

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD. and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

EQUO IP LLC,
Patent Owner.

IPR2021-00943
Patent 10,517,120 B2

Before PATRICK M. BOUCHER, TERRENCE W. McMILLIN, and
JASON M. REPKO, *Administrative Patent Judges*.

REPKO, *Administrative Patent Judge*.

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

I. INTRODUCTION

Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Petitioner”) filed a petition to institute *inter partes* review of claims 1, 5–9, 11, 12, 16–20, and 22 of U.S. Patent No. 10,517,120 B2 (Ex. 1001, “the ’120 Patent”). Paper 2 (“Pet.”). Evolved Wireless, LLC (“Patent Owner”)¹ filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

On December 1, 2021, we instituted an *inter partes* review of all challenged claims based on all grounds in the Petition. Paper 9 (“Inst. Dec.”). Patent Owner filed a Response. Paper 17 (“PO Resp.”). Petitioner filed a Reply. Paper 22 (“Reply”). Patent Owner filed a Sur-reply. Paper 29 (“Sur-reply”). An oral hearing was held on September 6, 2022. A transcript of that hearing has been entered into the record. Paper 34 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued under 35 U.S.C. § 318(a). For the reasons that follow, Petitioner has shown by a preponderance of the evidence that claims 1, 5–9, 11, 12, 16–20, and 22 are unpatentable.

A. Related Matters

Both parties identify the following as related matters: *Evolved Wireless, LLC v. Samsung Electronics Co. Ltd.*, 2:21-cv-00033 (E.D. Tex.); and *In the Matter of Certain LTE-Compliant Cellular Communication Devices*, Investigation No. 337-TA-1253, (ITC). Pet. 63; Paper 6, 2.

Patent Owner identifies *Evolved Wireless, LLC v. Motorola Mobility LLC*, 1:21-cv-00567 (N.D. Ill.) as a related matter. Paper 6, 2.

¹ In an update to the Patent Owner’s mandatory notices, Patent Owner identified the real party-in-interest as Equo IP LLC, who is the “owner by assignment of U.S. Patent No. 10,517,120.” Paper 31, 2. At oral argument, Patent Owner identified Equo IP as the new owner of the ’120 patent. Tr. 4.

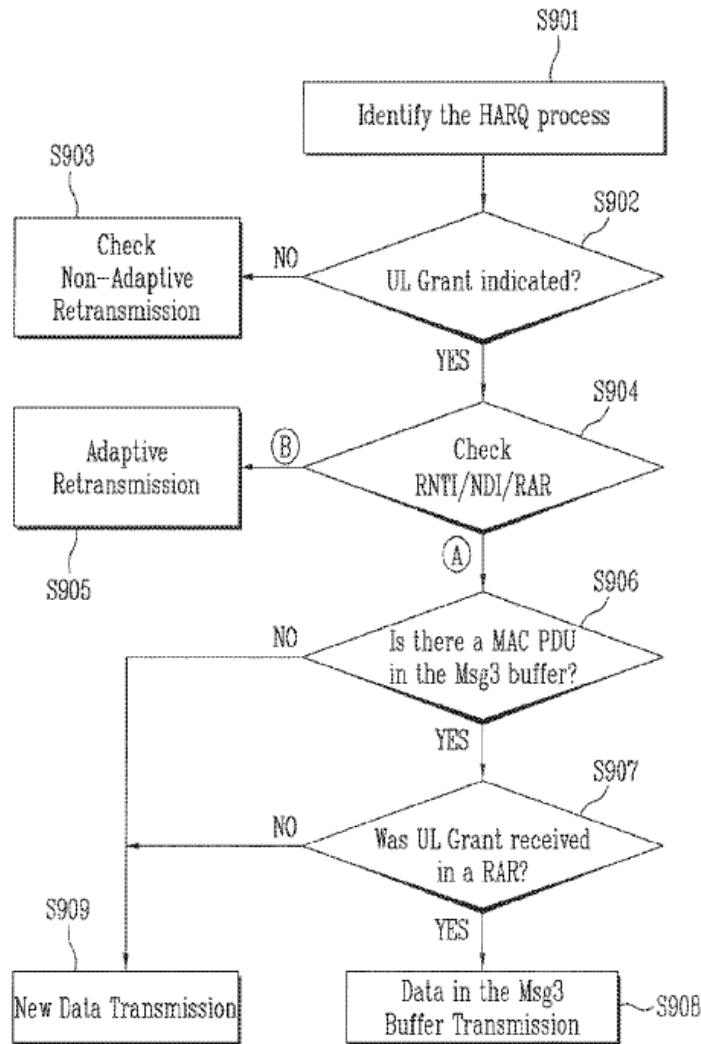
Petitioner further identifies *Evolved Wireless, LLC v. Samsung Electronics Co. Ltd.*, 15-cv-545 (D. Del.) as a related matter involving similar patents. Pet. 63.

B. The '120 Patent

The '120 patent relates to transmitting data stored in a Message 3 (Msg3) buffer in accordance with the Long Term Evolution (LTE) mobile-communication standard. Ex. 1001, 1:26–29. The '120 Patent describes a random-access procedure in which user equipment (UE) stores data for transmission via a third message in the Msg3 buffer and transmits the data when an uplink grant (UL Grant) signal is received. *Id.* at 1:47, 4:33–37. The patent discloses that, under the LTE standard at the time, if the UL Grant signal was received while the data was stored in the Msg3 buffer, the data would be transmitted regardless of a reception mode for the UL Grant signal. *Id.* at 4:41–45. According to the '120 Patent, this may create problems. *Id.* at 4:45–48.

Figure 9, below, shows a flowchart for transmitting uplink data by a UE according to the invention. *Id.* at 7:12–14.

FIG. 9



In step S902, the UE's HARQ² entity checks whether a UL Grant signal has been received from a base station (eNode B). *Id.* at 14:7–10. Later, in step S906, the UE determines whether there is data in the Msg3 buffer. *Id.* at 14:33–34. If there is data in the Msg3 buffer when receiving the UL Grant

² Hybrid Automatic Repeat Request. Ex. 1001, 5:51–52.

signal and the UL Grant signal has been received via a random-access response message (RAR), the UE transmits the Msg3 buffer data in step S908. *Id.* at 14:37–41. If there is no data in the Msg3 buffer when the UL Grant signal is received or the UL Grant signal is not received via an RAR, the UE determines that the eNodeB is requesting the transmission of new data, not the transmission of the Msg3 buffer data. *Id.* at 14:41–47.

C. Claims

Claims 1 and 12, below, are independent.

1. A method to transmit data by a user equipment through an uplink channel in a mobile communication system, the method comprising:

receiving an uplink grant (UL Grant) at the user equipment from a base station on a specific message; and

determining to not perform a retransmission ; and

further comprising:

transmitting, by the user equipment to the base station in accordance with the UL Grant received on the specific message, Message 3 (Msg3) buffer data when at least the UL Grant is received on the specific message, the specific message is the random access response message and there is data stored in a Msg3 buffer of the user equipment,

transmitting, by the user equipment to the base station, new data when at least the UL Grant is received on the specific message, the specific message is other than the random access response message and there is data stored in the Msg3 buffer of the user equipment,

transmitting, by the user equipment to the base station, new data when at least the UL Grant is received on the specific message, the specific message is other than the random access response message and there is no data stored in the Msg3 buffer of the user equipment, and

transmitting, by the user equipment to the base station, new data when at least the UL Grant is received on the specific message,^[3] the specific message is the random access response message and there is no data stored in the Msg3 buffer of the user equipment.

