slot PUCCH.” *Id.* at 3:10–16.

The ’566 patent discloses that “[t]he number of PUCCH symbols in each slot of a multi-slot control channel (PUCCH) may be greater than or equal to 4.” *Id.* at 3:19–21. In addition, “[t]he number of PUCCH symbols may be the same in each slot of a multi-slot uplink control channel (PUCCH), and the same PUCCH symbol location may be allocated in each slot.” *Id.* at 3:24–26.

D. Challenged Claims

The ’566 patent includes 16 claims. Petitioner challenges claims 8–14, and 16. Claims 8 and 16 are the only independent claims among the challenged claims. Claim 8 is illustrative of the subject matter of the challenged claims and is reproduced below.³

8. **[8.0]** A base station (gNB), comprising:
 [8.1] a processor; and
 memory in electronic communication with the processor,
wherein instructions stored in the memory are executable to:
 [8.2] transmit, to a user equipment (UE), a signaling, an
uplink control channel (PUCCH) spans over multiple slots
being determined based on the signaling; and
 [8.3] receive uplink control information (UCI) with the
frequency hopping for the configured multiple slots PUCCH,
wherein
 [8.4] the number of symbols of the PUCCH is the same
in each slot of the multiple slots, and
 the location of the symbols for the PUCCH is the same in
the each slot of the multiple slots.

Ex. 1001, 46:15–30 (bracketing added for reference purposes).

³ Claim 16 is similar to claim 8 but is directed to a “method by a base station” rather than to a “base station.”

E. Asserted Grounds of Unpatentability

Petitioner asserts that claims 8–14 and 16 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ⁴	Reference(s)/Basis
8–11, 13, 14, 16	103	Kim, ⁵ Gao ⁶
12	103	Kim, R1-1710555 ⁷
12	103	Kim, Gao, Huang ⁸

Petitioner relies on the declaration of Dr. Mark P. Mahon (Ex. 1003) among other evidence.

II. EXERCISE OF DISCRETION

Institution of an *inter partes* review is discretionary. *See* 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018).

⁴ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. §§ 102, 103 effective March 16, 2013. The earliest date to which ’566 patent claims priority is August 10, 2017. Ex. 1001 (60). Because that date falls after the effective date of the applicable AIA amendments, we apply the AIA version of § 103 here.

⁵ Kim et al., U.S. Patent Application Publication No. 2019/0159191 A1, published May 23, 2019 (Ex. 1004, “Kim”).

⁶ Gao, U.S. Patent No. 10,951,350 B2, issued Mar. 16, 2021 (Ex. 1005, “Gao”).

⁷ Intel Corporation, 3GPP submission, *Long PUCCH Over Multiple Slots*, dated June 27–30, 2017 (Ex. 1011, “R1-1710555”).

⁸ Huang et al., U.S. Patent No. 10,873,435 B2, issued Dec. 22, 2020 (Ex. 1016, “Huang”).

In the Preliminary Response, Patent Owner contends that we should exercise our discretion to deny the Petition because the Related Litigation will likely to be completed months before a Final Written Decision in this proceeding. Prelim. Resp. 16–23.

When determining whether to exercise discretion to deny institution in view of a parallel proceeding, we consider the following factors:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). “These factors relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* In evaluating these factors, we “take[] a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* at 6. We consider each of these factors below.

On June 21, 2022, the Director of the United States Patent and Trademark Office issued a Memorandum setting forth an “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation” (“Guidance Memo”). The Guidance Memo states that “to benefit the patent system and the public good, the PTAB will not

rely on the *Fintiv* factors to discretionarily deny institution in view of parallel district court litigation where a petition presents compelling evidence of unpatentability.” *Id.* at 2. “Compelling, meritorious challenges are those in which the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Id.* at 4.

With these *Fintiv* factors and the Director’s guidance in mind, we consider the parties’ contentions.

