

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

TELEFONAKTIEBOLAGET LM ERICSSON,
Patent Owner.

IPR2022-00560
Patent 10,285,150 B2

Before NATHAN A. ENGELS, NORMAN H. BEAMER, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

RAEVSKY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–34 of U.S. Patent No. 10,285,150 B2 (Ex. 1001, “the ’150 patent”). Pet. 1. Telefonaktiebolaget LM Ericsson (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless it is determined that there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition. After considering the parties’ arguments and evidence, and for the reasons set forth below, Petitioner demonstrates a reasonable likelihood of prevailing with respect to at least one of the challenged claims of the ’150 patent. Accordingly, we institute an *inter partes* review with respect to all challenged claims and grounds asserted in the Petition. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1355 (2018).

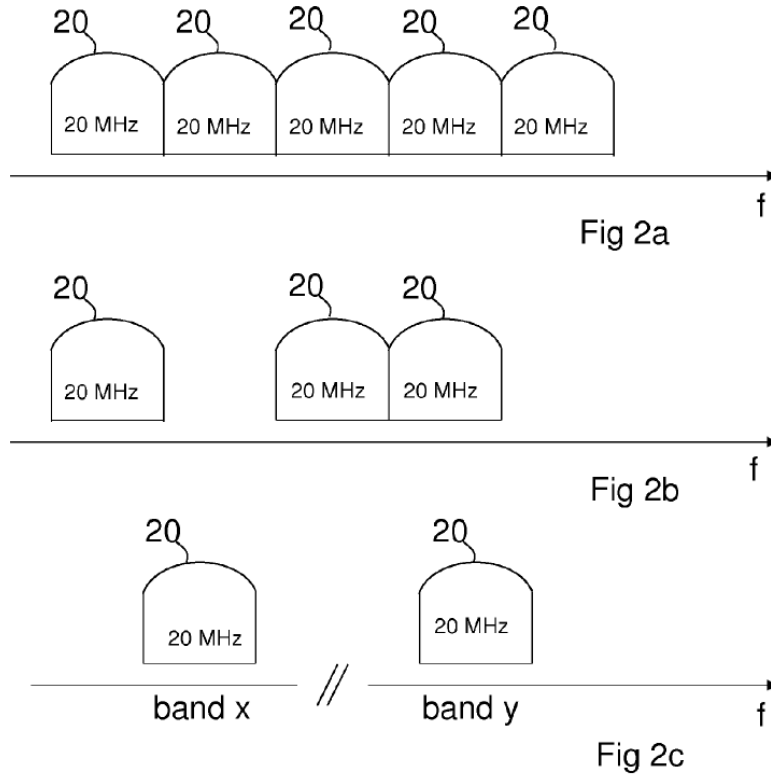
Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far. This is not a final decision as to patentability of the challenged claims.

II. BACKGROUND

A. *The ’150 patent*

The ’150 patent describes a telecommunications system that applies transmission timing alignment with an aggregation of multiple component carriers. Ex. 1001, 1:16–19. This system employs LTE Advanced carrier aggregation, which includes aggregating multiple component carriers instead of using a single component carrier as in previous LTE versions. *Id.* at 1:35–55.

Different examples of carrier aggregation are illustrated in Figures 2a–2c, reproduced below:



Id. at 1:56–57. Figure 2a above illustrates contiguous carrier-band allocation, where five component carriers 20, each of 20 MHz bandwidth, have been aggregated to form a bandwidth of 100 MHz. *Id.* at 1:57–60. Figure 2b illustrates a non-contiguous intra-band carrier aggregation, and Figure 2c illustrates inter-band carrier aggregation. *Id.* at 1:60–67. The number of component carriers may differ for the downlink (DL) and uplink (UL). *Id.* at 2:1–3.

Orthogonality among different users relies on the time-aligned arrival of the UL signals of the different users. *Id.* at 2:19–21. User equipment (UEs) (e.g., cell phones) synchronize their DL timings to DL signals transmitted from a base station (called an “eNodeB”), which may be part of

a cell tower. *Id.* at 2:27–28; Fig. 1. However, due to varying UE to eNodeB distances among UEs, synchronization signals arrive at different time instances at the UEs, resulting in different subsequent UL transmission timing among the UEs. *Id.* at 2:33–35.

In order to align the arrival times of UL signals from different UEs, the eNodeB measures the arrival times of different UL signals relative to a desired arrival time reference and informs the UEs by how much they have to advance or delay their UL transmission timings. *Id.* at 2:51–55. This process is called a timing alignment procedure, and the command used to notify the UEs about the required correction is called a timing advance command. *Id.* at 2:57–59.

In the case of UL carrier aggregation, all UL signals within a component carrier and/or across contiguous component carriers need to be timing aligned in order to maintain orthogonality. *Id.* at 3:7–10. Embodiments of the disclosed invention use only one timing correction for all component carriers, e.g., a single UL timing advance command, when possible. *Id.* at 4:16–19. Using only one timing correction may reduce signal overhead and reduce the complexity of timing correction processing at the UE. *Id.* at 3:22–29.

According to the basic concept of the present invention, the base station receives a signal from a UE on a UL component carrier and measures the arrival time of the signal. *Id.* at 5:34–37. A timing correction of the UL transmission timing based on the arrival time of the signal is determined. *Id.* at 5:37–38. Thereupon the base station determines for which of the uplink component carriers used by the UE the timing correction is valid. *Id.* at 5:39–41. The timing correction and the validity information are sent to the

UE. *Id.* at 5:41–42. The UE then adjusts the UL transmission timing for each UL component carrier for which the timing correction is valid. *Id.* at 5:42–44.

B. Challenged Claims

Claim 1 is illustrative of challenged claims 1–34:

1. A method in a base station for determining an uplink transmission timing correction for communication in a telecommunication system in which aggregation of component carriers is applied, the method comprising:

- receiving a signal on a selected uplink component carrier from a user equipment;
- measuring an arrival time of the received signal;
- determining a timing correction of the uplink transmission timing based on the measured arrival time;
- determining for which of the uplink component carriers used by the user equipment the determined timing correction is valid; and
- sending the timing correction and information on which of the uplink component carriers the timing correction is valid for to the user equipment.

Ex. 1001, 8:59–9:6.

C. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 1), supported by the declaration of Dr. Robert Akl (Ex. 1003):¹

¹ Patent Owner has not submitted declaration testimony at this stage.

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1–34	103(a)	Tenny, ³ Cai, ⁴
1–5, 8–22, 25–34	103(a)	Fan, ⁵ Jeong, ⁶ Du ⁷

III. ANALYSIS

A. Principles of Law

Petitioner bears the burden to demonstrate unpatentability, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A claim is unpatentable as obvious if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007)

² 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 ’150 patent claims priority to one or more applications filed prior to March 16, 2013. Ex. 1001, code (63). Petitioner applies the pre-AIA version of § 103. Pet. 1–2. Patent Owner does not dispute that the pre-AIA version of § 103 applies. We therefore also apply the pre-AIA version of § 103 at this stage.