Ex. 1001, 17:20–48.

12. A system configured to transmit data by a user equipment through an uplink channel in a mobile communication environment comprising:

the user equipment receiving an uplink grant (UL Grant) from a base station on a specific message, the user equipment further determining to not perform a retransmission; and

further comprising:

the user equipment transmitting to the base station in accordance with the UL Grant received on the specific message, Message 3 (Msg3) buffer data when at least the UL Grant is received on the specific message, the specific message is the random access response message and there is data stored in a Msg3 buffer of the user equipment,

the user equipment transmitting to the base station new data when at least the UL Grant is received on the specific message, the specific message is other than the random access response message and there is data stored in the Msg3 buffer of the user equipment,

the user equipment transmitting to the base station new data when at least the UL Grant is received on the specific message, the specific message is other than the random access response message and there is no data stored in the Msg3 buffer of the user equipment, and

the user equipment transmitting to the base station new data when at least the UL Grant is received on the specific message,^[4] the specific message is the random

³ A certificate of correction dated December 24, 2019 deleted “random access response message” and inserted “specific message” in claim 1 at column 17, line 46.

⁴ A certificate of correction dated December 24, 2019 deleted “random access response message” and inserted “specific message” in claim 12 at column 18, line 48.

access response message and there is no data stored in the
Msg3 buffer of the user equipment.

Id. at 18:22–52.

D. Evidence

Name	Reference	Exhibit No.
300 reference	3GPP TS 36.300 v8.4.0 (2008-03), 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (EUTRAN); Overall description; Stage 2 (Release 8)	1002
321 reference	3GPP TS 36.321 v8.2.0 (2008-05), 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) Medium Access Control (MAC) Protocol Specification (Release 8)	1003
Ericsson	US 9,204,468 B2, issued Dec. 1, 2015	1004

Petitioner provides the Declaration of Paul S. Min. Ex. 1016.

Patent Owner provides the Declaration of Todor Cooklev, Ph.D.
Ex. 2013.⁵

⁵ The parties disagree about whether Dr. Cooklev’s opinion should be considered and whether he meets the definition of a POSITA. *See, e.g.*, Reply 10–11; Sur-reply 7–8. Although we consider Dr. Cooklev’s testimony as discussed *infra*, we accord it relatively little weight in our analysis for the specific reasons we discuss. If we were to discount Dr. Cooklev’s testimony entirely, as Petitioner urges, we would reach the same ultimate conclusions, such that we need not resolve whether Dr. Cooklev meets the definition of a POSITA. *See generally Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369 (Fed. Cir. 2022).

E. Asserted Ground

Claims Challenged	Pre-AIA⁶ 35 U.S.C. §	Reference(s)/Basis
1, 5–9, 11, 12, 16–20, 22	103(a)	300 reference, 321 reference, Ericsson

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner argues that a person of ordinary skill in the art (POSITA) “of the subject matter of the ’120 Patent would have had a master’s degree in electrical engineering with 2-3 years of experience in cellular communication systems, and would have been aware of the efforts of 3GPP and its various groups” or “that person would have had a Ph.D. in electrical engineering with the same familiarity with the work of 3GPP and its various groups.” Pet. 12 (citing Min Decl. ¶ 34).

Patent Owner provides a different definition:

The relevant field of art for the ’120 Patent is mobile cellular communication systems. A POSITA would have had a master’s level understanding of such systems, which would typically be obtained via a degree in electrical engineering, computer engineering, computer science, or a similar technical discipline with course and/or research work in mobile cellular communication systems and/or sufficient industry experience in mobile cellular communication systems. For example, this level of skill may be obtained via a master’s degree program with relevant course and/or research work or via a bachelor’s program with 4–5 years of related industry experience. Additionally, a POSITA would have been aware of the 3GPP and its work, which likely would come from industry experience. The level of ordinary skill in the art is not determined by a rigid formula.

⁶ Congress amended section 103 when it passed the Leahy-Smith America Invents Act (AIA). Pub. L. No. 112–29, § 3(c), 125 Stat. 284, 287 (2011). Here, the previous version of section 103 applies.

Thus, more course or research work could reduce the required level of industry experience, and vice versa. Similarly, significant course and/or research work or industry experience could substitute for a formal degree in a relevant technical discipline, and vice versa.

PO Resp. 44–45. Patent Owner claims that its definition is better than Petitioner’s because (1) it is not “based on a rigid formula that does not credit significant industry or research experience, which may substitute for formal academic work” and (2) it references additional degrees and coursework. *Id.* at 45. Patent Owner, though, does not explain how those differences affect the obviousness analysis in this case. *See id.*

Instead, Patent Owner argues that, “even under Samsung’s proposal, the level of ordinary skill in the art does not comport with Samsung’s assertion of obviousness” because the members of the 3GGP working groups were experts, not persons having ordinary skill. PO Resp. 56. That is, Patent Owner’s argument does not depend on the specific differences between the proposed definitions. *See id.* Rather, Patent Owner argues that Petitioner implicitly applies a level of skill that exceeds the ones proposed by either party. *See id.* We disagree with Patent Owner’s argument for the reasons discussed in Section II.C of this Decision.

We see no differences between the parties’ proposed definitions that would affect our analysis. Considering the full record developed during trial, including our review of the ’120 patent and the types of problems and solutions described there and in the cited prior art, we apply Petitioner’s definition in this Decision. Pet. 12. But our conclusion would be the same under Patent Owner’s.

B. Claim Construction

We need only construe terms that are in controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Claim 12 recites, in part,

the user equipment transmitting to the base station in accordance with the UL Grant received on the specific message, Message 3 (Msg3) buffer data when at least the UL Grant is received on the specific message, the specific message is the random access response message and there is data stored in a Msg3 buffer of the user equipment.

Ex. 1001, 18:27–33. Petitioner argues that claim 1 includes a similar limitation. Pet. 12. The parties refer to this limitation as [12d]. *See, e.g.*, PO Resp. 18; Reply 1.

Petitioner asserts,

The Board should construe these two related terms [in claims 1 and 12] such that this “transmitting” feature requires transmitting the Msg3 data *only* when the three claimed conditions are met: (1) the UL Grant is received on the specific message, (2) the specific message is the random access response message, and (3) there is data stored in a Msg3 buffer of the user equipment.

Pet. 12–13 (citing Ex. 1016 ¶¶ 56–57). In Petitioner’s view, the plain language supports the “only when” construction because “the only time after the UL Grant is received on the specific message that the user equipment transmits Msg3 buffer data is only when the specific message is the random access response message and there is data stored in a Msg3 buffer of the user equipment.” *Id.* at 13.

Patent Owner argues for a broader construction. PO Resp. 40; Sur-reply 1–7. In Patent Owner’s view, narrowing the claim by adding the word

“only,” as Petitioner proposes, is unnecessary. *Id.* Patent Owner argues that, in other IPRs involving a related patent (U.S. Patent No. 7,881,236),⁷ the word “only” clarified when the system transmits Message 3 data, but this is not needed here because the claim recites four transmitting limitations that cover all possible scenarios. PO Resp. 40. Patent Owner argues that Petitioner’s narrow construction is “an effort to introduce a potential non-infringement position” in this IPR. Sur-reply 5. In Patent Owner’s view, “No word or phrase from the challenged claims requires construction for resolution of this IPR.” PO Resp. 36; Sur-reply 4.

