

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZTE (USA) INC., HTC CORPORATION, HTC AMERICA, INC.,
SAMSUNG ELECTRONICS CO., LTD., AND SAMSUNG
ELECTRONICS AMERICA, INC.,
Petitioners,

v.

EVOLVED WIRELESS LLC,
Patent Owner.

Case IPR2016-00757
Case IPR2016-01345¹
Patent 7,881,236 B2

Before WILLIAM V. SAINDON, PATRICK M. BOUCHER, and
TERRENCE W. McMILLIN, *Administrative Patent Judges*.

McMILLIN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

¹ These cases have been consolidated. Unless otherwise indicated, citations are to the record of IPR2016-00757.

In response to a Petition (Paper 3, “Pet.”) filed by ZTE (USA) Inc., HTC Corporation, and HTC America, Inc., (collectively, “Petitioner”), we instituted an *inter partes* review of claims 1–10, 12, and 13 of U.S. Patent No. 7,881,236 B2 (“the ’236 patent”). Paper 11 (“Dec.”), 19. Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc., filed a Petition in IPR2016-01345 that was substantially identical to the Petition in this proceeding, and trial was instituted in IPR2016-01345 on the same grounds as in this proceeding. Paper 12, 2. Therefore, IPR2016-01345 was consolidated with this proceeding. *Id.* During the trial, Evolved Wireless LLC (“Patent Owner”) timely filed a Response (Paper 22, “PO Resp.”), to which Petitioner timely filed a Reply (Paper 28, “Reply”). An oral hearing was held on August 8, 2017, and a copy of the transcript was entered into the record. Paper 36 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has shown, by a preponderance of the evidence, that claims 1–10, 12, and 13 are unpatentable.

I. BACKGROUND

A. *The ’236 Patent*

The ’236 patent “relates to a mobile communication technology.” Ex. 1001, col. 1, ll. 17–18. In particular, the patent describes a random access procedure for user equipment (“UE”) and a base station in a telecommunication system. *Id.* at col. 3, ll. 42–59. Figure 1 of the ’236 patent illustrates a particular example of such a telecommunication system—

the Evolved Universal Mobile Telecommunication System (“E-UMTS”), and is reproduced below.

FIG. 1

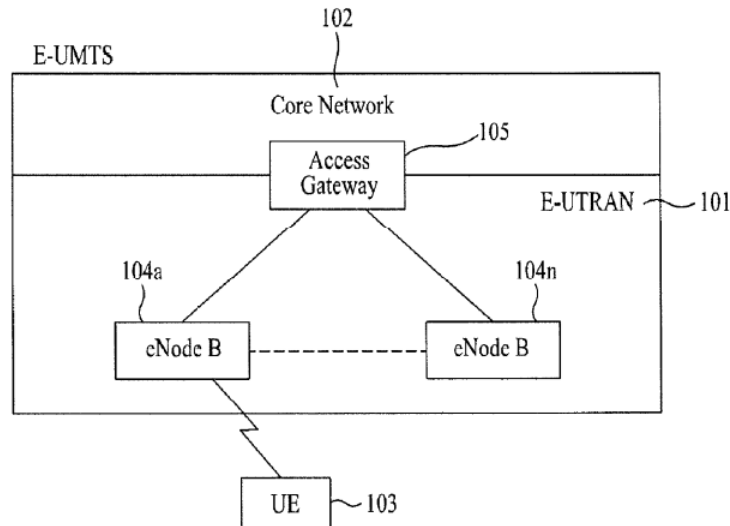


Figure 1 provides a schematic view of a network architecture for the E-UMTS, which may be conceived in terms of two component networks: Evolved UMTS Terrestrial Radio Access Network (“E-UTRAN”) 101 and Core Network 102. *Id.* at col. 1, ll. 26–35. The first of these, E-UTRAN 101, may include user equipment (“UE”) 103, multiple base stations 104 (referred to in the ’236 patent as “eNode B” or “eNB”), and Access Gateway (“AG”) 105. *Id.* at col. 1, ll. 35–39. Access Gateway 105 is positioned at the end of the network and connected to an external network, and can include a portion for processing user traffic and a portion for processing control traffic. *Id.* at col. 1, ll. 39–41.