In the analysis that follows, we first consider whether *Fintiv* factors 1–5 weigh in favor of exercising our discretion to deny institution. For the reasons discussed below, we conclude that *Fintiv* factor 1 is neutral, factors 2, 3, and 5 weigh in favor of denial, and factor 4 weighs marginally against discretionary denial. On balance, the *Fintiv* factors weigh in favor of denying institution. Because the *Fintiv* factors favor denial of institution, we must also determine whether the Petition presents compelling merits. *See CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4 (PTAB Feb. 27, 2023) (precedential) (“In circumstances where . . . the Board’s analysis of *Fintiv* factors 1–5 favors denial of institution, the Board shall then assess compelling merits.”).

1. *Likelihood of a Stay (Factor 1)*

Fintiv factor 1 recognizes that a stay of litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts, which strongly weighs against exercising the authority to deny institution. *Fintiv*, Paper 11 at 6.

Petitioner argues that this factor is neutral, asserting that “no request for stay has been filed.” Pet. 67. Patent Owner asserts that “a motion for a stay by Petitioner has already been denied.” Prelim. Resp. 21 (citing Dkt. 68

(Ex. 2006) in the Related Litigation). Both parties paint a somewhat incomplete picture of what has transpired in the Related Litigation with respect to a stay. In fact, Judge Gilstrap denied Petitioner’s Motion to Stay without prejudice on the basis that it was premature. Ex. 2006. Judge Gilstrap’s decision expressly permits Petitioner leave to refile its Motion “within fourteen (14) days following the Board’s last institution decision.” *Id.* at 3. Accordingly, the possibility of a stay remains open.

Absent specific evidence, the Board, typically, “will not attempt to predict how the district court in the related district court litigation will proceed because the court may determine whether or not to stay any individual case . . . based on a variety of circumstances and facts beyond our control and to which the Board is not privy.” *Sand Revolution II LLC v. Cont’l Intermodal Grp.*, IPR2019-01393, Paper 24, 7 (PTAB June 16, 2020) (informative). We decline to speculate on how the court may rule on a motion for a stay should one be filed. Accordingly, this factor is neutral.

2. *Proximity of Trial Date to Projected Deadline (Factor 2)*

Fintiv factor 2 looks to the “proximity of the court’s trial date to the Board’s projected statutory deadline.” *Fintiv*, Paper 11 at 9. The Board’s projected statutory deadline for reaching a final written decision in this matter is in December 2025. The earliest scheduled trial date in the Related Litigation is March 17, 2025. Ex. 2001, 1.⁹ Because the scheduled trial date substantially predates the expected date of our final written decision, this factor weighs in favor of denial. *See e.g., Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, 13 (PTAB May 13, 2020) (informative)

⁹ Neither party introduces evidence of current median time to trial statistics for the Eastern District of Texas.

(“Because the currently scheduled District Court trial is scheduled to begin two months before our deadline to reach a final decision, this factor weighs somewhat in favor of discretionary denial in this case.”); *Edward LifeSciences Corp. v. Evalve, Inc.*, IPR2019-01479, Paper 7, at 6–13 (PTAB Feb. 26, 2020) (denying institution where jury trial would conclude more than nine months before a final decision would be due); *Samsung Elecs. Am., Inc. v. Uniloc 2017 LLC*, IPR2019-01218, Paper 7, at 7–10 (PTAB Jan. 7, 2020) (denying institution where jury selection was scheduled for approximately six months before trial in the Board proceeding would conclude).

3. *Investment in the Parallel Proceeding (Factor 3)*

Fintiv factor 3 considers the “investment in the parallel proceeding by the court and parties,” including “the amount and type of work already completed in the parallel litigation by the court and the parties at the time of the institution decision.” *Fintiv*, Paper 11 at 9. For example, if, at the time of institution, the court in the parallel proceeding has issued “substantive orders related to the patent at issue in the petition” or “claim construction orders” this favors denial. *Id.* at 9–10.

Petitioner asserts in its Petition that “the Related Litigation is in its early stages, and the investment in it has been minimal at this time.” Pet. 67. In addition, Petitioner asserts that it “diligently prepared this Petition and filed in advance of the statutory deadline, which weighs further against denying institution.” *Id.* at 68. Thus, according to Petitioner, “[f]actor 3 heavily favors institution.” *Id.* at 67.