During the oral hearing, both parties agreed that we need not construe the claims to reach the unpatentability issues. *See* Tr. 43:14–17 (Patent Owner’s counsel); 64:18–22 (Petitioner’s counsel).

We need not resolve the dispute because Petitioner has shown that the claims are unpatentable under the narrower construction that adds the word “only.” *See supra* § II.C.

C. Obviousness

Petitioner asserts that claims 1, 5–9, 11, 12, 16–20, and 22 are unpatentable for obviousness over the 300 reference, the 321 reference, and Ericsson. *See* Pet. 4.

1. The 300 Reference and the 321 Reference

The 300 reference (Ex. 1002) and the 321 reference (Ex. 1003) are Third Generation Partnership Project⁸ (3GPP) technical specifications for the LTE (Long Term Evolution) standard as of March 2008 and June 2008.

⁷ U.S. Patent No. 7,881,236 was the subject of IPR2016-00757, IPR2016-01228, IPR2016-01229, and IPR2016-01345.

⁸ The 3GPP is a standard-setting organization with members from many telecommunication organizations. Min Decl. ¶ 35.

See Min Decl. ¶¶ 61–63. The 3GPP’s specification groups define parts of the LTE standard. *Id.* ¶ 36. Technical Specification Group Radio Access Network (TSG RAN) is the group that is relevant to the technology here. *Id.* Within TSG RAN, Working Group 2 (WG2 or “Working Group”) was responsible for developing LTE’s random-access procedure (RAP). *Id.* ¶ 37.

The RAP is used in a process for obtaining radio resources. *See* Cooklev Decl. ¶¶ 65–72. To transmit data, user equipment (UE), such as a cellular device, needs allocated radio resources. *Id.* ¶ 65. Radio resources include time intervals and frequencies. *Id.* An uplink grant (UL Grant) is a way for the UE to receive a radio-resource allocation from the base station (eNodeB). *Id.* ¶ 66. The UE receives a UL Grant through the RAP. *Id.* ¶ 69.

The 300 reference shows the four steps of the RAP. *See* Ex. 1002, Fig. 10.1.5.1-1. The relevant part of the 321 reference focuses on how the RAP proceeds in a particular protocol layer. *See* Ex. 1003 §§ 5.1, 5.4.1, 5.4.2.1.

2. *Ericsson*

Ericsson describes a user terminal in an LTE system. Ex. 1004, 3:50–65. Figure 6 below shows Ericsson’s transceiver. *Id.* at 3:45–46.

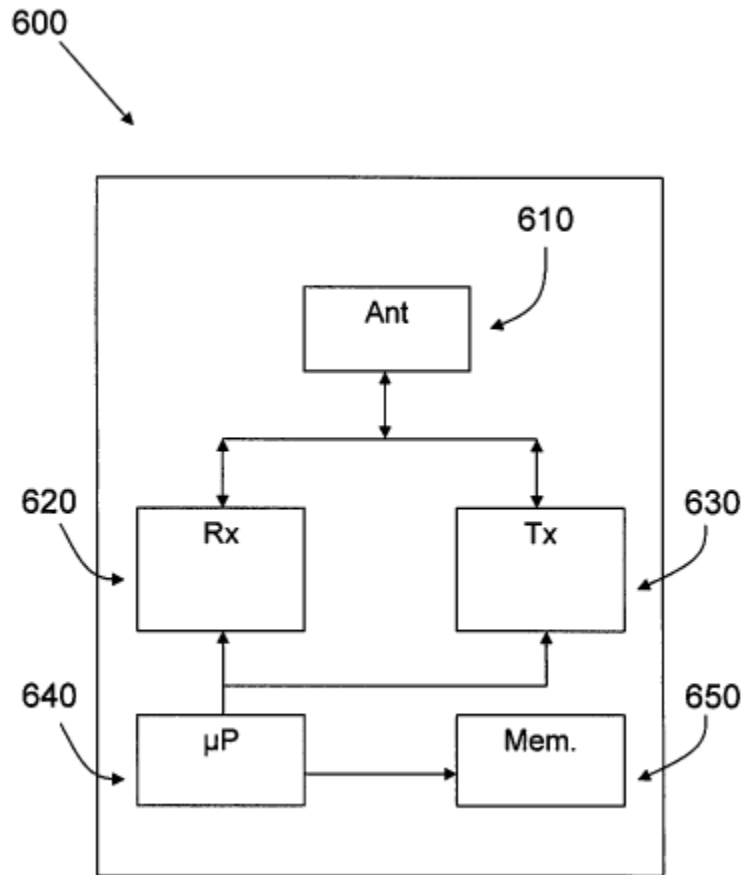


Figure 6, above, is a block diagram of transceiver 600 used as a user terminal. *Id.* at 7:24–25. Transceiver 600 has antenna 610 and receiver 620 to receive an initiation message, such as Message 2, from the controlling node. *Id.* at 7:39–40.

3. Limitation [12d]

Claim 12 recites, in part, transmitting Message 3 buffer data when three conditions are met:

the user equipment transmitting to the base station in accordance with the UL Grant received on the specific message, Message 3 (Msg3) buffer data when at least [1] the UL Grant is received on the specific message, [2] the specific message is the random access response message and [3] there is data stored in a Msg3 buffer of the user equipment,

Ex. 1001, 18:30–37 (numbering added). The parties refer to this limitation as [12d]. *See, e.g.*, Pet. 28; PO Resp. 26.

a) The “only when” Construction

Petitioner’s “only when” construction of limitation [12d] “requires transmitting the Msg3 data *only* when the three claimed conditions are met.” Pet. 12–13 (citing Ex. 1016 ¶¶ 56–57) (emphasis added). We apply this construction in our analysis of limitation [12d] here. But even applying Patent Owner’s construction, i.e., omitting the word “only,” we determine that Petitioner has shown that claim 12 is unpatentable. *See supra* § II.B.

Petitioner asserts that the 300 and 321 references and the Ericsson patent teach limitation [12d]. Pet. 28–41 (citing Min Decl. ¶¶ 83–118). According to Petitioner, “The 321 reference was clear that a UE must transmit message 3 *when* it receives a random-access response.” *Id.* at 31. Petitioner asserts, though, “the 321 reference did not expressly state what must happen in a particular scenario where, during an ongoing random access procedure, a UE receives two uplink grants—one in a random access response, and the other on a PDCCH.” *Id.* Petitioner argues that “it would have been obvious to a POSITA to resolve any such potential ambiguity by transmitting message 3 data only when the UE receives a random access response.” *Id.* (citing Min Decl. ¶¶ 94–97). Petitioner asserts that the 300 reference teaches “the correct and well-known sequence for a random-access procedure, including that a UE must receive a random access response before it transmits message 3.” *Id.* at 33–34 (citing Min Decl. ¶ 102).

b) UL Grant in a Random-Access Response

Patent Owner argues that the presence of an ongoing random-access procedure (RAP) does not mean that the UL Grant was received in a

random-access response (RAR). PO Resp. 49–50; Sur-reply 10. Patent Owner argues that Petitioner’s position is a result of hindsight bias. Sur-reply 13–14. In Patent Owner’s view, Petitioner “misreads the language of the draft standard and ignores the development process.” PO Resp. 50. Patent Owner argues that a UL Grant could be received on the PDCCH during an ongoing RAP. *Id.* Patent Owner argues that “Version 8.2 of 36.321 explicitly states that the UE indicated a valid UL Grant whether it is received on PDCCH or in a RAR.” *Id.* at 50–51 (citing Ex. 1003 § 5.4.1; Cooklev Decl. ¶ 202).