As the ’236 patent describes, “a UE performs the random access procedure” in a number of instances, including “when the UE performs

initial access” to a base station and “when there is uplink data transmission in a situation where uplink time synchronization is not aligned or where a specific radio resource used for requesting radio resources is not allocated.” *Id.* at col. 3, ll. 42–57. A version of Figure 5 of the ’236 patent annotated by Petitioner (Ex. 2009, 12) is reproduced below.

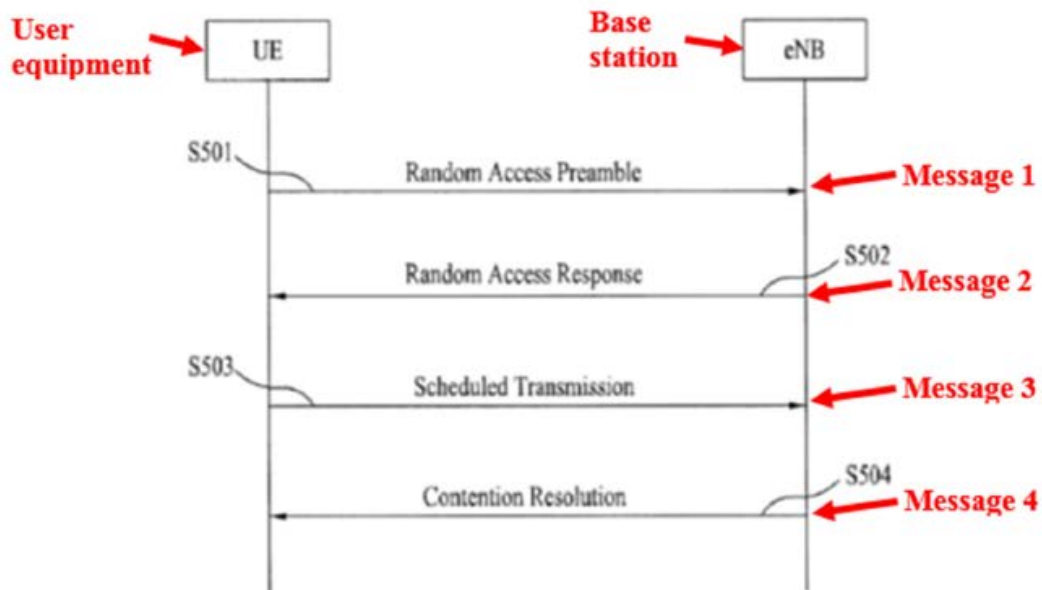


Figure 5 shows an example of a random access procedure performed between user equipment UE and base station eNB. Ex. 1001, col. 6, ll. 53–55. The procedure begins with transmission of a “random access preamble” from the UE to the base station at step S501 (referred to as a “message 1” transmitting step). *Id.* at col. 4, ll. 3–7. The UE receives a “random access response” from the base station at step S502 “in correspondence with the transmitted random access preamble” (referred to as a “message 2” receiving step). *Id.* at col. 4, ll. 7–11. Of particular relevance, the UE then transmits an uplink message to the base station at step S503 (referred to as a “message 3” or “Msg3” transmitting step). *Id.* at col. 4, ll. 11–14. The UE receives a

corresponding “contention resolution” message from the base station at step S504 (referred to as a “message 4” receiving step). *Id.* at col. 4, ll. 14–17.

In the random access procedure, the UE stores data to be transmitted via the message 3 in a “Msg 3 buffer” and transmits the stored data “in correspondence with the reception of an Uplink (UL) Grant signal.” *Id.* at col. 4, ll. 18–21. The UL Grant signal indicates information about uplink radio resources that may be used when the UE transmits a signal to the base station. *Id.* at col. 4, ll. 21–26. For example, the UL Grant could be received on the Physical Downlink Control Channel (PDCCH), indicating that new data may be transmitted, or the UL Grant could be received on the Physical Downlink Shared Channel (PDSCH), which indicates that it was received in a random access response message (i.e., message 2). *Id.* at col. 5, ll. 9–22. Thus, some UL Grants are received as part of the above message 1-2-3-4 random access procedure, and some are not. According to the ’236 patent, then-current LTE system standards provided that data stored in the Msg3 buffer of the UE would be transmitted to the base station “*regardless of the reception mode of the UL Grant signal,*” and that “*if the data stored in the Msg3 buffer is transmitted in correspondence with the reception of all UL Grant signals, problems may occur.*” *Id.* at col. 4, ll. 26–32 (emphases added). Thus, the alleged problem is that the UE could send Msg3 buffer data when it was not supposed to, outside of the proper message 1-2-3-4 random access procedure. The ’236 patent purports to solve such problems. *Id.* at col. 4, ll. 33–34.