Patent Owner responds that “[t]he parties’ investment in the parallel proceeding weighs in favor of discretionary denial.” Prelim. Resp. 21. According to Patent Owner, the district court has already issued several

orders, and “[d]iscovery is . . . well under way.” *Id.* Patent Owner, thus, asserts that “the parties’ and Court’s substantial investment in this proceeding weighs in favor of denial of institution.” *Id.*

We agree with Patent Owner that the existing investment by the parties and the court in the Related Litigation has been substantial. Discovery in the Related Litigation has closed. Ex. 2001, 4 (Docket Control Order listing the deadline for completion of fact discovery as October 11, 2024, and the deadline for completion of expert discovery as December 4, 2024). In addition, the deadline for filing dispositive motions and *Daubert* motions has passed. *Id.* (listing the deadline for filing such motions as December 9, 2024). Although work remains in the lead-up to trial before the district court, we find that this factor favors exercising our discretion to deny institution.

Petitioner’s argument that its diligence weighs in favor of institution is weak. Petitioner does not explain how it was diligent or even identify the time period during which it contends it was diligent. For example, Petitioner does not present argument or evidence on whether it was diligent from: the date suit was filed against its customer, the date it received notice of such suit, the date it moved to intervene in the suit against its customer, the date it received infringement contentions, or some other date. Absent argument or evidence supporting Petitioner’s diligence, we are not persuaded that filing the Petition “in advance of the statutory deadline” weighs against discretionary denial.

4. *Overlap of Issues (Factor 4)*

Fintiv factor 4 considers whether “the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding.” *Fintiv*, Paper 11 at 12. If the issues in

the Petition overlap substantially with those raised in the parallel proceeding, “this fact has favored denial.” *Id.* “Conversely, if the petition includes materially different grounds, arguments, and/or evidence . . . this fact has tended to weigh against exercising discretion to deny institution.” *Id.* at 12–13.

Here, Petitioner stipulates that it “will not pursue invalidity against the asserted claims in the district court using the specific combination of prior art references set forth in the grounds presented in this Petition for purposes of establishing obviousness.” Pet. 68. Patent Owner asserts that the same claims are at issue here as in the Related Litigation and that institution would “duplicate effort” and be an “inefficient use of Board, party, and judicial resources.” Prelim. Resp. 19. Patent Owner also asserts that institution would “raise[] the possibility of conflicting decisions.” *Id.* Additionally, Patent Owner asserts that an IPR, if instituted, “would only cover 5 out of at least 11 combinations of obviousness that Petitioner has raised in the District Court Litigation, and [would] not include Petitioner’s challenges under § 101, § 102, or § 112.” *Id.* at 22.

The Board’s informative decision in *Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC* expressed skepticism that stipulations like the one at issue here achieve the goals of avoiding duplication and inconsistent decisions:

Petitioner *could have stipulated* that it would not pursue any ground raised or that *could have been reasonably raised* in an IPR, i.e., any ground that could be raised under §§ 102 or 103 on the basis of prior art patents or printed publications. *A broader stipulation of that nature, not at issue here, might better address concerns regarding duplicative efforts and potentially conflicting decisions in a much more substantial way.* Likewise, such a stipulation might help ensure that an IPR

functions as a true alternative to litigation in relation to grounds that could be at issue in an IPR. Further still, Petitioner could have expressly waived in the district court any overlapping patentability/invalidity defenses. Doing so might have tipped this factor more conclusively in its favor.

IPR2019-01393, Paper 24 at 12 n.5 (PTAB June 16, 2020) (informative) (emphasis added). The Board in *Sand Revolution* accorded a stipulation not containing the “could have reasonably raised” provision “marginal[]” weight. *Id.* at 12.