We disagree with Patent Owner’s arguments. *See id.* Petitioner properly considers the 300 reference together with the 321 reference because the 300 reference describes a process not clearly documented by the 321 reference. Pet. 6. In particular, the 321 reference, individually, does not clearly describe whether a UE transmits Message 3 when it receives an uplink grant on a message other than an RAR. *See id.* But together the references show that (1) the Message 3 transmission occurs only if the RAP is ongoing and the Message 3 buffer has a MAC PDU and (2) Message 3 transmission requires a prior UL Grant received in an RAR. *See id.* at 34–35; Min. Decl. ¶ 104.

Specifically, the 321 reference states, “If the UE receives both a grant for its RA-RNTI and a grant for its C-RNTI, the UE may choose to continue with either the grant for its RA-RNTI or the grant for its C-RNTI.” Ex. 1003 § 5.4.1, *quoted in* Pet. 32. The 321 reference calls the RA-RNTI grant an UL Grant in an RAR and calls the C-RNTI grant the UL Grant in a PDCCH. *See, e.g., id.* §§ 3.1 (“UE shall monitor the PDCCH after the uplink message containing the C-RNTI MAC”), 4.5.2

(“RA-RNTI for Random Access Response on DL-SCH”), *cited in* Min Decl. ¶ 99. Dr. Min testifies that, in the 321 reference, the UE chooses either the UL Grant received in an RAR or the UL Grant received in a PDCCH. Min Decl. ¶ 95.

But, according to Dr. Min, the 321 reference clearly indicates that UL Grant received in the RAR is the correct one to use during the RAP. *Id.* ¶ 96. Dr. Min explains that the 321 reference teaches that the UE processes the received UL Grant value after successfully receiving RARs, but the 321 reference is silent about looking for a grant in a PDCCH during the RAP. *Id.* (citing Ex. 1003 § 5.1.4; Ex. 1045, TS 36.213 v8.3.0, § 6.1). Dr. Min testifies that a UL Grant received in a PDCCH during a RAP “would be highly unreliable” and should be discarded. *Id.* ¶ ¶ 96-97. So the 321 reference alone provides strong evidence supporting Petitioner’s assertion that it would have been obvious to transmit Message 3 only when (1) Message 3 data was available to transmit and (2) the UE had received an UL Grant in an RAR. *See* Pet. 35.

To the extent that the language of the 321 reference is ambiguous on this point, reading the 321 reference together with the 300 reference provides ample support for the Petition’s obviousness rationale. *Id.* at 33–34. Petitioner asserts that the 300 reference shows “the correct and well-known sequence for a random-access procedure”—i.e., the UE receives an RAR before it transmits Message 3. *Id.* (citing Min Decl. ¶ 102). Petitioner relies on a figure from section 10.1.5.1, reproduced below, to show that the UE

receives an RAR before it transmits Message 3. *Id.* at 34 (citing Ex. 1002, 48, § 10.1.5.1).

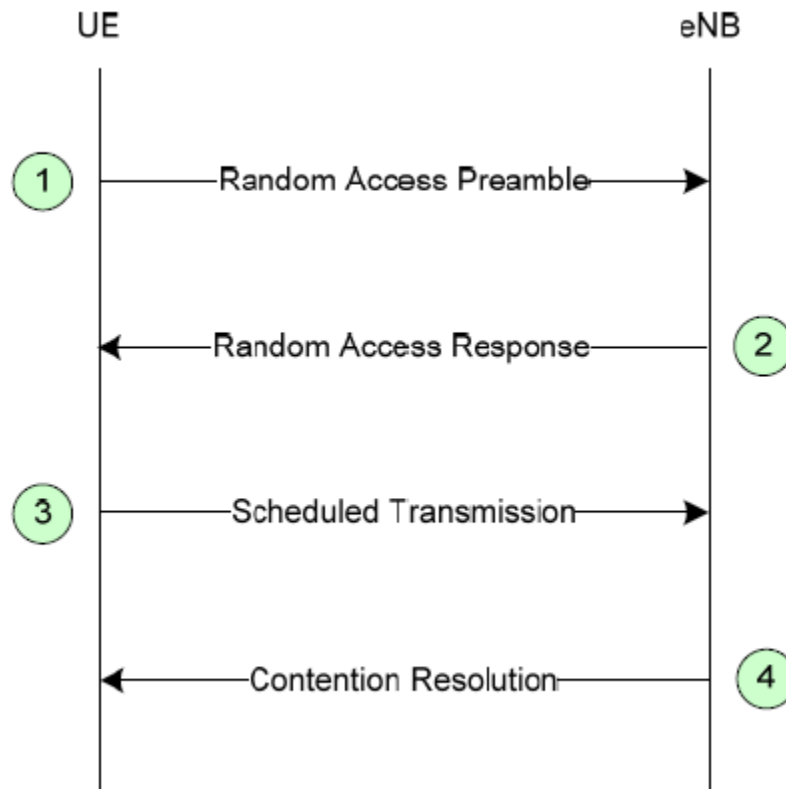


Figure 10.1.5.1-1, above, from the 300 reference, shows the UE and eNB communicating during the four steps of a contention-based RAP. Ex. 1002, 48.

We agree with Petitioner’s analysis. Pet. 32. In step 2, the figure above shows that the eNodeB sends the RAR to the UE. Ex. 1002, 48. The RAR conveys the initial UL Grant. *Id.* at 49. In step 3, the figure above shows that the UE transmits the scheduled transmission to the eNodeB. *Id.* According to Petitioner, Message 3 is the scheduled transmission. Pet. 34.

This diagram and accompanying description support Petitioner’s assertion that “the eNode B sends the UE a random-access response grant, and the UE responds with a message 3 transmission that depends on the random-access response grant.” *Id.* In this way, the 300 reference adequately

supports Petitioner’s obviousness rationale and Dr. Min’s supporting testimony. *Id.* at 32–35. Thus, we credit Dr. Min’s testimony on this issue. Min Decl. ¶¶ 98–104.

Patent Owner argues that Petitioner claims that there was no problem with the standard and ignores the development process. *See, e.g.*, PO Resp. 50, 56; Sur-reply 10–12 (citing Ex. 1052, 31:10–17, 32:5–20, 33:22–34:11). We disagree. Petitioner expressly acknowledges the 321 reference’s ambiguity. *See, e.g.*, Pet 21; Reply 20–21. Petitioner, though, asserts that “the potential lack of clarity in the 321 reference (Section IX.A.3.d) does not affect whether a POSITA would have consulted the 300 and 321 references together.” Pet. 21.

According to Petitioner, “A POSITA would have consulted the two complementary references together because both specifications were part of the then-current LTE standard, which they considered as one collective reference set.” *Id.* at 20. Petitioner’s view here is supported by Patent Owner’s evidence. For example, Patent Owner argues that the 300 reference is a “high-level overview,” and the 321 reference is a “companion specification.” PO Resp. 45–46.

In Patent Owner’s view, however, “a POSITA would look to the ’321 Reference—not to the ’300 Reference—for a detailed description of the standard and to base an implementation of the network architecture.” *Id.* at 46 (citing Cooklev Decl. ¶ 183). According to Patent Owner, Petitioner’s position is flawed because it gives more technical weight to the high-level overview than to the companion technical document. *Id.*; Sur-reply 13.