Figure 9 of the ’236 patent is reproduced below.

FIG. 9

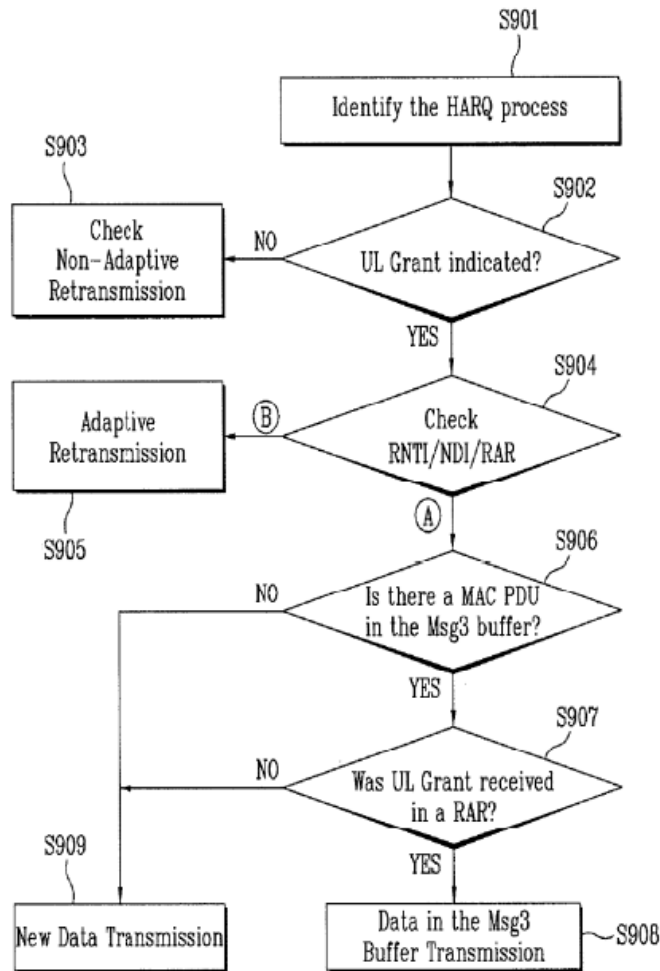


Figure 9 is a flowchart of a method showing the operation of an uplink Hybrid Automatic Repeat Request (“HARQ”) entity in a UE. *Id.* at col. 13, ll. 35–39. After a UL grant signal is received from the base station at step 902, the UE determines at step 906 whether there are data in the Msg3 buffer. *Id.* at col. 13, ll. 42–44. If so, a further determination is made at step 907 whether the received UL grant signal is on a random access response (“RAR”) message, i.e., that the UL grant was on a message 2 in the above

random access procedure. *Id.* at col. 13, l. 66–col. 14, l. 3. The UE transmits the data in the Msg3 buffer to the base station “only when” both conditions are met, i.e., “only when there is data [stored] in the Msg3 buffer when receiving the UL Grant signal and the UL Grant signal is received on the random access response message (S908).” *Id.* at col. 14, ll. 3–7.

Conversely, if either condition is not met, i.e. there are no data in the Msg3 buffer or the UL Grant signal is not on a random access response message, then the UE determines that the base station is making a request for transmission of new data and performs new data transmission at step 909.

Id. at col. 14, ll. 7–13.

B. Illustrative Claims

Claims 1 and 7 of the '236 patent, reproduced below, are independent claims respectively directed at the above-described method and at user equipment that implements the above-described method.