³ U.S. Patent No. 8,634,313 B2 to Tenny, issued Jan. 21, 2014 (Ex. 1008).

⁴ U.S. Publication No. 2009/0161654 A1 to Cai, published June 25, 2009 (Ex. 1007).

⁵ U.S. Publication No. 2010/0260136 A1 to Fan, published Oct. 14, 2010 (Ex. 1004).

⁶ U.S. Publication No. 2008/0002660 A1 to Jeong, published Jan. 3, 2008 (Ex. 1005).

⁷ U.S. Publication No. 2011/0267957 A1 to Du, published Nov. 3, 2011 (Ex. 1006).

(quoting 35 U.S.C. § 103(a)). We resolve the question of obviousness based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the prior art and the claims; (3) the level of skill in the art; and (4) when in evidence, objective indicia of nonobviousness. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

We apply these principles to the Petition’s challenges.

B. Level of Ordinary Skill in the Art

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. *Graham*, 383 U.S. at 13, 17. Petitioner asserts that

[a] person of ordinary skill in the art . . . (a “POSITA”) would have had a Bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and 2-3 years of experience in the design or development of wireless communication systems, or the equivalent. . . . Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

Pet. 10 (citing Ex. 1003 ¶¶ 18–20).

Patent Owner does not dispute Petitioner’s proposed level of skill in the art at this stage. We are persuaded, on the present record, that Petitioner’s proposal is consistent with the problems and solutions in the ’150 patent and prior art of record. We adopt Petitioner’s definition of the level of skill for the purposes of this Decision.

C. Claim Construction

In *inter partes* review, we construe claims 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), including construing 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. 37 C.F.R. § 42.100(b) (2021).

Petitioner notes that independent claims 18 and 30 and their respective dependent claims recite limitations that “possibly invoke ‘means plus function’ claiming under 35 U.S.C. § 112 ¶ 6.” Pet. 10–11. Petitioner then asserts that these limitations do not invoke § 112 ¶ 6, but “out of an abundance of caution,” nevertheless identifies corresponding structure from the Specification of the ’150 patent for these terms. *Id.* at 11 (citing Ex. 1003 ¶¶ 43–44). Patent Owner does not address Petitioner’s assertions at this stage. *See generally* Prelim. Resp.

Based on our review of the preliminary record, we determine that no terms require construction at this stage. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368 (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))).

D. Asserted Obviousness over Tenny and Cai (Ground 1)

Petitioner contends that claims 1–34 would have been obvious over Tenny and Cai. Pet. 12–42.

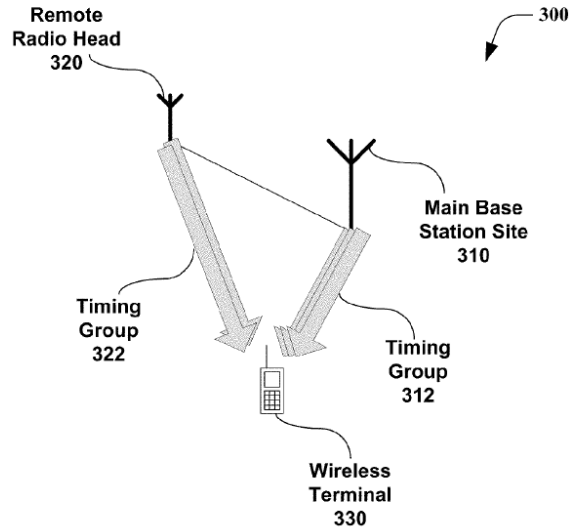
1. Overview of Tenny

Tenny describes timing alignment in a multicarrier system. Ex. 1008, Abstract. At least one downlink timing associated with at least one downlink carrier is determined, and an uplink timing associated with an uplink group of carriers is ascertained based on at least one downlink timing and a timing offset associated with the uplink group of carriers. *Id.* Each of

the uplink group of carriers is then transmitted within a threshold value of the uplink timing. *Id.*

Figure 3 depicts a system where two timing groups are associated with a single eNodeB (base station):

FIG. 3



Id. at 4:8–10. Figure 3 above illustrates how two timing groups may originate from a single eNodeB. *Id.* at 8:54–55. In Figure 3, system 300 includes remote radio head 320 belonging to main base station 310. *Id.* at 8:56–57. Carriers from remote radio head 320 are associated with timing group 322, and carriers from main base station 310 are associated with timing group 312. *Id.* at 8:57–560. Accordingly, wireless terminal 330 receives carriers having different timings from a single eNodeB, where carriers within a timing difference tolerance are grouped together. *Id.* at 8:60–63. Wireless terminal 330 maintains separate timing for each group. *Id.* at 8:66–67.

2. Overview of Cai

Cai describes a system and method for providing uplink timing synchronization in a wireless communication system. Ex. 1007, Abstract. The uplink timing synchronization may be provided via a specific message sent from the user equipment to a network access device, or may be calculated based upon data received at the network access device from the user equipment. *Id.*

Figure 6, below, illustrates a method performed by the network access equipment.

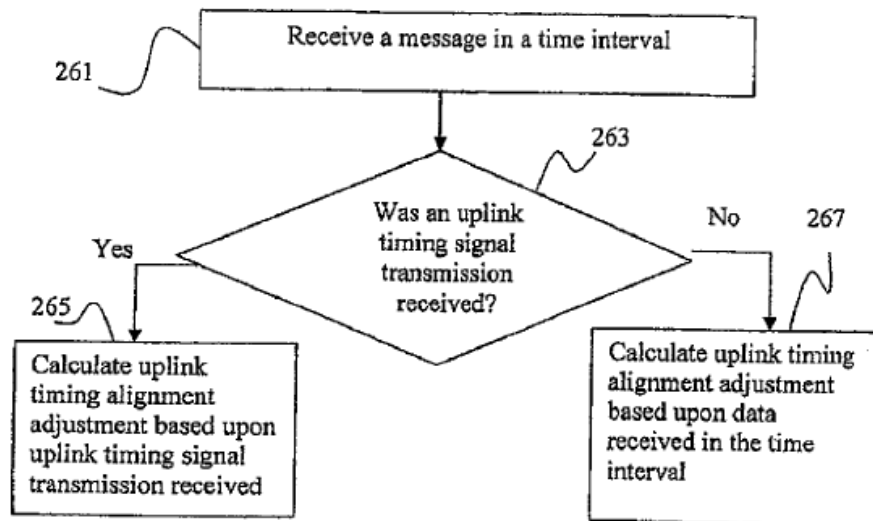


FIG. 6

Id. ¶ 29. At block 261 of Figure 6 above, a message is received. *Id.* Then, at block 263, the network access equipment evaluates the time interval in which it expected to receive a timing reference signal instruction. *Id.* If no such instruction was received, then at block 267 the network access equipment will calculate an uplink timing alignment adjustment based upon the data received. *Id.* If, however, a reference signal was received, at block 265 the network access equipment calculates the uplink timing alignment

adjustment based upon the uplink timing reference signal transmission received. *Id.*