Petitioner’s stipulation does reduce somewhat the overlap relating to the challenge presented in the Petition, but not as fully as would a *Sotera*-type stipulation. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB Dec. 1, 2020) (precedential) (addressing a stipulation to not pursue in court any grounds raised or that reasonably could have been raised in the IPR); Guidance Memo, 7–8 (explaining that institution will not be discretionarily denied due to parallel litigation where a *Sotera*-type stipulation is made). Accordingly, consistent with the decision in *Sand Revolution*, we find that Petitioner’s stipulation weighs only marginally against discretionary denial. *Id.* (determining that stipulation similar to that here weighed “marginally” against discretionary denial).

Overall, we find that this factor weighs marginally against exercising our discretion to deny institution.

5. *Identity of Parties (Factor 5)*

Petitioner is an intervenor/defendant in the Related Litigation. Pet. 69. To the extent that trial in the district court may precede the deadline for a final written decision in this proceeding, this factor favors exercising our discretion to deny institution. *Huawei Tech. Co. v. WSOU Inv., LLC*, IPR2021-00225, Paper 11 at 14 (PTAB June 14, 2021) (finding that “this

factor favors denial if trial precedes the Board’s Final Written Decision and favors institution if the opposite is true”) (internal quotation marks omitted); *Google LLC v. Parus Holdings, Inc.*, IPR2020-00846, Paper 9 at 21 (PTAB Oct. 21, 2020) (“Here, . . . Petitioner is the defendant in the parallel proceeding. This fact could weigh either in favor of, or against, exercising discretion to deny institution, depending on which tribunal was likely to address the challenged patent first.”). As discussed *supra* § II.B.2, trial in the district court is likely to precede our final written decision. Accordingly, this factor weighs in favor of exercising our discretion to deny institution.

6. *Other Circumstances Including the Merits (Factor 6)*

We take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review” when evaluating these factors. *Fintiv*, Paper 11 at 6. We have considered the circumstances and facts before us in view of *Fintiv* factors 1–5. As discussed above, factor 1 is neutral, factors 2, 3, and 5 weigh in favor of discretionary denial of institution, and factor 4 weighs marginally against discretionary denial. On balance, we conclude that the evidence of record on factors 1–5 favors exercising our discretion to deny institution of an *inter partes* review.

Following *CommScope*, where, as here, our analysis of the first five *Fintiv* factors favors denial of institution, we address the merits of the Petition to determine whether, on this preliminary record, the merits are compelling. *CommScope*, IPR2022-01242, Paper 23 at 4–5; Guidance Memo 3–5.

III. COMPELLING MERITS ANALYSIS

A. *Legal Principles*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3)).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed invention and the prior art are such that the claimed invention would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the relevant art. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). 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 ordinary skill in the art; and (4) objective indicia of nonobviousness when presented. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Moreover, when assessing obviousness based on the combined teachings of multiple references, “[a]n obviousness determination requires finding both that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *CRFD Rsch., Inc. v. Matal*, 876 F.3d 1330, 1340 (Fed. Cir. 2017) (internal quotation marks and citation omitted).

“Compelling, meritorious challenges are those in which the evidence, if unrebutted at trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” Guidance Memo, 4. Compelling, meritorious challenges have a more than reasonable

likelihood of showing that a claim is unpatentable by a preponderance of the evidence. *OpenSky*, Paper 102 at 49–50. “A challenge can only ‘plainly lead to a conclusion that one or more claims are unpatentable’ . . . if it is highly likely that the petitioner would prevail with respect to at least one challenged claim.” *Id.* at 49.

B. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art (“POSA” or “POSITA”) would have been “familiar with wireless communications networks, equipment, and integrated circuit chips, and would have had at least a working knowledge of communication protocols used in LTE and 5G radio access networks (“RAN”).” Pet. 11–12. According to Petitioner, a POSA would have “at least a Bachelor’s degree in Electrical Engineering or an equivalent field, and at least two years of work experience in design, development, and/or testing wireless telecommunication systems” as well as “familiarity with the wireless standards and protocols related to data transmission and network management.” *Id.* at 12. At this stage in the proceeding, Patent Owner does not contest Petitioner’s definition of the POSA. Prelim. Resp. 10 (“For purposes of this Preliminary Response only, Patent Owner utilizes Petitioner’s proposed level of skill in the art.”).