1. A method of transmitting data by a user equipment through an uplink, the method comprising:
 - receiving an uplink grant (UL Grant) signal from a base station on a specific message;
 - determining whether there is data stored in a message 3 (Msg3) buffer when receiving the UL Grant signal on the specific message;
 - determining whether the specific message is a random access response message;
 - transmitting the data stored in the Msg3 buffer to the base station using the UL Grant signal received on the specific message, if there is data stored in the Msg3 buffer when receiving the UL Grant signal on the specific message and the specific message is the random access response message; and
 - transmitting new data to the base station in correspondence with the UL Grant signal received on the specific message, if there is no data stored in the Msg3 buffer when receiving the UL Grant signal on the specific message or the specific message is not the random access response message.

7. A user equipment, comprising:
- a reception module adapted to receive an uplink grant (UL Grant) signal from a base station on a specific message;
 - a transmission module adapted to transmit data to the base station using the UL Grant signal received on the specific message;
 - a message 3 (Msg3) buffer adapted to store UL data to be transmitted in a random access procedure;
 - a Hybrid Automatic Repeat Request (HARQ) entity adapted to determine whether there is data stored in the Msg3 buffer when the reception module receives the UL Grant signal and the specific message is a random access response message, acquiring the data stored in the Msg3 buffer if there is data stored in the Msg3 buffer when the reception module receives the UL Grant signal and the specific message is the random access response message, and controlling the transmission module to transmit the data stored in the Msg3 buffer to the base station using the UL Grant signal received by the reception module on the specific message; and
 - a multiplexing and assembly entity used for transmission of new data,
- wherein the HARQ entity acquires the new data to be transmitted from the multiplexing and assembly entity if there is no data stored in the Msg3 buffer when the reception module receives the UL Grant signal on the specific message or the received message is not the random access response message, and controls the transmission module to transmit the new data acquired from the multiplexing and assembly entity using the UL Grant signal received by the reception module on the specific message.

C. Instituted Grounds of Unpatentability

We instituted trial for challenges under 35 U.S.C. § 103(a)² over the following combinations of references. Dec. 19.

² Because the '236 patent has a filing date before September 16, 2012 (the effective date of the Leahy-Smith America Invents Act (AIA), Pub. L. No. 112-29, § 4(c), 125 Stat. 284 (2011)), we refer herein to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

References	Challenged Claims
3GPP TS 300 ³ and 3GPP TS 321 ⁴	1–6
3GPP TS 300, 3GPP TS 321, and Ericsson ⁵	7–10, 12, 13

Petitioner asserts that 3GPP TS 300 and 3GPP TS 321 are printed publications published prior to the filing date of the provisional patent application from which the '236 patent claims priority and are thus prior art under 35 U.S.C. § 102(a). Pet. 10–15. Petitioner asserts that Ericsson is prior art under 35 U.S.C. § 102(e) because the application on which it was based was filed prior to the filing date of the provisional patent application from which the '236 patent claims priority. *Id.* at 11. Patent Owner does not challenge any of these assertions of Petitioner or otherwise challenge the prior art status of the cited references. *See generally* PO Resp. Based on this record, Petitioner has established the cited references are prior art under 35 U.S.C. §§ 102 and 103.

D. Real Parties in Interest and Related Proceedings

Petitioner identifies ZTE (USA) Inc., HTC Corporation, and HTC America, Inc. as the real parties in interest. Pet. 2.⁶ Patent Owner identifies only itself as a real party in interest. Paper 7, 2.

The parties indicate that the '236 patent is the subject of several district-court litigations: *Evolved Wireless, LLC v. Apple, Inc.*, No. 1:15-cv-542 (D. Del.); *Evolved Wireless, LLC v. HTC Corp.*, No. 1:15-cv-543

³ 3GPP TS 36.300 v8.4.0 (2008) (Ex. 1002, “3GPP TS 300”).

⁴ 3GPP TS 36.321 v8.2.0 (2008) (Ex. 1003, “3GPP TS 321”).

⁵ U.S. Patent No. 9,204,468 B2, filed June 9, 2008, issued Dec. 1, 2015 (Ex. 1004, “Ericsson”).

⁶ Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc., were identified as the real parties in interest in IPR2016-01345 (Paper 1, 3).