3. *Preliminary matters*

Before we address this ground on the merits, we address several preliminary matters raised by the parties.

a. Examiner's consideration of Tenny and Cai

Patent Owner notes that the Examiner of the application resulting in the '150 patent considered Tenny and Cai during prosecution. Prelim. Resp. 22–24 (citing Ex. 1002, 307, 616). However, Patent Owner does not contend that we should exercise our discretion under 35 U.S.C. § 325(d) to deny the Petition based on the Examiner's consideration of these references. *See id.* Nor would exercising our discretion be proper in this instance, as the Examiner's consideration of Tenny and Cai is not dispositive of all the grounds in the Petition. *See* Pet. 1. As such, we decline to exercise our discretion to deny institution based on the Examiner's consideration of Tenny and Cai.

b. Status of Tenny as prior art

Petitioner contends that Tenny is entitled to its earliest priority date of June 19, 2009 by virtue of a priority claim to a provisional application (“the Tenny Provisional,” Ex. 1010). Pet. 5–9. Patent Owner challenges the status of Tenny as prior art and asserts that it does not properly claim priority to the Tenny Provisional. Prelim. Resp. 26–30. For the reasons stated below, we preliminarily determine that Tenny is likely entitled to its earliest priority date of June 19, 2009.⁸

⁸ Tenny's filing date is earlier than the '150 patent's filing date, but both

Petitioner contends that at least Tenny's independent claim 1 is supported by the disclosure of the Tenny provisional (Ex. 1010). Pet. 6–9. Patent Owner argues that Tenny is missing support for three of these limitations. Prelim. Resp. 26–30. We address each limitation of Tenny's claim 1 in turn.

(1) A method that facilitates a timing alignment in a multicarrier system, the method comprising

Petitioner asserts that the Tenny Provisional supports this preamble by describing “methods for multicarrier system timing alignment.” Pet. 6 (citing, e.g., Ex. 1010, 19; Ex. 1003 ¶ 51). Patent Owner does not dispute this. We agree, on this record, that the Tenny Provisional supports the preamble.

Tenny and the '150 patent stem from earlier-filed provisional applications. The parties disagree regarding whether the '150 patent is entitled to the priority date of its provisional application, June 26, 2009. Pet. 2–5 (arguing the '150 patent's provisional application does not include support for the “sending/receiving” limitations of claims 1, 13, 18, and 30 nor the second “determining” limitations of claims 1 and 18); Prelim. Resp. 13–22 (citing alleged support for each limitation in the '150 patent's provisional application). The parties also disagree regarding whether Tenny is entitled to the priority date of its provisional, June 19, 2009, which precedes the '150 patent's earliest priority date of June 26, 2009. Compare Ex. 1008, code (60), with Ex. 1001, code (60). We note the shifting burdens of production regarding priority, see *Dynamic Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1380 (Fed. Cir. 2015), but because we preliminarily determine that Petitioner has met a burden of production to show that Tenny is entitled to its earliest priority date (Pet. 5–9), we need not determine at this stage whether Patent Owner has met a burden of production to show that the '150 patent is entitled to its earliest priority date.

*(2) determining different downlink timings
associated with a plurality of downlink carriers*

Petitioner asserts that the Tenny Provisional supports this limitation by disclosing that a UE “tracks the (downlink) timing of each carrier in the group separately.” Pet. 6 (citing Ex. 1010, 15). Petitioner also points to the Tenny Provisional’s disclosure of “monitoring a downlink timing for each carrier in the at least one timing group.” *Id.* at 6–7 (citing Ex. 1010, 5, 7–8, 29; Ex. 1003 ¶ 52).

Patent Owner disputes that the Tenny Provisional supports “determining different downlink timings.” Prelim. Resp. 26 (emphasis omitted). In particular, the word “determining” is not supported, Patent Owner argues. *Id.* Patent Owner further contends that it would be inappropriate to modify the Tenny Provisional’s teachings of a UE “tracking” and “monitoring” downlink timing to mean “determining” different downlink timings, “as [Petitioner] appears to suggest.” *Id.* at 27. Also, Patent Owner notes that the Tenny Provisional does not include the “UE’s downlink timing component 630” that is disclosed in Tenny itself. *Id.* at 28. Lastly, Patent Owner faults Petitioner’s expert for supplying a conclusory opinion. *Id.* at 27.

On this record, we agree with Petitioner that tracking and monitoring downlink timing of each carrier discloses “determining different downlink timings.” See Ex. 1010, 15, 5. The disclosure, as originally filed, need not literally describe the claimed subject matter (i.e., using the same terms or *in haec verba*) in order to satisfy the written description requirement. *Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000). And

Patent Owner does not persuasively argue how “determining” is materially different from “tracking” or “monitoring.”

(3) ascertaining an uplink timing associated with an uplink group of carriers including a first uplink carrier and a second uplink carrier,

Petitioner asserts that the Tenny Provisional supports this limitation by disclosing a “timing group, *i.e.*, **a group of carriers**” (*i.e.*, a first and second uplink carrier) “with uplink timings that are the same to within some tolerance.” Pet. 7 (citing Ex. 1010, 12). And Petitioner further points to the Tenny Provisional’s disclosure that “[w]ithin each timing group, the UE may need to occasionally perform random access to **update its timing**.” *Id.* (citing Ex. 1010, 14–16, 18, 27; Ex. 1003 ¶ 53).

Patent Owner does not dispute this. We agree, on this record, that the Tenny Provisional supports this limitation.

(4) wherein the uplink timing is ascertained based on a processing of at least one downlink timing of the different downlink timings and

Petitioner argues that the Tenny Provisional describes “**monitoring a downlink timing for each carrier in the at least one timing group** and modifying the timing offset according to an average of the offset applied to the monitored downlink timings for each carrier.” Pet. 7 (citing Ex. 1010, 4, 29; Ex. 1003 ¶ 54). Petitioner further asserts that the UE performs this action to “align its uplink transmissions in relation to the received downlink timing.” *Id.* (citing Ex. 1010, 12; Ex. 1003 ¶ 54).

Patent Owner contends that Petitioner fails to identify any “processing” of the “downlink timing” and also fails to identify any “processing” of the “timing offset.” Prelim. Resp. 29. But as before, Patent

Owner's argument is too literal, and Patent Owner does not persuasively explain how "monitoring" and "aligning" fail to disclose "processing." To the contrary, Petitioner persuades us at this stage that the indicated disclosures in the Tenny Provisional, including "monitoring," support the claimed "processing."