Because Petitioner’s description of a POSA appears consistent with the subject matter of the ’566 patent and with the prior art of record and we apply it for purposes of this decision, with the exception of the qualifier “at least” which expand the ranges of education and experience indefinitely with no upper bound. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

C. Claim Construction

We interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

Petitioner proposes that, for purposes of this proceeding, “each claim term be given its plain and ordinary meaning.” Pet. 11.

Patent Owner points out that, in the Related Litigation, Petitioner proposed construing several claim terms, and the parties ultimately agreed on constructions for these terms. Prelim. Resp. 5; Ex. 3002, 6 (Claim Construction Order in the Related Litigation). Patent Owner then argues that, by failing to advance the parties’ agreed-upon claim constructions, Petitioner failed in its duty to explain “how the challenged claim is to be construed.” Prelim. Resp. 6 (citing 37 CFR § 42.104(3)). Finally, Patent Owner asserts that Petitioner did not apply the parties’ agreed-upon claim constructions in the Petition. *Id.*

We find Patent Owner’s argument that Petitioner did not meet its obligation to explain how the claims should be construed unavailing because, on the present record, we do not find a material difference between Petitioner’s assertion in this proceeding that the claims should be given their plain and ordinary meaning and the claim constructions that Petitioner agreed to in the district court litigation. We do not find it necessary to expressly construe any claim terms at this stage of the proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe 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)); *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy’”). We address whether the Petitioner has sufficiently shown that the cited art meets the limitations at issue *infra* § III.E.1.

*D. Overview of the Kim (Ex. 1004)*¹⁰

Kim is a U.S. patent application, published on May 23, 2019 and claiming priority from PCT/KR2017/006813, filed on June 28, 2017. Ex. 1004, codes (22) (43). Petitioner contends that Kim is prior art under 35 U.S.C. § 102(a)(2). Pet. 17. At this stage in the proceeding, Patent Owner does not contest the prior-art status of Kim. *See generally* Prelim. Resp.

Kim discloses “a method for transmitting/receiving an uplink signal between a base station and a terminal, and a device for supporting the same.” Ex. 1004, code (57). In Kim’s method, “a UE receives information from an eNB [base station] on a DL [DownLink] and transmits information to the eNB on a UL [UpLink].” *Id.* ¶ 59. Kim teaches that “[c]ontrol information that the UE transmits to the eNB is generically called Uplink Control Information (UCI).” *Id.* ¶ 67. “The UCI includes a Hybrid Automatic Repeat and reQuest Acknowledgement/Negative Acknowledgement (HARQ-ACK/NACK), a Scheduling Request (SR), a Channel Quality Indicator (CQI), a Precoding Matrix Index (PMI), a Rank Indicator (RI),

¹⁰ Although the Petition also relies on Gao, R1-1710555, and Huang as prior art in its challenge, we focus our analysis on Kim because Petitioner relies solely on Kim for claim limitations in dispute. Pet. 31–33.

etc.” *Id.* “UCI is generally transmitted on a PUCCH periodically”; however, if transmitted simultaneously with traffic data, or “upon receipt of a request/command from a network,” UCI may be transmitted on a PUSCH (physical uplink shared channel). *Id.* ¶ 68.