Patent Owner argues that the Petition’s argument “is flawed because it represents an improper use of hindsight in a deliberate attempt to fish for

disclosure in the prior art based on the teachings of the '120 Patent rather than through a POSITA's understanding of the art." PO Resp. 57; Sur-reply 12–13. According to Patent Owner, Petitioner "is forced to misrepresent the actual teachings of the alleged prior art" and "ignores the requirement to base an obviousness analysis on the scope and content of the art itself." PO Resp. 57.

Yet it is undisputed that the 300 and 321 references are related. *See id.* at 45–46. So it is reasonable to read them together and view the teachings of the 321 reference in the context of the "high-level overview" presented in the 300 reference, as described in the Petition. *See, e.g.,* Pet. 4–6. Petitioner's rationale does not require choosing between the two references or favoring one over the other, as Patent Owner's argument suggests. *See* PO Resp. 45–46. In fact, the evidence cited in Patent Owner's Response tends to favor Petitioner's position because it expressly describes how the references are related and why a POSITA would have viewed them as "companion" technical documents. *See id.* (citing Ex. 1002, 11; Cooklev Decl. ¶¶ 182–186). We see no evidence of hindsight bias or misrepresentation. *See* PO Resp. 55–57; Sur-reply 12–13.

Petitioner's evidence also shows that the 321 reference should be read in the context provided by the 300 reference—not in isolation. *See* Pet. 21. For example, the 300 reference cites TS 36.321, and states that it "contain[s] provisions which, through the reference in this text, constitute provisions of the present document." Ex 1002 § 2, *quoted in* Pet. 21. The 321 reference became its current version in June 2008. Min ¶ 165. This is consistent with the evidence about "companion" documents that Patent Owner provided in

its response. PO Resp. 45–46 (citing Ex. 1002, 11; Cooklev Decl. ¶¶ 182–186).

Generally, Patent Owner’s arguments and Dr. Cooklev’s corresponding testimony do not give sufficient weight to the 300 reference. *See id.* at 49–52. Rather, they are heavily focused on what the 321 reference alone expressly teaches or suggests. *See id.*; Cooklev Decl. ¶¶ 140–148, 180–181. Because Petitioner relies on the 300 reference together with the 321 reference in its obviousness rationale, we disagree with these arguments (PO Resp. 49–52), and we give little weight to Dr. Cooklev’s corresponding testimony on this issue (Cooklev Decl. ¶¶ 140–148, 180–181).

c) Experts versus a POSITA

Patent Owner notes that “both parties agree that the members of the 3GPP Working Groups were experts in the field—with more expertise and understanding than a POSITA.” PO Resp. 49 (emphasis added). Dr. Cooklev testified, “I disagree that a POSITA—who under all accounts would have less expertise than the members of the 3GPP Working Groups—would recognize a problem and believe that the solution was obvious when the Working Group members themselves struggled with the same issue.” Cooklev Decl. ¶ 194, *cited in* PO Resp. 49. Patent Owner argues that Petitioner’s obviousness analysis relies on the skill level of an expert, not a POSITA. PO Resp. 56.

Patent Owner, though, provides insufficient evidence to support the assertion that the Working Group members struggled with this issue. *See id.* at 49. To the contrary, the background knowledge, reflected in the 300 reference, demonstrates that, in the RAP, the UE must receive a RAR before it transmits Message 3. *See*, Pet. 33–34 (citing Min Decl. ¶ 102; Ex. 1002,

§ 10.1.5.1). Also, the proposed change to section 36.321 was characterized as “correction” (category F), instead of an “addition of feature” (category B) or a “functional modification of feature” (category C). Ex. 1011, 1. The “reason for change” in Qualcomm’s change request also lacks any indication of a struggle:

According to the original intention, it is clarified that the transmission of the RACH Msg3 performed only in response to an uplink grant in the Random Access Response. The current specification also allows transmission of Msg3 in response to UL grant on PDCCH.

Ex. 2006, 1 (emphasis added). Notably, the change request, above, uses the phrases “[a]ccording to the original intention” and “it is clarified.” See PO Resp. 15–16. Thus, Dr. Cooklev’s assertions about the Working Group’s struggles are not consistent with this part of the record and are not otherwise supported. Cooklev Decl. ¶ 194.

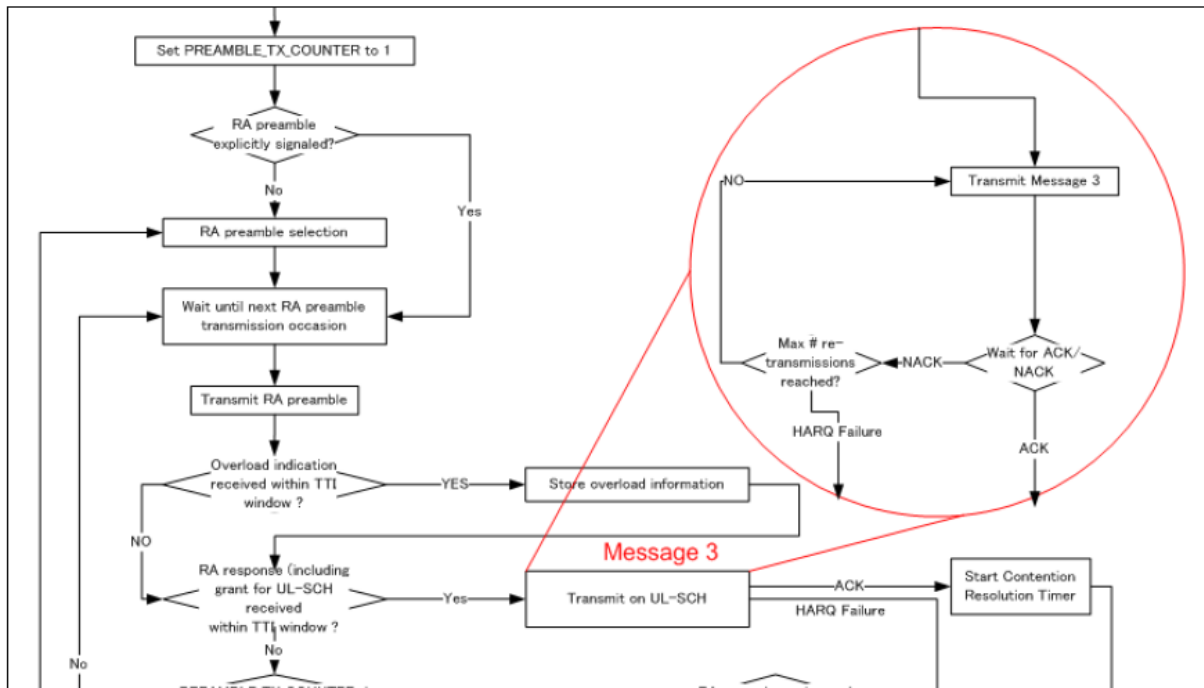
Because we see little evidence to suggest that the Petition relies on a definition of a POSITA that exceeds the level of skill possessed by the members of the Working Group, we disagree with Patent Owner that Petitioner’s obviousness analysis is flawed in this way, and we assign little weight to Dr. Cooklev’s testimony on this issue. See PO Resp. 49; Cooklev Decl. ¶¶ 193–194.

d) Dahlman Textbook and 3GPP WG2 Submission

To further support its arguments about what a person of ordinary skill in the art would have known, Petitioner provides the Dahlman textbook and a submission to the 3GPP WG2. Pet. 35–37. According to the Dahlman textbook, “In the third step, the terminal transmits the necessary messages to the eNodeB using the resources assigned in the random-access response in the second step.” Ex. 1036, 16 (§ 17.2.3 Step 3: Termination Identification),

quoted in Pet. 36. This further supports Petitioner’s position that the UE must receive a random-access response before sending Message 3. See Pet. 36; Min Decl. ¶ 106.