(5) a timing offset associated with the uplink group of carriers, and the at least one downlink timing of the different downlink timings; and

For this limitation, Petitioner contends that the Tenny Provisional discloses "monitoring a downlink timing for each carrier in the at least one timing group and ***modifying the timing offset according to an average of the offset applied to the monitored downlink timings for each carrier.***" Pet. 8 (citing Ex. 1010, 4, 29 ("apply the . . . offset for use with all carriers in the group"); Ex. 1003 ¶ 55). According to Petitioner, the UE performs this action to "align its uplink transmissions in relation to the received downlink timing." *Id.* (citing Ex. 1010, 12; Ex. 1003 ¶ 55).

Patent Owner responds that "[a]t best, the Tenny Provisional application discloses that a timing offset is received on a carrier," not that the offset is "associated with a 'group' of carriers and a downlink timing." Prelim. Resp. 30. We disagree, on this record, because Petitioner persuasively points to supporting disclosure in the Tenny Provisional. Pet. 8. For instance, the Tenny Provisional discloses "apply[ing] the . . . offset for use with all carriers in the group" and "modifying the timing offset according to an average of the offset applied to the monitored downlink timings for each carrier." Ex. 1010, 4, 29, *cited in* Pet. 8. Thus, contrary to Patent Owner's argument, on this record the Tenny Provisional's offset is indeed associated with a group of carriers ("offset for use with all carriers in

the group”) and downlink timing (“offset applied to the monitored downlink timings”).

(6) transmitting on the first uplink carrier at the uplink timing adjusted based on the timing offset associated with the at least one downlink timing of the different downlink timings, and on the second uplink carrier at the adjusted uplink timing.

Petitioner points to the Tenny Provisional’s disclosure that “a single timing advance value can be indicated to the UE for use with all the carriers in the group, such that ***the resulting uplink timing when the UE transmits with this timing advance value towards any carrier in the group will be sufficiently accurate for communication with that carrier***, where ‘sufficiently accurate’ is defined in terms of some second tolerance.” Pet. 8 (citing Ex. 1010, 16; Ex. 1003 ¶ 56). Patent Owner does not dispute that the Tenny Provisional supports this limitation. On this record, we agree with Petitioner that the Tenny Provisional supports it.

Accordingly, at this stage, we agree with Petitioner that the Tenny Provisional supports claim 1 of Tenny and that Tenny is entitled to the June 19, 2009 priority date of the Tenny Provisional.

c. Petitioner’s citations to the Tenny Provisional

Patent Owner further contends that Petitioner relies on newly added disclosures in Tenny that are not present in the Tenny Provisional. Prelim. Resp. 30–35. This is problematic, according to Patent Owner, because “any disclosure that is not present in ***both*** the Tenny Provisional ***and*** Tenny itself is not available as prior art.” *Id.* at 30 (citing *Ex Parte Mann*, 2016 WL 7487271, at *5 (PTAB Dec. 21, 2016)). Patent Owner argues that Petitioner

does not even attempt to meet this requirement. *Id.* at 31. Patent Owner points to two limitations in claims 13 and 30, limitations 13.1 and 30.1, for which Petitioner did not supply citations to the Tenny Provisional. *Id.* at 31–33. In addition, Patent Owner argues that Petitioner “relies exclusively on multi-page citations to the Provisional application without any explanatory context for those citations.” *Id.* at 33. Along those lines, Patent Owner contends for claim 1 that such multi-page citations “do not support the idea of a base station having a timing offset component that ***assigns a timing offset to an uplink group*** of carriers.” *Id.* at 34 (citing Pet. 24–25).⁹ Patent Owner further contends that for claim 1, Petitioner improperly relies on Tenny’s discussion of Figure 9, which was added after the Tenny Provisional. *Id.*

Petitioner’s citations to the Tenny Provisional satisfy us at this stage that the subject matter relied upon in Tenny is sufficiently supported in the Tenny Provisional, as applied to the ’150 patent claims. Although Patent Owner is correct that Petitioner does not supply a citation to the Tenny Provisional for claim elements 13.1 and 30.1, these elements are very similar to claim element 1.1, for which Petitioner did supply Tenny Provisional citations. *See* Prelim. Resp. 31–33; Pet. 18–19. Element 13.1 recites “sending a signal on an uplink component carrier to a base station,” which is similar to but claimed from a different perspective from element 1.1’s “receiving a signal on a selected uplink component carrier from a user equipment.” These limitations are similar because claim 13 recites “[a]

⁹ Although Patent Owner does not explicitly refer to claim 1 in this argument, Patent Owner’s argument refers to a portion of the Petition (Pet. 24–25) that discusses claim 1.

method in a user equipment,” and the user equipment of claim 13 is “sending” a similar signal that is received from a user equipment in claim 1. Likewise, claim 30 recites “[a] user equipment,” and element 30.1 recites “a transmitter for sending a signal on an uplink component carrier to a base station.” By arguing for support in the Tenny Provisional for limitation 1.1, we determine that Petitioner has adequately addressed the Tenny Provisional’s disclosure at this stage for similar limitations 13.1 and 30.1.

Patent Owner’s argument that Petitioner “relies exclusively on multi-page citations” to the Tenny Provisional is also unavailing at this stage. *See* Prelim. Resp. 33–34. Petitioner supplies citations to the Tenny Provisional, and Patent Owner’s only quarrel at this point is with the breadth of those citations, not their substance. *See id.* Relatedly, we also do not find merit at this stage in Patent Owner’s argument that, for claim 1, Petitioner improperly relies on Tenny’s discussion of Figure 9, because Petitioner cites to several portions of Tenny and the Tenny Provisional for claim 1. *See id.* at 34; Pet. 24–25. Thus, whether Figure 9 was present in the Tenny Provisional is not dispositive of the support issue for claim 1.

4. *Independent claim 1*

- a. *A method in a base station for determining an uplink transmission timing correction for communication in a telecommunication system in which aggregation of component carriers is applied, the method comprising*

Petitioner contends that to the extent the preamble is limiting, it would have been obvious over the combination of Tenny and Cai. Pet. 17–18. Petitioner points to Tenny’s disclosure of “***maintaining timing synchronization*** for user equipment ***in a multicarrier Long Term Evolution-Advanced (LTE-A) system.***” *Id.* at 18 (citing Ex. 1008, 1:24–28;

Ex. 1010, 12). The term “multicarrier,” according to Petitioner, is just another name for “aggregation of component carriers.” *Id.* (citing, e.g., Ex. 1003 ¶ 66). Petitioner also asserts that Tenny discloses a “base station” and “user equipment.” *Id.* (citing Ex. 1008, 6:13–53).

Patent Owner argues that Petitioner has not established that Tenny discloses these features. Prelim. Resp. 43–44. In Patent Owner’s view, Petitioner “never explains *how* the ‘timing synchronization’ relates to the claimed ‘base station for determining an **uplink** transmission correction.’” *Id.* at 43. Relatedly, Patent Owner contends that Tenny does not disclose *uplink* transmission correction—only using *downlink* timing to synchronize communications. *Id.* (citing, e.g., Ex. 1008, 1:56–64, 13:16–18).