Kim discloses that “[t]he region in which the long PUCCH is transmitted can be configured via DCI [Downlink Control Information carried on a physical downlink common channel PDCCH] (e.g., DL assignment or higher layer signaling).” *Id.* ¶ 228. “In this case, the DCI or higher layer signaling . . . may include . . . [t]he location of a symbol(s) that should be emptied per TTI [Transmission Time Interval]” and/or “[s]pecific frequency resources in the symbol(s) that should be emptied per TTI.” *Id.* ¶¶ 228–230; *see also id.* ¶ 235 (“information about a time when frequency hopping is applied to . . . a long PUCCH and/or information about a frequency hopping interval may be configured/indicated via DCI or higher layer signaling”). Kim also discloses that the “number of slots where a long PUCCH (PUSCH or PDSCH) is transmitted and indices thereof can be determined by RRC signaling, first layer (e.g., PHY, L1) signaling, or a combination thereof.” *Id.* ¶ 244. And Kim discloses that a “time/frequency resource candidate where UCI will be actually transmitted may be defined per format by higher layer signaling, and the locations of the resources that will be actually used among the UCI resources may be dynamically indicated by the DCI that schedules multiple TTIs.” *Id.* ¶ 287.

E. Analysis of Ground 1

In our compelling merits analysis, we focus on claim 8 because Petitioner’s showing for all three Grounds and all of the challenged claims depends on its showing for independent claim 8. More specifically, we

focus on Petitioner's mapping for limitations 8.2 and 8.3 because, at this stage, those are the only limitations that Patent Owner disputes as not being disclosed or suggested by Kim..

Claim limitation 8.2 requires that the base station comprise memory with instructions that are executable to “transmit, to a user equipment (UE), a signaling, an uplink control channel (PUCCH) spans over multiple slots being determined based on the signaling.” Ex. 1001, 46:20–24. Petitioner identifies several of Kim's disclosures as having the capacity to configure a PUCCH. First, Petitioner identifies “DCI/L1 signaling” as corresponding to the claimed signaling, stating “Kim discloses a base station that is configured to transmit downlink control information (DCI/L1 signaling) (*signaling*) to the UE for configuring the PUCCH.” Pet. 31. Petitioner also indicates that “DL assignment or higher layer signaling” may correspond to the claimed signaling. *Id.* (“The number of symbols per slot of the long PUCCH can be determined based on the signaling (e.g., DL assignment of higher layer signaling).”). Finally, Petitioner quotes disclosures from Kim that teach that the long PUCCH can be “configured via DCI (e.g., DL assignment or higher layer signaling)” and that the configuration of a long PUCCH can be “determined by RRC signaling, first layer (e.g., PHY, L1) signaling, or a combination thereof.” *Id.* (quoting Ex. 1004 ¶¶ 228, 242) (emphasis omitted). Thus, according to Petitioner, Kim discloses that a PUCCH can be configured by: DCI/L1 signaling, DL assignment, higher layer signaling, RRC signaling, first layer (e.g., PHY/L1) signaling, or a combination of signals. *Id.*

Claim limitation 8.3 requires that the base station comprise memory with instructions that are executable to “receive uplink control information (UCI) with frequency hopping for the configured multiple slots PUCCH.”

Ex. 1001, 46:24–26. There does not appear to be any dispute that “the configured multiple slots PUCCH” recited in claim limitation 8.3 is the same PUCCH that “spans over multiple slots” and is “determined based on the signaling” in limitation 8.2. Ex. 2005, 2 (Joint Claim Construction and Prehearing Statement reflecting the parties’ agreed-upon constructions in the Related Litigation); Ex. 3002, 6 (district court Claim Construction Order also reflecting the parties’ agreed-upon constructions).

Petitioner contends that the PUCCH that meets limitation 8.3 is configured based on “the DCI (e.g. Layer 1) or higher layer signaling.” Pet. 32 (stating that “Kim discloses that frequency hopping may be applied to the PUCCH based on the DCI (e.g. Layer 1) or higher layer signaling from the base station” and quoting Kim’s disclosure that “a long PUCCH and/or information about a frequency hopping interval may be configured/indicated via DCI or higher layer signaling”) (quoting Ex. 1004 ¶ 235) (emphasis omitted).