(D. Del.); *Evolved Wireless, LLC v. Lenovo Group Ltd.*, 1:15-cv-544 (D. Del.); *Evolved Wireless, LLC v. Samsung Electronics Co. Ltd.*, 1:15-cv-545 (D. Del.); *Evolved Wireless, LLC v. ZTE Corp.*, 1:15-cv-546 (D. Del.); *Evolved Wireless LLC v. Microsoft Corp.*, 1:15-cv-547 (D. Del.). Pet. 2–3; Paper 7, 2–3. In addition, the ’236 patent is the subject of the following *inter partes* reviews: IPR2016-01228 and IPR2016-01229.

II. ANALYSIS

A. Claim Construction

The Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. See 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). “[T]he claim construction inquiry . . . begins and ends in all cases with the actual words of the claim.” *Renishaw PLC v. Marposs Società per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). Under the broadest reasonable construction standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

A claim-construction disagreement between the parties is grounded in use of the word “if” in the two “transmitting” limitations of independent claims 1 and 7. See Pet. 16–19; PO Resp. 9–32; Reply 3–9. Those limitations implicate two conditions, resulting in different data being transmitted depending on whether both conditions are satisfied or not. The

first condition is whether “there is data stored in the Msg3 buffer when receiving the UL Grant signal on the specific message,” and the second condition is whether “the specific message is the random access response message.” Ex. 1001, col. 16, l. 59 – col. 17, l. 3; col. 17, l. 38 – col. 18, l. 7. “If” both conditions are satisfied, the “data stored in the Msg3 buffer” are transmitted to the base station; and “if” either condition is not satisfied, “new data” are transmitted to the base station. *Id.*

Petitioner presents an argument that addresses the first “transmitting” limitation in isolation, contending that the limitation “requires no construction and should be given its plain and ordinary meaning consistent with the broadest reasonable interpretation standard.” Pet. 16. According to Petitioner, “[t]he first ‘transmitting’ feature is straight-forward,” because it requires transmitting the data stored in the Msg3 buffer when the two conditions are met and nothing more. *Id.* That is, Petitioner contends that “if” in the first “transmitting” limitation should be construed as introducing a “sufficient condition.” *Id.* at 16–17.

Patent Owner presents a counterargument that considers an interplay between the two “transmitting” limitations, correctly observing that the two conditions “are independent of one another” and that the recitations in the two “transmitting” limitations are “logical opposite[s].” PO Resp. 9–12. As Patent Owner asserts, “both limitations cannot, at the same time, be true.” *Id.* at 12. In considering this logical interplay, Patent Owner contends that “if” in each “transmitting” limitation should therefore be construed as introducing a *necessary* condition: “The proper claim construction is one that follows the claim’s plain language; that is Msg3 data is transmitted if

[both conditions are] met . . . and new data are transmitted if [either condition] is not met.” *Id.* at 13.⁷

We have considered the positions of both parties, and conclude that Patent Owner presents the more compelling reading of the claim. In isolation, the plain and ordinary meaning of “if” is amenable to both *sufficient-condition* and *necessary-condition* constructions. Indeed, it is trivial to construct English sentences in which a listener would naturally understand one of those constructions to be implicated. For instance, “If there is smoke, there is fire” is naturally understood not to preclude the possibility of fire if there is no smoke (sufficient if). Conversely, “If you take another step, I’ll shoot,” is naturally understood to mean that the speaker will not shoot if the listener does not take another step (necessary if).

To resolve the ambiguity, we look, as we must, to the context provided by the claims themselves, as well as to the Specification in whose light they must be considered under the broadest-reasonable-interpretation standard. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (“the context of the surrounding words of the claim also must be considered in determining the ordinary and customary meaning of

⁷ Patent Owner characterizes its position as equivalent to reciting “but not transmitting the new data” as part of the first “transmitting” limitation, i.e., when both conditions are met; and to reciting “but not transmitting any data stored in the Msg3 buffer” as part of the second “transmitting” limitation, i.e., when at least one of the conditions is not met. PO Resp. 10. Although such additional language is logically consistent with Patent Owner’s position, we find it unnecessary to incorporate such negative limitations into the claims; the proper construction can be resolved by correctly construing the meaning of “if.”

those terms”). We agree with Patent Owner’s characterization of Petitioner’s position as improperly including the optional possibility of transmitting data stored in the Msg3 buffer even when both conditions are not satisfied. See PO Resp. 12–13. Such an optional possibility is a logical consequence of a sufficient-if construction, and we acknowledge that such a reading would be tenable if the claim included only the first “transmitting” step.⁸ But the claim explicitly answers the question of what occurs when at least one of the conditions is not satisfied: “new data” are transmitted to the base station. Ex. 1001, col. 16, l. 16 – col. 17, l. 3; col. 17, l. 52 – col. 18, l. 7. By isolating the first “transmitting” limitation, Petitioner improperly reaches too broad a construction of the claim as a whole.