At this stage, Petitioner’s argument is more persuasive. The issue with Patent Owner’s argument is that Patent Owner simply assumes that the preamble is limiting without explaining why that is the case. But “[g]enerally, a preamble is not limiting.” *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1292 (Fed. Cir. 2015). “For example, ‘[p]reamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim.’” *Id.* (quoting *Pacing Techs., LLC v. Garmin Int’l, Inc.*, 778 F.3d 1021, 1023–24 (Fed. Cir. 2015)). Patent Owner does not contend that the preamble of claim 1 is necessary to provide antecedent basis or that during prosecution, the applicant placed clear reliance on the preamble. *See id.* And at this stage, it appears that the preamble is duplicative of the limitations in the body of the claim and merely provides context for the limitations. *See id.* Thus, at this stage, we preliminarily determine that the preamble is not limiting. As such, Patent Owner’s arguments relying on the preamble are unavailing.

b. [1.1] receiving a signal on a selected uplink component carrier from a user equipment

Petitioner asserts that Tenny discloses “uplink communication” within an “uplink group of carriers.” Pet. 18-19 (citing Ex. 1008, 3:40–42, Fig. 11; Ex. 1010, 20, 22, 23). Also relying on Cai, Petitioner asserts that Cai describes network access equipment that “**receives the message**” from the UE containing either the uplink timing reference signal or the uplink data. *Id.* at 19 (citing, e.g., Ex. 1007 ¶ 29; Ex. 1003 ¶ 69).

At this stage, Patent Owner does not dispute Petitioner’s arguments for this limitation. On this record, we agree with Petitioner that the combination of Tenny and Cai likely discloses it.

c. [1.2] measuring an arrival time of the received signal; [and]

[1.3] determining a timing correction of the uplink transmission timing based on the measured arrival time

We address limitations 1.2 and 1.3 together as related limitations. For limitation 1.2, Petitioner contends that Cai “calculate[s] the uplink channel conditions by analyzing signals sent from the UE” and “evaluates the time interval in which it expected to receive a timing reference signal instruction.” Pet. 20–21 (citing, e.g., Ex. 1007 ¶¶ 27, 29, 31; Ex. 1003 ¶ 70) (emphasis omitted). For limitation 1.3, Petitioner refers to the same disclosure as noted for limitation 1.2, as well as Cai’s further disclosure that “the network access equipment will calculate an uplink timing alignment adjustment based upon the data received.” *Id.* at 22 (citing Ex. 1007 ¶¶ 29, 31; Ex. 1003 ¶ 70) (emphasis omitted). Notwithstanding Patent Owner’s

arguments, which we address below, we agree with Petitioner that the combination of Tenny and Cai discloses these limitations.

Patent Owner argues that the combination of Tenny and Cai fails to disclose these two limitations. Prelim. Resp. 44–45. First, Patent Owner contends that “Cai’s uplink data cannot correspond to the claimed ‘signal on a selected uplink component carrier’ because Cai does not disclose aggregated component carriers.” *Id.* (similarly arguing that “the combination does not include such a ‘selected signal’”). But Petitioner relies on Tenny (in limitation 1.1) for the claimed “signal on a selected uplink component carrier” and for “aggregation of component carriers” (in the preamble). *See* Pet. 17–18. Thus, Patent Owner argues the references individually, which is unpersuasive when a ground is based on a combination of references. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Patent Owner next contends that Petitioner never explained how the “timing synchronization” from Tenny is determined based on the measured arrival time of the uplink data from Cai. Prelim. Resp. 44. So, Patent Owner concludes, Petitioner failed to explain how the combination meets these two limitations. *Id.* at 44–45. At this stage, Patent Owner again argues the references individually because Petitioner relies primarily on Cai for these limitations, but Patent Owner’s argument focuses on how Petitioner allegedly did not connect Cai’s teachings with Tenny’s “timing synchronization.” *See id.*; Pet. 20–22. As such, Patent Owner’s arguments are unavailing at this stage.

d. [1.4] *determining for which of the uplink component carriers used by the user equipment the determined timing correction is valid; and*

[1.5] sending the timing correction and information on which of the uplink component carriers the timing correction is valid for to the user equipment.

We find it useful to again group together the next two limitations, 1.4 and 1.5. For limitation 1.4, Petitioner contends that Tenny describes carriers that are “grouped into ***‘timing groups’*** with the similar timing information . . . ***wherein signaling behavior for timing synchronization takes place on a per-group basis rather than a per carrier basis.***” Pet. 24 (citing Ex. 1008, 4:59–63, 8:30–33; Ex. 1010, 12–13). Petitioner further explains that Tenny’s network access equipment “***“assign[s] a timing offset’*** (i.e., a timing correction) ***‘to an uplink group of carriers.’***” *Id.* at 24–25 (citing, e.g., Ex. 1008, 15:42–44). Finally, Petitioner asserts that Tenny’s base station “***“determin[es] the uplink group subset’*** to which the timing offset is valid.” *Id.* at 25 (citing Ex. 1008, 16:1–18; Ex. 1010, 15–16, 18; Ex. 1003 ¶ 74).

As for limitation 1.5, Petitioner contends that Tenny’s base station “generate[s] a timing message encoded with a set of uplink timing instructions” and “transmit[s] the timing message to a wireless terminal” (a user equipment). *Id.* (citing Ex. 1008, 15:66–16:5; Ex. 1010, 15–16). Petitioner further contends, for example, that the timing message can be “encoded with an ***indication of which of the plurality of uplink groups are included in the uplink group subset,***” which Petitioner maps to the claimed “information on which of the uplink component carriers the timing

correction is valid for.” *Id.* (citing Ex. 1008, 16:25–27; Ex. 1010, 15–16; Ex. 1003 ¶ 75).

Patent Owner contends that Petitioner failed to establish that the Tenny-Cai combination discloses “a base station that determines whether the timing correction is **valid** for other uplink component carriers . . . [and] that **sends that validity information to user equipment or user equipment that receives that validity information** from a base station.” Prelim. Resp. 46. Patent Owner faults Petitioner for arguing that Tenny’s “timing offset is simply assigned to an uplink group of carriers.” *Id.* (citing Pet. 24–25). In the combination, Patent Owner argues, “the UE receives an offset and applies it to the entire group using the ‘close enough’ or ‘happy medium’ approach.” *Id.* at 47 (citing Ex. 1010, 14–15).¹⁰ Consequently, in Patent Owner’s view, the “base station does not determine whether that ‘offset’ is valid for the carriers within the aggregated carriers” or “communicate the determined validity information to the UE.” *Id.* at 47–48.