Patent Owner argues that “the Petition is deficient because the Petitioner inconsistently maps different disclosures in Kim to claim elements [8.2] and [8.3].” Prelim. Resp. 13. More specifically, Patent Owner argues that, for claim element 8.2, “the Petition relies on Kim’s RRC and/or first layer signaling for the claimed ‘signaling,’ while for claim element [8.3], the Petition relies on Kim’s disclosure of DCI or higher layer signaling for the claimed ‘signaling.’” *Id.* Patent Owner asserts that RRC and/or first layer signaling is “not necessarily the same” as DCI or higher layer signaling. *Id.*

Patent Owner’s argument is premised on construing limitations 8.2 and 8.3 to require that the signaling used to determine the “span over multiple slots” in Kim’s PUCCH be the same as the signaling used to configure frequency hopping. Prelim. Resp. 13. On this preliminary record,

Patent Owner does not explain why the claim should be construed to require that the signaling transmitted to the user equipment to determine “an uplink control channel (PUCCH) spans over multiple slots” in connection with limitation 8.2 must also be used in limitation 8.3, which requires that the base station “receive uplink control information (UCI) with frequency hopping information” for the PUCCH. Although it is clear that the parties agree that claim limitations 8.2 and 8.3 should be construed such that the PUCCH in claim elements 8.2 and 8.3 is the same (Ex. 2005, 2; Ex. 3001, 6), it is not clear whether Petitioner agrees with Patent Owner that the claims require identity of signaling because the Petition does not address the issue (Pet. 11, 31–33 (addressing claim construction and limitations 8.2 and 8.3 without addressing identity of signaling)). We need not address this potential issue here because the preliminary record supports that the Kim discloses that same signal can be used for both requirements. That is, Kim discloses limitation 8.2 and 8.3 even under Patent Owner’s implicit claim construction.¹¹

As discussed above Petitioner cites DCI signaling for limitation 8.2 and limitation 8.3. Pet. 31–32. Petitioner’s citations to Kim support its assertion that DCI signaling may be used to determine PUCCH “spans over multiple slots.” See, e.g., Ex. 1004 ¶ 228 (“The region in which the long PUCCH is transmitted can be configured via DCI (e.g., DL assignment or higher layer signaling”) (cited at Pet. 31). Similarly, Petitioner’s citations to Kim support its assertion that DCI signaling may be used to configure frequency hopping for the PUCCH. *Id.* ¶ 235 (“Additionally, information

¹¹ To the extent Patent Owner maintains its implicit claim construction argument at trial, Patent Owner should brief the issue.

about a time when frequency hopping is applied to such a long PUCCH and/or information about a frequency hopping interval may be configured/indicated via DCI or higher layer signaling. ”)(cited at Pet. 32). Accordingly, we are not persuaded by Patent Owner’s argument that Petitioner inconsistently maps limitations 8.2. and 8.3.

We recognize that the Petition identifies some signals in connection with limitation 8.2 that it does not identify in connection with limitation 8.3. This does not significantly diminish Petitioner’s showing, even under Patent Owner’s implicit claim construction, at least because, on this preliminary record, Petitioner’s DCI signaling citations do not appear to be derived from disparate disclosures and/or embodiments. Patent Owner argues that “the Petition points to a separate, and possibly uncorrelated signaling” for limitations 8.2 and 8.3 (Pet. 13), but Kim’s teaching that DCI signaling can be used to determine PUCCH location appears to be correlated with its teaching that DCI can be used to determine and frequency resources (*see e.g.*, Ex. 1004 ¶¶ 228–230 (disclosing that the “region in which the PUCCH is transmitted can be configured via DCI” and that “DCI or higher layer signaling for the long PUCCH may include . . . [t]he location of a symbol(s) that should be emptied per TTI [time transmission interval] . . . [and s]pecific frequency resources in the symbol(s) that should be emptied per TTI . . . when the long PUCCH is transmitted over multiple TTI”)).

Other than the arguments discussed above, Patent Owner does not present arguments specifically directed to the other limitations of claim 8. *See* Prelim. Resp. Nor does Patent Owner present separate arguments for claims 9–11, 13, 14, and 16. Rather, Patent Owner argues that Petitioner has not shown that claims 9–11, 13, 14, and 16 are unpatentable for the same reasons as claim 8. *Id.* at 16.