Also, Petitioner provides a flowchart from the March 2008 submission to WG2 from Philips that documents the RAP, which is reproduced in part below:



Pet. 36 (citing Ex. 1005, 2). The flow chart, above, shows a decision block in the lower left: “RA response (including grant for UL-SCH[)] received within TTI window?” *Id.* The flow chart indicates that, if this is true, “Transmit on UL-SCH.” *Id.* Dr. Min explains that this transmission is where the UE transmits Message 3. Min Decl. ¶ 108, *cited in* Pet. 37. The flow chart shows no other way to reach the “Transmit on UL-SCH” step. Pet. 37.

Patent Owner argues that the Dahlman textbook and the Philips submission merely describe the general RAP, without mentioning the Message 3 buffer or a UL Grant on PDCCH. PO Resp. 47–48. In Patent

Owner's view, Dahlman teaches that Message 3 data may be sent if there is an ongoing RAP, but Dahlman does not say what happens when there is an ongoing RAP, there is data in the Message 3 buffer, and the UL Grant is received on PDCCH. *Id.* (citing Cooklev Decl. ¶ 188). Also, Patent Owner argues that the Philips submission—like the 300 reference and Dahlman book—is silent about the scenario addressed by the '120 Patent. *Id.* at 47–48 (citing Cooklev Decl. ¶ 189). According to Patent Owner, the problem was not obvious because the Dahlman textbook and Philips submission “presupposed that the UL Grant would be received in a Msg2 RAR” and “do not at all address the possibility that an UL Grant could be received in another way while data was stored in the Msg3 buffer and a RAR was ongoing.” *Id.* at 48 (citing Cooklev Decl. ¶ 190).

We disagree. If the Message 3 responds to a non-RAR grant, the RAP would not complete properly. Ex. 1052, 34:14–22. By contrast, the Dahlman textbook and the Philips submission describe a procedure that would complete properly. *See* Ex. 1005, 2; Ex. 1036, 16. Specifically, those procedures require a UL Grant in a RAR before transmitting the Message 3 data. *See* Ex. 1005, 2; Ex. 1036, 16. So, to the extent that the 321 reference is unclear about which procedures would complete properly, we agree with Petitioner that the Dahlman textbook and the Philips submission provide additional background knowledge on that issue. Pet. 37.

Although Patent Owner faults the references for being silent about a UL Grant received on a PDCCH (PO Resp. 47), the Philips submission's flow chart describes a sequence of necessary conditions, not every possible event. Ex. 1005, 2. Specifically, the flow chart indicates that “RA response (including grant for UL-SCH[]) received within TTI window?,” not a UL Grant on the PDCCH, is a necessary condition for the disclosed transmitting

step. *Id.* We agree with Petitioner that this means that the UE should transmit Message 3 only if it received the RAR message. Pet. 37. We credit Dr. Min’s testimony on this point. Min Decl. ¶ 108.

In view of the 300 reference, the submitted correction (Ex. 1011), the Dahlman textbook, and the 3GPP WG2 submission (Ex. 1005), showing the background knowledge, we disagree with Patent Owner’s arguments about these references (PO Resp. 47–48), and we accord Dr. Cooklev’s testimony on this issue little weight (Cooklev Decl. ¶¶ 188–190).

e) Simultaneous Development

As an alternative to its principal analysis, Petitioner contends that there is evidence of near-simultaneous development of the “only when” feature of the 321 reference, and that such simultaneous development “strongly supports obviousness.” Pet. 37 (citing *Geo M. Martin Co. v. Alliance Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1306 (Fed. Cir. 2010)). We agree with Petitioner that there is evidence of near-simultaneous development of the feature here. *Id.* at 37–39.

Just weeks after the 321 reference was released, two 3GPP members proposed an edit to the 321 reference within three hours of each another. *Id.* As discussed above, the 321 reference was unclear about whether the UE may transmit Message 3 in response to a grant in a PDCCH. *Id.* at 20–21. But LG and Qualcomm submitted proposals to clarify this. *Id.* at 38.

The earliest priority date for the challenged patent is August 11, 2008. Ex. 1001, code (60). LG proposed the following on August 12, 2008:

It is proposed to that only when a new UL grant is indicated in a Random Access Response, the HARQ entity instructs the HARQ process to store a MAC PDU stored in [Message 3] buffer in HARQ buffer.

Ex. 1010, 3 (R2-084387); Min ¶ 42. LG proposed the following change to the language:

- if an uplink grant for this TTI has been received in a Random Access Response~~there is an ongoing Random Access procedure~~ and there is a MAC PDU in the [Message 3] buffer:
 - obtain the MAC PDU to transmit from the [Message 3] buffer.

Ex. 1011, 2 (proposed language in red underline and removed language in red strikethrough, as in original). Within three hours (Min Dec. ¶ 42), Qualcomm made its proposal:

HARQ should obtain the MAC PDU to transmit from the [Message 3] buffer only in response to UL grant in a Random Access Response.

Ex. 1008, 2 (R2-084156) (bracketing in original). Qualcomm proposed the following change to the language:

- if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message 3] buffer and the uplink grant was received in a Random Access Response:
 - obtain the MAC PDU to transmit from the [Message 3] buffer.

Id. at 5 (proposed language in red underline with yellow highlighting, as in original, bracketing in original). That is, both proposals were submitted within a day of the challenged patent's claimed priority date. Pet. 37–39; Reply 17; Min Decl. ¶ 42. Both add that the UL Grant must be received in the RAR. *See* Exs. 1008, 1010. The proposals use the language “only when” and “only in response” to further clarify that this condition is required. *See* Exs. 1008, 1010. The evidence shows that those making the proposals merely clarified a sentence in one part of the existing standard. *See* Pet. 7. Indeed, Qualcomm characterized its submission in this way:

According to the original intention, it is clarified that the transmission of RACH Msg3 performed only in response to an uplink grant in the Random Access Response. The current specification also allows transmission of Msg3 in response to UL grant on PDCCH

Ex. 2006, 1 (R2-085833) (emphasis added). Such a clarification “according to the original intention” is not fairly characterized as a distinct invention. *See id.* Also, the Working Group debated whether this change was needed at all. *See, e.g.*, Tr. 57:4–15; 34:5–16. Essentially, Qualcomm and LG “identified *the language* as a problem.” PO Resp. 50 (emphasis added). This evidence bolsters Petitioner’s argument that the meaning of a particular sentence in the 321 reference is apparent when the entire description of the RAP in the 300 reference is considered. *See, e.g.*, Pet. 31.

Patent Owner views this record differently: The ambiguity in the 321 reference, the Dahlman textbook, the Philips submission, and the LG-Qualcomm change proposals show a lack of awareness of the problem. *See, e.g.*, PO Resp. 13–20, 47–48; Sur-reply 12–14. In other words, Patent Owner argues that the fact that the 321 reference, Dahlman textbook, and the Philips submission were all silent on the subject matter in the change proposals indicates that others did not recognize a problem that the inventors did. *Id.* at 47–48 (citing Cooklev Decl. ¶ 189).