At this stage, Petitioner is more persuasive. These limitations are worded broadly, and Patent Owner has not offered any claim construction that would narrow their plain and ordinary meaning. On this record, it appears to us that Tenny likely discloses these limitations. For example, Tenny discloses “timing synchronization” that “takes place on a per-group

¹⁰ Tenny’s “close enough” approach is described in the Tenny Provisional as follows: “The simplest approach [to correcting uplink timing] is for the UE simply to apply the timing offset to the carrier on which it received it, and assume that the timing of other carriers in the group is ‘close enough.’” Ex. 1010, 14. Tenny’s “happy medium” approach is where “the UE can apply the offset separately to each carrier and take an average of the results to provide a ‘happy medium’ uplink timing for use with all carriers in the group.” *Id.* at 15.

basis rather than a per carrier basis.” Ex. 1008, 4:59–63. And Tenny “assign[s] a timing offset to an uplink group of carriers.” *Id.* at 15:43–44. Patent Owner’s attempt to distinguish Tenny by arguing how Tenny’s UE performs a different technique (a “close enough” or “happy medium” approach) overlooks that the claim does not recite in any detail *how* validity is determined, only that it *is* determined. It is sufficient for limitation 1.4, on this record, that Petitioner asserts that Tenny determines validity, for example, by synchronizing timing on a per-group of carriers basis rather than on a per carrier basis. *See* Pet. 4. And for limitation 1.5, it is sufficient, on this record, that Petitioner asserts that Tenny’s timing message sent to the UE can be “encoded with an ***indication of which of the plurality of uplink groups are included in the uplink group subset.***” Pet. 25.

e. Motivation to combine

Petitioner contends that it would have been obvious to modify Tenny’s system to calculate uplink timing corrections based on analyzing received uplink transmissions, as taught in Cai. Pet. 15. According to Petitioner, Cai’s techniques eliminate the need for the UE to transmit a specific reference transmission for the base station to calculate the timing adjustment. *Id.* As a result, Petitioner contends, incorporating Cai’s techniques into Tenny can reduce network overhead, improve network efficiency, and improve UE battery life. *Id.* at 15–16 (citing, e.g., Ex. 1003 ¶¶ 62–63). Petitioner further argues that modifying Tenny with Cai would have entailed the use of known solutions to improve similar systems and methods in the same way, leading to predictable results, with a reasonable expectation of success. *Id.* at 16–17 (citing, e.g., Ex. 1003 ¶¶ 63–64).

Patent Owner contends that replacing Tenny’s downlink timing with Cai’s uplink timing would eviscerate Tenny’s “close enough” and “happy medium” approaches to synchronizing multiple carriers, fundamentally altering Tenny’s principle of operation. Prelim. Resp. 40–41. Relatedly, Patent Owner faults Petitioner for failing to explain why a POSITA would change Tenny’s operation from downlink to uplink timing operations “only in instances where there is no data to transmit.” *Id.* at 41. Further, Patent Owner contends that Petitioner does not adequately analyze how Cai’s calculations would operate for correcting an uplink group’s timing. *Id.* And Patent Owner asserts that Tenny’s UE already “update[s] its timing” for “*the entire group of carriers* without Cai’s uplink disclosure.” *Id.* at 41–42 (citing Ex. 1010, 13:8–13).

Petitioner’s motivation to combine arguments are more persuasive at this stage. Petitioner articulates persuasive benefits for combining the references, supported by Dr. Akl’s testimony, including reducing network overhead, improving network efficiency, and improving UE battery life. Pet. 15–16 (citing, e.g., Ex. 1003 ¶ 62). Patent Owner’s asserted disadvantages to combining constitute speculative attorney argument. For instance, it is unclear on this record how combining Cai with Tenny would “eviscerate” Tenny’s approach, as Patent Owner alleges. And we are not convinced at this stage that Petitioner inadequately analyzed the combination as Patent Owner proposes. For purposes of this Decision, Petitioner has articulated sufficient reasons to combine Tenny and Cai, supported by rationale underpinning.

f. Summary as to Claim 1

Based on the preliminary record before us, Petitioner has shown a reasonable likelihood that the combination of Tenny and Cai would have rendered claim 1 obvious.

5. Independent Claims 13, 18, 30

Petitioner raises similar arguments for independent claims 13, 18, and 30 as for claim 1, identifying any pertinent differences. *See* Pet. 30–42. Patent Owner relies on its arguments for claim 1 for these claims. Prelim. Resp. 22–48. For similar reasons as discussed above, Petitioner has shown a reasonable likelihood that the combination of Tenny and Cai would have rendered claims 13, 18, and 30 obvious.

6. Dependent Claims 2–12, 14–17, 19–29, and 31–34

Petitioner contends that dependent claim 2–12, 14–17, 19–29, and 31–34 would have been obvious over the combination of Tenny and Cai. Pet. 25–30, 34–35, 39–40, 42. Petitioner provides a detailed analysis explaining where the combination of Tenny and Cai discloses the limitations in these dependent claims, which Patent Owner does not contest at this preliminary stage. Based on the current record, we determine that Petitioner has demonstrated a reasonable likelihood that the combination of Tenny and Cai would have rendered obvious claims 2–12, 14–17, 19–29, and 31–34.

E. Asserted Obviousness over Fan, Jeong, and Du (Ground 2)

Petitioner also contends that claims 1–5, 8–22, and 25–34 would have been obvious over Fan, Jeong, and Du. Pet. 42–69.

1. Overview of Fan

Fan describes methods for performing random access procedures in a wireless communications system. Ex. 1004, Abstract. Fan explains that in

LTE-A it is proposed that the total system bandwidth may have from two to five component carriers (CCs). *Id.* ¶ 84. Fan describes methods for bundling of Random Access (RA) preamble responses that are sent for preambles observed in different time and frequency resources and on different component carriers, such that the bundled preamble response is sent on one component carrier. *Id.* ¶ 108. Each response may include an indication of the CC on which the preamble was received, the sequence, frequency and subframe index, a timing advance (TA) command and the UL grant, and multiple ones of these responses are bundled in the same response message. *Id.* ¶ 113.