Furthermore, Patent Owner’s proposed construction is consistent with the Specification of the ’236 patent. For example, in the Background of the Invention, the Specification observes that, in the prior art, “if the UL Grant signal is received in a state in which data is stored in the Msg3 buffer, the data stored in the Msg3 buffer is transmitted *regardless of* the reception mode of the UL Grant.” *Id.* at col. 4, ll. 26–30 (emphasis added). As explained in the Specification, applicants purport to resolve such a deficiency because “if the data stored in the Msg3 buffer is transmitting in correspondence with the reception of *all* UL Grant signals, problems may occur.” *Id.* col. 4, ll. 30–34 (emphasis added). In addition, the description of Figure 9 of the patent, reproduced above, explicitly explains that data in the Msg3 buffer are transmitted to the base station “only when” both conditions recited in the claims are met. *Id.* at col. 14, ll. 3–8.

⁸ Indeed, this is precisely the case for a child of the ’236 patent, as discussed *infra*.

The parties also address the relevance of the prosecution history of a child of the '336 patent. PO Resp. 22–25; Reply 8. During prosecution of U.S. Patent No. 9,532,336 B2 (Ex. 2007, “the '336 patent”), which shares the same written description as the '336 patent, explicit language was included in the independent method claims to require transmission of data stored in the Msg3 buffer “only when” such data are stored in the Msg3 buffer and the UL Grant was received on the random access response message. Ex. 2008, 146. Such “only when” language did not appear in the claims as originally filed, and was added in response to a rejection in which the Examiner made the following remarks:⁹

Claim 1 recites the limitation “if there is data stored in the Msg3 buffer and if the UL Grant signal was received on the random access response.” The limitation is directed to the action to transmit the UL Grant, however, *there is no language to limit the claim to only this scenario* or the claim language *does not provide an alternative for what if the statement is not true*. The Applicant’s invention is not being claimed in independent claims 1 and 9.

Id. at 139 (emphases added).

Importantly, the claims in the '336 patent do not include language that corresponds to the second “transmitting” limitation of the claims at issue in this proceeding—the “only when” language was added to a limitation that corresponds to the first “transmitting” limitation. We agree with Patent Owner’s characterization of the relevance of these facts and of the Examiner’s prior basis for rejection of unamended claims of the '336 patent. That is “the Examiner specifically rejected a claim without the ‘only when’

⁹ Independent method claim 26 of the '336 patent was added by amendment at the same time, including the “only when” language. Ex. 2008, 151.

language *because there was no alternative recited in the claim . . . if the condition[s were] not met.*” PO Resp. 24. The addition of the “only when” language in the ’336 patent resolves the ambiguity, recognized by the Examiner, that is otherwise resolved in the claims at issue in this proceeding by the presence of the second “transmitting” limitation. In light of this difference in the claims in the two patents, we are not persuaded by Petitioner’s argument that “Patent Owner’s decision to narrow the language from ‘if’ in the ’236 patent to ‘only when’ in the child patent demonstrates the difference in meaning between these two phrases and belies Patent Owner’s argument that they mean the same thing.” Reply 8.

For these reasons, we agree with Patent Owner that “if” in the “transmitting” limitations of independent claims 1 and 7 is properly construed, under the broadest-reasonable-interpretation standard, as introducing *necessary* conditions, rather than sufficient conditions.¹⁰ We adopt such a construction for purposes of this Decision.

B. Legal Principles Governing Obviousness

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are “such that the

¹⁰ This construction is consistent with the reasoning of *Ex Parte Schulhauser*, Appeal No. 2011-002626, slip op. (PTAB Sept. 19, 2012) (precedential). Similar to the claims at issue in this proceeding, *Schulhauser* considered a claim that recited “mutually exclusive” steps. *Schulhauser*, slip op. at 6. The Board held that, under the broadest reasonable interpretation, the claim “covers at least two methods, one in which the prerequisite condition for the [first] step is met and one in which the prerequisite condition for the [second] step is met.” *Id.* at 8. The Board did not thereby hold that the language of one of the steps could simply be read out of the claim (as Petitioner’s argument would effectively require) nor that that language could not properly inform construction of the other of the steps.