But, even accepting Patent Owner’s view, Qualcomm recognized the problem and proposed a similar solution within three hours. *See* Ex. 1008. The fact that the proposals were not jointly made favors Petitioner’s assertion that they were also independent. *See id.* So, assuming that the problem in the standard was not recognized, we agree with Petitioner (Pet. 37–39) that the LG and Qualcomm change proposals are independent, simultaneous developments made within a comparatively short space of

time, and thus, the change proposals are persuasive evidence that the claimed solution was the product only of ordinary skill. *See Geo M. Martin Co.*, 618 F.3d at 1305.

But we emphasize that, even without Petitioner’s evidence of simultaneous development, we determine that Petitioner has sufficiently shown that the 321 and 300 references teach or suggest limitation [12d] under Petitioner’s principal analysis for all the reasons discussed above. *See* Pet. 20–23, 37–39. For those reasons, the Petition provides articulated reasoning with some rational underpinning to support its legal conclusion of obviousness. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

4. *Limitations [12e], [12f], and [12g]*

Claim 12 recites transmitting new data when three conditions are met:

the user equipment transmitting to the base station new data when at least [1] the UL Grant is received on the specific message, [2] the specific message is other than the random access response message and [3] there is data stored in the Msg3 buffer of the user equipment.

Ex. 1001, 18:38–42 (numbering added). The parties refer to this limitation as [12e]. *See, e.g.*, Reply 11; PO Resp. 26.

Petitioner explains that the 321 reference discloses making a new-data transmission when the three conditions recited in limitation [12e] are met. Pet. 41–42. An excerpt from the 321 reference is reproduced below with line numbers added by Petitioner.

1	When the UE has a C-RNTI, Semi-Persistent Scheduling C-RNTI, or Temporary C-RNTI, the UE shall for each TTI:
2	- if an uplink grant for this TTI has been received on the PDCCH for the UE's C-RNTI or Temporary C-RNTI; or
3	- if an uplink grant for this TTI has been received in a Random Access Response:
4	- indicate a valid uplink grant and the associated HARQ information to the HARQ entity for this TTI.
5	At a given TTI, if an uplink grant is indicated for the TTI, the HARQ entity identifies the HARQ process for which a
6	transmission should take place.
7	At the given TTI, the HARQ entity shall:
8	- if an uplink grant indicating that the NDI has been incremented compared to the value in the previous
9	transmission of this HARQ process is indicated for this TTI or if this is the very first transmission for this HARQ
10	process (i.e. a new transmission takes place for this HARQ process):
11	- if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer:
12	- obtain the MAC PDU to transmit from the [Message3] buffer.
13	- else, if the "uplink prioritisation" entity indicates the need for a new transmission:
14	- obtain the MAC PDU to transmit from the "Multiplexing and assembly" entity;
15	- instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified
16	parameters.

Id. at 19 (reproducing Ex. 1003 §§ 5.4.1, 5.4.2.1).

As for the first condition, Petitioner asserts that lines 2 and 4, above, teach that the UE delivers the UL grant on the PDCCH to the HARQ entity.

Id. at 42 (citing Ex. 1003 § 5.4.1; Min Decl. ¶ 121). As for the second and third conditions, Petitioner asserts that, in line 11, the HARQ entity determines “if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message 3] buffer,” but if not, new data is transmitted. *Id.* Specifically, the Petition explains that the 321 reference teaches that new data is transmitted because the HARQ entity obtains the MAC PDU (line 14) and instructs the HARQ process to trigger a new transmission using the identified parameters (lines 15 and 16). *Id.*

As to the second and third conditions, Patent Owner argues that it is possible to have an ongoing RAP without data in the Message 3 buffer. PO Resp. 52. Patent Owner argues that, according to Dr. Cooklev,

Line 11 is a conditional statement with two conditions: (1) ongoing RAP and (2) data in the Msg3 buffer. If any one of these

conditions is false—but not both—the MAC PDU to transmit will be obtained from the Multiplexing and Assembly Entity.

Id. (citing Cooklev Decl. ¶ 211).

First, as discussed with limitation [12d], Petitioner has shown that it would have been obvious to transmit Message 3 data only when the UL Grant was received in the RAR. *Supra* § II.C.3. The Petition’s analysis of limitation [12e] should be viewed in that context.

Even so, Dr. Cooklev’s interpretation of the conditional statement in line 11 is unclear and its relevance to the claim limitation at issue is not apparent. Cooklev Decl. ¶ 211. Dr. Cooklev does not explain why if both conditions on line 11 are false, the process goes to line 12. *Id.* That is, Dr. Cooklev and Patent Owner appear to be arguing that two false conditions in line 11 evaluate to true (“any one of these conditions is false—but not both . . .”), but one false and one true condition evaluates to false. *Id.* It is unclear if Dr. Cooklev’s interpretation applies to the 321 reference as written and how this relates to limitation [12e]. *Id.* Thus, we assign Dr. Cooklev’s testimony on this issue little weight. *Id.* For at least this reason, we disagree with Patent Owner’s argument based on this testimony. PO Resp. 52.

But, even if Dr. Cooklev is correct that it is possible to have an ongoing RAP without data in the Message 3 buffer, it would not be inconsistent with Petitioner’s assertion that the 321 reference teaches that new data is transmitted when data is in the Message 3 buffer, but there is no ongoing RAP, as required by the claim. Reply 12. If correct, Dr. Cooklev simply identifies another possible outcome—i.e., an ongoing RAP without data in the Message 3 buffer. Cooklev Decl. ¶ 211. Yet “combinations of prior art that sometimes meet the claim elements are sufficient to show obviousness” *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002 (Fed.

Cir. 2016). For example, in *Unwired Planet*, it was “enough that the combination would sometimes perform all the method steps.” *Id.* Here, even if the 321 reference teaches more options than what the claim limitation requires (*see* PO Resp. 52; Cooklev Decl. ¶ 211), we agree with Petitioner that it at least teaches what is required by the claim—i.e., the step of sending new data, instead of Message 3 data, when the three conditions recited in limitation [12e] are met. *See* Pet. 41–42. We credit the Min Declaration on this issue. *See* Min Decl. ¶¶ 120–121. For this additional reason, we disagree with Patent Owner’s argument about limitation [12e]. PO Resp. 51–52.

Furthermore, Patent Owner’s argument about limitation [12e] concerns an “ongoing RAP without data in the Message 3 buffer.” *Id.* at 52. Limitations [12f] and [12g] recite the condition when “there is no data stored in the Msg3 buffer of the user equipment.” Patent Owner summarizes the claimed scenarios in a table:

How was the UL Grant Received?		
Is there Data in the Msg3 Buffer?	PDCCH	Random Access Response Message
YES	Send New Data Elements [1e] & [12e]	Send Msg3 Data Elements [1d] & [12d]
NO	Send New Data Elements [1f] & [12f]	Send New Data Elements [1g] & [12g]

Id. at 27. In addressing limitation [12f], Petitioner explains what happens when the UE delivers the uplink grant on the PDCCH (condition 1) and there is no Message 3 buffer data:

The random access procedure is not ongoing (condition 2), and no MAC PDU is in the Message3 buffer (condition 3), so the HARQ entity would “obtain the MAC PDU to transmit from the ‘Multiplexing and assembly’ entity” in line 14 and “instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified parameters” in lines 15 and 16, which constitutes “transmitting new data to the base station.”