2. Overview of Jeong

Jeong describes a method for maintaining uplink timing synchronization by a UE in a mobile communication system. Ex. 1005, Abstract. Jeong's method is performed without UL transmission of a preamble from a UE or without transmission of UL timing difference information from an Evolved Node B (E-NB) (base station). *Id.*

In Jeong, a UE generates a preamble code and transmits the preamble code over the uplink using radio resources allocated by the E-NB. *Id.* ¶ 38. Upon receipt of the preamble code, the E-NB calculates a correlation between the received preamble code and candidate preamble codes available for UL timing synchronization during a sliding window having a constant interval, to find the timing and preamble code indicating the highest correlation. *Id.* Jeong further describes that the E-NB calculates a difference between the reception timing and the timing in which it should actually have received the preamble code, and provides the UE with an ID of

the preamble code and information on the UL timing difference using a response message (“UL SYNC RES”). *Id.*

3. *Overview of Du*

Du describes a communication system capable of sending a transmission over an interface having at least two aggregated component carriers. Ex. 1006, Abstract. Du’s system defines a timing gap between, in the UE, successful decoding of the transmission indication and starting of an inactivity timer on a secondary component carrier. *Id.* ¶ 16. Du teaches that defining such a timing gap is performed by the base station sending to a UE a timing gap message for configuring the UE to impose the timing gap between the successful decoding of the transmission indication and the starting of an inactivity timer on a secondary component carrier. *Id.*

4. *Independent Claim 1*

- a. *A method in a base station for determining an uplink transmission timing correction for communication in a telecommunication system in which aggregation of component carriers is applied, the method comprising*

Petitioner contends that to the extent the preamble is limiting, the combination of Fan, Jeong, and Du would have rendered it obvious. Pet. 48. According to Petitioner, Fan discloses, for example, using “two to five **component carriers (CCs)**.” *Id.* (citing Ex. 1004 ¶ 84). And Petitioner contends that Jeong discloses calculating a “‘**UL timing difference**’ (an uplink transmission timing correction” and sending this difference to a UE. *Id.* at 48–49 (citing Ex. 1005 ¶ 38; Ex. 1003 ¶ 141). Patent Owner does not dispute these assertions at this stage. On this record, we agree with Petitioner that the combination of Fan, Jeong, and Du likely discloses the preamble, whether or not it is limiting.

b. [1.1] receiving a signal on a selected uplink component carrier from a user equipment

Petitioner asserts, for example, that Fan discloses this limitation by teaching “receiving at a network access node . . . and in different ones of a plurality of component carriers, a plurality of random access requests.” Pet. 49 (citing Ex. 1004 ¶ 103¹¹) (emphasis omitted). Patent Owner does not dispute Petitioner’s assertions at this stage. On this record, we agree with Petitioner that the combination of Fan, Jeong, and Du likely discloses this limitation.

c. [1.2] measuring an arrival time of the received signal

For this limitation, Petitioner contends that Jeong discloses, for example, that a base station “calculates a difference between the ***then-reception timing***’ (the arrival time) ‘and the timing in which it should actually have received the preamble code.’” Pet. 50–51 (citing Ex. 1003 ¶ 146; Ex. 1004 ¶¶ 40–47). Patent Owner does not dispute Petitioner’s assertions at this stage. On this record, we agree with Petitioner that the combination of Fan, Jeong, and Du likely discloses this limitation.

d. [1.3] determining a timing correction of the uplink transmission timing based on the measured arrival time

Petitioner relies on Jeong for this limitation. Pet. 51. According to Petitioner, Jeong describes that a base station (E-NB 402) “***calculates a difference between the then-reception timing***” (the arrival time) “***and the timing in which it should actually have received the preamble code***, and

¹¹ This citation appears to be in error, and the correct paragraph referenced appears to be paragraph 130 of Ex. 1004.

provides in step 422 the UE 401 with an ID of the preamble code and information on ***the UL timing difference***” (a timing correction) “using a response message (UL SYNC RES).” *Id.* (citing Ex. 1005 ¶ 38; Ex. 1003 ¶ 147).

Patent Owner contends that Petitioner’s combination requires Jeong’s “UL SYNC REQ” to correspond with the claimed “signal” (first recited in limitation 1.1). Prelim. Resp. 55. Patent Owner then contends that Petitioner analogizes the claimed “signal” to Fan’s “random access request,” not Jeong’s “UL SYNC REQ.” *Id.* at 56 (citing Pet. 49). In Patent Owner’s view, Petitioner is “picking and choosing on an element-by-element basis” using improper hindsight because Petitioner “provides no analysis linking Fan’s ‘random access request’ to Jeong’s UL SYNC REQ.” *Id.* at 56–57.

On this record, we do not agree with Patent Owner. Petitioner sets forth sufficient argument and evidence, for purposes of meeting its institution burden, that Jeong discloses this limitation. Patent Owner appears to argue the references individually, which as we explained above, is improper when considering obviousness over a combination of references. *See Merck*, 800 F.2d at 1097. For instance, the term “signal” does not appear in this limitation, but rather first appears in limitation 1.1, for which Petitioner relies on Fan. Pet. 49. Thus, on this record, Patent Owner’s argument that Jeong’s “UL SYNC REQ” must correspond with the claimed “signal” is improper.

Patent Owner further contends that Petitioner “provides out-of-context quotations that fail to account for how [Petitioner] proposing [*sic*] the cited references.” Prelim. Resp. 57. For example, Patent Owner contends that Petitioner “overlooks the statements in Jeong’s Abstract and paragraph 54,

which unequivocally state that timing synchronization is achieved ‘without transmission of uplink timing information from an Evolved Node B (E-NB) to solve the inefficient use problem of radio resources.’” *Id.* (citing Ex. 1005, Abstract, ¶ 54; Pet. 51). Patent Owner then takes issue with Petitioner’s reliance on paragraph 38 of Jeong, which in Patent Owner’s view, “relates to ***an initial UL timing synchronization*** process when communication with a UE is first established.” *Id.* at 58. According to Patent Owner, “[t]his initialization would occur before the base station must correct the uplink timing for carriers among the aggregated carriers.” *Id.*

At this stage, Patent Owner’s argument is unclear. We are unable to discern at this stage what Patent Owner’s basis is for attacking Petitioner’s positions, apart from challenging Petitioners alleged use of “out-of-context quotations.” *Id.* at 57. We also question how initialization occurring before the base station corrects uplink timing in Jeong could detract from Petitioner’s case, as the ’150 patent states that validity information can be “determined during setup of the base station and sent to the UE when an UL component carrier is added.” Ex. 1001, 7:38–42. Thus, on this record, Patent Owner’s argument does not undermine Petitioner’s arguments and evidence, which are sufficient for purposes of institution on this limitation.

e. [1.4] determining for which of the uplink component carriers used by the user equipment the determined timing correction is valid; and

Petitioner contends that Fan, or alternatively, Du, discloses this limitation. Pet. 51–53. For example, Petitioner contends that Fan discloses that “[*e*]ach response may include an indication of the CC on which the preamble was received, the sequence, frequency and subframe index, a timing advance (TA) command and the UL grant, and multiple ones of these

responses are bundled in the same response message that is assigned with a RA-RNTI.” *Id.* at 51 (citing Ex. 1004 ¶ 113). Petitioner then contends that it would have been obvious “that including the indication of the CC on which the preamble was received includes determining which of the uplink component carriers used by the user equipment the determined timing correction is valid (*i.e.*, Fan determines that the CC on which the preamble was received is the CC for which the timing correction is valid).” *Id.* at 51–52 (citing Ex. 1003 ¶ 148; Ex. 1004 ¶ 113).