Even so, Petitioner has the burden to show that the challenged claims are unpatentable. Thus, we have reviewed Petitioner's arguments and evidence submitted in connection with the remaining limitations of claim 8 and in connection with claims 9–11, 13, 14, and 16. For the reasons explained by Petitioner, we find them to be sufficient at this stage and on this record.

F. Analysis of Grounds 2 and 3

Claim 12 depends from claim 8 and additionally requires that “the frequency hopping is applied at slot boundaries in the multiple slots PUCCH.” Ex. 1001, 46:45–46.

In Ground 2, Petitioner contends that Kim discloses inter-slot hopping and that this meets the additional requirements of claim 12. Pet. 56 (citing Ex. 1004 ¶¶ 235–236). In addition, Petitioner contends that, to the extent Kim does not disclose the additional requirements of claim 12, R1-1710555 discloses these requirements by showing frequency hopping that occurs “at the slot boundary of each slot.” Pet. 56–57 (citing Ex. 1011, Fig. 2(a)). According to Petitioner, it would have been obvious to frequency hop in this manner because the POSA would have understood that inter-slot frequency hopping increases frequency diversity and improves reliability in the transmission. *Id.* at 57 (citing Ex. 1003 ¶ 173).

In Ground 3, Petitioner contends that, to the extent Kim does not disclose the additional requirements of claim 12, Huang does so with its disclosure that “frequency of a PUCCH may be changed within a subframe across a time slot boundary, e.g., between the first and second time slots at the border of subframe 4 and subframe 5.” Pet. 61–62 (citing Ex. 1016, 16:4–13; Ex. 1017 ¶¶ 60–62). Petitioner contends the POSA would have

found motivation to modify Kim’s techniques with Huang’s teaching for “the benefit of achieving frequency diversity.” Pet. 60 (citing Ex. 1016:35–37; Ex. 1017 ¶ 61; Ex. 1003 ¶ 177).

Patent Owner does not present arguments specifically directed to Grounds 2 or 3 and/or to the additional requirements claim 12. *See* Prelim. Resp. We have reviewed Petitioner’s arguments and evidence submitted in connection with claim 12. For the reasons explained by Petitioner, we find them to be sufficient at this stage and on this record.

G. Conclusion on Compelling Merits

For the reasons set forth above, we determine that Grounds 1–3 of the Petition present a compelling meritorious challenge. That is, “the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” Guidance Memo 4. As the Director explains in *OpenSky*, however, this finding “should not be taken as a signal to the ultimate conclusion after trial” because “all relevant evidence likely will not have been adduced at the point of institution [and] trial should produce additional evidence that may support a determination in the Final Written Decision that unpatentability has not been adequately proven.” *OpenSky*, IPR2021-01064, Paper 102 at 49–50.

IV. CONCLUSION

Upon consideration of the Petition, the Preliminary Response, and the accompanying evidence, we find that the Petition presents compelling evidence of the unpatentability of the challenged claims. Accordingly, we grant Petitioners request that we institute *inter partes* review of claims 8–14 and 16 of the ’566 patent.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, under 35 U.S.C. § 314(a), an *inter partes* review of claims 8–14 of the '566 patent is instituted for all grounds in the Petition; and

FURTHER ORDERED that, under 35 U.S.C. § 314(a), *inter partes* review of the '566 patent is instituted on this Decision's entry date, and under 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is given of the trial's institution.

IPR2024-00985
Patent 10,601,566 B2

For PETITIONER:

Jarrad Gunther
Patrick McPherson
Kevin Anderson
DUANE MORRIS LLP
jmgunther@duanemorris.com
pdmcperson@duanemorris.com
kpanderson@duanemorris.com

For PATENT OWNER:

Vincent Rubino
Peter Lambrianakos
Enrique Iturralde
Julian Pymonto
Jacob Ostling
FABRICANT LLP
vrubino@fabricantllp.com
plambrianakos@fabricantllp.com
eiturralde@fabricantllp.com
jpymonto@fabricantllp.com
jostling@fabricantllp.com
.