Pet. 43 (citing Min Decl. ¶ 123). Likewise, in addressing limitation [12g], Petitioner explains what happens when the UE delivers the uplink grant on the RAR (condition 1) and there is no Message 3 buffer data:

Then, after performing several steps in lines 5-10, the HARQ entity determines “if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer” in line 11. (*Id.*) In this scenario, although the random access procedure is ongoing (condition 2), there is no MAC PDU in the Message3 buffer (condition 3), so the HARQ entity would “obtain the MAC PDU to transmit from the ‘Multiplexing and assembly’ entity” in line 14 and “instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified parameters” in lines 15 and 16, which constitutes “transmitting new data,” as claim 12 recites.

Id. at 44–45 (citing Min Decl. ¶ 125). Apart from the discussion of the situation where there is no data in the Message 3 buffer (PO Resp. 52) and the arguments about obviousness that we addressed above (*see supra* § II.C.3), Patent Owner does not specifically rebut Petitioner’s arguments and evidence about limitations [12f] and [12g]. *See* PO Resp.; Sur-reply. We determine Petitioner’s arguments about limitations [12f] and [12g] are sufficiently supported by the record and credit Dr. Min’s testimony. *See* Pet. 43–45; Min Decl. ¶¶ 123–125.

Thus, Petitioner has shown that the proposed combination teaches or suggests limitations [12e], [12f], and [12g].

5. *The Remaining Limitations of claim 12*

We have reviewed the Petitioner's analysis of the remaining limitations not discussed above and not specifically addressed by Patent Owner. *See* PO Resp.; Sur-reply. Based on the complete record developed during this proceeding, we determine that Petitioner has shown that the combination of the 300 reference, the 321 reference, and Ericsson teaches or suggests those remaining limitations. *See* Pet. 19–45. The Petition provides articulated reasoning with some rational underpinning to support its legal conclusion of obviousness. *KSR*, 550 U.S. at 418. We credit Dr. Min's testimony, which is adequately supported by the record. Min Decl. ¶¶ 66–126.

Thus, Petitioner has shown by a preponderance of the evidence that claim 12 is unpatentable as obvious. *See* Pet. 18–45.

6. *The '236 Patent*

The patent challenged here is a continuation of U.S. Patent No. 7,881,236 ("the '236 patent"). Ex. 1001, code (63). The Board found that all claims of the '236 patent were unpatentable under the same art that is asserted here. *ZTE (USA) Inc. v. Evolved Wireless LLC*, IPR2016-00757, Paper 42, at 2 (PTAB Nov. 30, 2017). On appeal, the Board's decision was affirmed by the U.S. Court of Appeals for the Federal Circuit. *Evolved Wireless LLC v. ZTE (USA) Inc.*, 778 F. App'x 967, 968 (Fed. Cir. 2019) (Fed. Cir. R. 36).

Petitioner argues that the claims challenged here are similar to those that were found unpatentable in the previous IPR. *See, e.g.*, Pet. 2, 10. Patent Owner disagrees. *See* PO Resp. 28–29, 36–41; *see also* Sur-reply 9 (arguing that the limitation at issue was never presented to the Board).

This Decision is based on the arguments and evidence presented in the Petition, not the previous IPR. So we need not resolve the arguments about

the similarities between the unpatentable claims in the '236 patent and the claims at issue here. *See* PO Resp. 28–29, 36–41.

7. *The Prosecution History*

Patent Owner argues that, during prosecution of the '120 patent, the Examiner reviewed and considered the entire file from the previous IPR and references that are at issue in this IPR. *Id.* at 41–44; *see also* Sur-reply 15 (arguing “the examiner reviewed the cited art and issued the claims over it”).

The Institution Decision, however, addressed the prosecution history and explained why the Examiner erred in a manner material to the patentability of the challenged claims. *See* Inst. Dec. 8–12.

8. *Claim 1*

The Petition states, “Independent claim 1 is invalid.” Pet. 51. The Petition reproduces some of the limitations and repeats the sentence, “The prior art specifications taught this feature per section VIII.A.3.” *Id.* Section VIII.A.3 of the Petition presents the analysis of claim 12. *See id.* at 23.

Patent Owner argues that the Petition fails to address element [1e]. PO Resp. 52. According to Patent Owner, the “Petition skips from Element [1d] to Element [1f],” and “[t]here is no discussion whatsoever of Element [1e].” *Id.* Patent Owner argues that, because there is no analysis of element [1e], there is no *prima facie* case of obviousness for claim 1 or its dependent claims. *Id.* at 52–55.

We disagree. The Petition refers to the analysis of claim 12 when analyzing claim 1. Pet. 51. We agree with Petitioner because claim 1’s method recites the functions of the system recited in claim 12. *Compare* Ex. 1001, 17:20–48, *with id.* at 18:22–52. Petitioner repeated the basis for its

challenge to claim 1 six times. *See* Pet. 51–52. Repeating it a seventh time would not add anything more to the challenge.

Patent Owner argues that the limitations are similar but not the same. Sur-reply 14; *see also* PO Resp. 52–55. Patent Owner, though, does not explain how the differences cause Petitioner’s analysis of the limitations to be deficient. *See* Sur-reply 14; PO Resp. 52–55. Rather, Patent Owner also groups limitations [1e] and [12e] together in its analysis:

How was the UL Grant Received?		
Is there Data in the Msg3 Buffer?	PDCCH	Random Access Response Message
YES	Send New Data Elements [1e] & [12e]	Send Msg3 Data Elements [1d] & [12d]
NO	Send New Data Elements [1f] & [12f]	Send New Data Elements [1g] & [12g]

PO Resp. 27 (citing Cooklev Decl. ¶ 198). Thus, we agree with Petitioner that the limitations are similar enough that the same analysis applies, and the Petition, as filed, sufficiently shows that claim 1 is unpatentable as obvious over the 321 reference, the 300 reference, and Ericsson. *See* Pet. 51–52; Reply 21–22; *see also supra* § II.C.

9. Claims 5–9, 11, 16–20, and 22

Patent Owner does not present arguments specifically addressing Petitioner’s arguments and evidence directed to claims 5–9, 11, 16–20, and 22. PO Resp. Rather, Patent Owner argues that, “[b]ecause the independent claims are valid, each of the dependent claims is valid, as well.” *Id.* at 58.

We have reviewed the challenges to these claims. Based on our review of the arguments and evidence, we conclude that Petitioner demonstrates, by a preponderance of the evidence, that claims 5–9, 11, 16–20, and 22 are unpatentable under 35 U.S.C. § 103(a) over the 300 reference, the 321 reference, and Ericsson. Pet. 45–54. We credit Dr. Min’s testimony about these claims, which is adequately supported by the record. Min Dec. ¶¶ 127–173.

III. CONCLUSION

Petitioner has met its burden to show that claims 1, 5–9, 11, 12, 16–20, and 22 are unpatentable.⁹

Claim(s)	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 5–9, 11, 12, 16–20, 22	103(a)	300 reference, 321 reference, Ericsson	1, 5–9, 11, 12, 16–20, 22	

⁹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

IV. ORDER

It is

ORDERED that claims 1, 5–9, 11, 12, 16–20, and 22 of U.S. Patent 10,517,120 B2 are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to this proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2021-00943
Patent 10,517,120 B2

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