As for Du, Petitioner contends that Du additionally or alternatively teaches defining a “timing gap” and sending a message to a UE to impose the timing gap “***on a secondary component carrier.***” *Id.* at 52 (citing, e.g., Ex. 1006 ¶ 16). According to Petitioner, “a POSITA would have found it obvious to use a single timing adjustment (as calculated in Jeong) for the multiple component carriers described in Fan based on the teachings of Du, which defines as a common ‘timing gap’ for message reception on the downlink to apply to multiple component carriers.” *Id.* at 52–53 (citing, e.g., Pet. § III.B.4–5; Ex. 1003 ¶ 149). And Petitioner further contends that it would have been obvious “to extend this technique of Du to perform an analogous adjustment to the uplink timing for the component carriers.” *Id.* at 53.

Patent Owner contends that Petitioner’s combination is “internally inconsistent.” Prelim. Resp. 60. This is because, Patent Owner argues, Petitioner never links Jeong’s initialization value to being valid or not for component carriers. *Id.* Rather, Patent Owner contends, Fan’s timing advance command “is specific to only one component carrier during communication.” *Id.* at 61 (citing Ex. 1004 ¶ 113). Patent Owner further

contends that “the UE in the proposed combination would not use Fan’s single carrier timing advance command” to adjust uplink timing of other UL component carriers for which the timing correction is valid for. *Id.*

Petitioner sufficiently articulates, for purposes of institution, how the Fan-Jeong-Du combination teaches or suggests this limitation. For instance, we agree on this record that Fan’s bundling of multiple responses regarding timing advances for component carriers would have rendered obvious this limitation. *See* Ex. 1004 ¶ 113; Ex. 1003 ¶ 148. Patent Owner’s assertion that Petitioner never links Jeong’s initialization value to being valid, and thus, Fan’s timing advance command is specific to only one component carrier, again argues the references individually. *See* Prelim. Resp. 61. We also view as persuasive, at this stage, Petitioner’s contention that Du imposes a timing gap “on a secondary component carrier.” Pet. 52 (citing, e.g., Ex. 1006 ¶ 16) (emphasis omitted). We agree that a POSITA likely “would have found it obvious to use a single timing adjustment (as calculated in Jeong) for the multiple component carriers described in Fan based on the teachings of Du, which defines as a common ‘timing gap’ for message reception on the downlink to apply to multiple component carriers.” *Id.* at 52–53 (citing, e.g., Pet. § III.B.4–5; Ex. 1003 ¶ 149).

- f. [1.5] *sending the timing correction and information on which of the uplink component carriers the timing correction is valid for to the user equipment.*

Petitioner asserts that Fan describes “***bundling of RA preamble responses that are sent for preambles observed*** in different time and frequency resources and ***on different component carriers such that the bundled preamble response is sent on one component carrier.***” Pet. 53 (citing Ex. 1004 ¶ 108). Among other things, according to Petitioner, each

response may include “an indication of the CC on which the preamble was received” and “a timing advance (TA) command.” *Id.* (citing Ex. 1004 ¶ 113; Ex. 1003 ¶ 150) (emphasis omitted).

Patent Owner argues that this limitation is patentable for the same reasons as the previous limitation, without providing any materially separate arguments for this limitation. *See* Prelim. Resp. 60–61. We find Petitioner’s arguments more persuasive at this stage. For example, on this record, we agree with Petitioner that Fan’s “indication of the CC on which the preamble was received” and the “timing advance (TA) command” sufficiently disclose this limitation. *See* Pet. 53 (citing Ex. 1004 ¶ 113; Ex. 1003 ¶ 150).

g. Motivation to combine

Petitioner asserts that a POSITA would have found it obvious to modify Fan’s carrier aggregation system to incorporate Jeong’s timing adjustment calculation. Pet. 45. Doing so would have enabled the combined system to accurately calculate timing adjustments for uplink component carriers, Petitioner argues, which would further have enabled the system to operate reliably and with minimal issues related to data alignment across its multiplexed data carriers. *Id.* (citing, e.g., Ex. 1003 ¶ 134). Petitioner also contends that a POSITA would have found it obvious to use Jeong’s single timing adjustment for Fan’s multiple component carriers based on Du’s teachings, which define a common “timing gap” for message reception on the downlink to apply to multiple component carriers. *Id.* at 46 (citing, e.g., Ex. 1003 ¶ 135). According to Petitioner, doing so would have improved network efficiency. Finally, Petitioner argues that the combination would have been obvious because it would have entailed the use of known

solutions to improve similar systems and methods in the same way. *Id.* (citing Ex. 1003 ¶ 136; *KSR*, 550 U.S. at 417).

Patent Owner contends that Du fails to disclose the application of a timing correction to multiple aggregated carriers. Prelim. Resp. 53. And Patent Owner contends that Petitioner engages in improper hindsight, picking and choosing specific elements from the references. *Id.*

Petitioner persuades us sufficiently for purposes of institution that a POSITA would have combined Fan, Jeong, and Du. Patent Owner's contention that Du fails to disclose the application of a timing correction to multiple aggregated carriers argues the references individually because Petitioner relies on Jeong, not Du, for the limitation that Patent Owner appears to be referring to (limitation 1.3). Pet. 51. Patent Owner's argument against Du also does not address Petitioner's proposed rationale to combine. And Patent Owner's argument that Petitioner engages in hindsight is conclusory and unsupported by evidence on this record.

h. Summary as to Claim 1

Based on the preliminary record before us, Petitioner has established a reasonable likelihood that claim 1 would have been obvious over Fan, Jeong, and Du.

5. Independent Claims 13, 18, 30

Petitioner raises similar arguments for independent claims 13, 18, and 30 as for claim 1, identifying any pertinent differences. *See* Pet. 59–69. Patent Owner relies on its arguments for claim 1 for these claims. Prelim. Resp. 52–61. For similar reasons as discussed above, Petitioner has shown a reasonable likelihood that the combination of Fan, Jeong, and Du would have rendered claims 13, 18, and 30 obvious.

6. *Dependent Claims 2–5, 8–12, 14–17, 19–22, 25–29, 31–34*

Petitioner contends that dependent claim 2–5, 8–12, 14–17, 19–22, 25–29, and 31–34 would have been obvious over the combination of Fan, Jeong, and Du. Pet. 54–59, 62–63, 66–67, 69. Petitioner provides a detailed analysis explaining where the combination of Fan, Jeong, and Du discloses the limitations in these dependent claims, which Patent Owner does not contest at this preliminary stage. Based on the current record, we determine that Petitioner has demonstrated a reasonable likelihood that the combination of Fan, Jeong, and Du would have rendered obvious claims 2–5, 8–12, 14–17, 19–22, 25–29, and 31–34.

IV. CONCLUSION

At this stage of the proceeding, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its challenges to claims 1–34. At this preliminary stage, we have not made a final determination as to the patentability of the challenged claims or any underlying factual and legal issues.

V. ORDER

It is, therefore,

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–34 of the '150 patent is instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this Decision.

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Patent 10,285,150 B2

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