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.” We resolve the question of obviousness on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.¹¹ *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Skill in the Art

Petitioner contends:

The person of ordinary skill in the art of the subject matter of the 236 patent would have had a master’s degree in electrical engineering with 2-3 years of experience in cellular communication system, and would have been aware of the efforts of the Third Generation Partnership Project and its various groups. (Ex. 1016, Min decl., at ¶ 34.) Alternatively, that person would have had a Ph. D. in electrical engineering with the same familiarity with the work of the Third Generation Partnership Project and its various groups. (*Id.*)

Pet. 6. Patent Owner does not present any argument or contentions relating to the level of skill in the art. *See generally* PO Resp. We find Petitioner’s proposal reasonable, and accordingly, based on this record, we adopt the level of skill in the art proposed by Petitioner.

D. Obviousness of Claims 1–6 Over 3GPP TS 300 and 3GPP TS 321

Independent claim 1 and dependent claims 2–6 are challenged as obvious over 3GPP TS 300 (Ex. 1002) and 3GPP TS 321 (Ex. 1003) (Pet.

¹¹ The record does not include allegations or evidence of objective indicia of nonobviousness.

20–48), and the Board instituted an *inter partes* review on this challenge (Dec. 19).

1. *3GPP TS 300 (Ex. 1002)*

Technical Specification 300 is published by the 3GPP¹² and “provides an overview and overall description of the E-UTRAN (Evolved Universal Terrestrial Radio Access Network) radio interface protocol architecture” in an LTE system. Ex. 1002, 11. Section 10.1.5 describes a Random Access Procedure, and section 10.1.5.1 outlines a contention-based random access procedure. *Id.* at 48–49.

2. *3GPP TS 321(Ex. 1003)*

Technical Specification 321 is published by the 3GPP and “specifies the E-UTRA [Evolved Universal Terrestrial Radio Access] MAC [Medium Access Control] Protocol” in an LTE system. Ex. 1003, 6. Section 5.4 of 3GPP TS 321 describes uplink data transfer, section 5.4.1 describes UL Grant reception, and section 5.4.2.1 states:

At the given TTI [transmission time interval], the HARQ entity shall:

- if an uplink grant indicating that the NDI has been incremented compared to the value in the previous transmission of this HARQ process is indicated for this TTI or if this is the very first transmission for this HARQ process (i.e. a new transmission takes place for this HARQ process):

- if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer:

¹² The Third Generation Partnership Project is a standards-setting organization for mobile communications and was developing a cellular communication system known as the Long Term Evolution (LTE). Pet. 6; PO Resp. 2. *See also* Ex. 1001, col. 1, ll. 22–25.

- obtain the MAC PDU to transmit from the [Message3] buffer.
- else, if the “uplink prioritisation” entity indicates the need for a new transmission:
 - obtain the MAC PDU to transmit from the “Multiplexing and assembly” entity;
 - instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified parameters.

Id. at 18 (brackets in original).

3. *Obviousness Analysis*

Petitioner asserts that claims 1–6 would have been obvious over the combination of 3GPP TS 300 and 3GPP TS 321. Pet. 20–48. Petitioner advances several reasons why persons of ordinary skill in the art would have been motivated to combine the teachings of 3GPP TS 300 and 3GPP TS 321. *Id.* at 46–48 (citing Ex. 1016 (Min Decl. ¶¶ 116–119)). Petitioner asserts skilled artisans “would have consulted the two complementary references together because both specifications were part of the then-current LTE standard” and such artisans “considered the LTE standard as one collective reference set.” *Id.* at 46. The ’236 patent repeatedly refers to the “LTE system standard” as a whole. Ex. 1001, col. 4, l. 26, col. 12, l. 17, col. 12, l. 49, col. 13, l. 6. Petitioner also asserts “[s]killed artisans also would have consulted the 300 and 321 references together because both specifications described LTE’s random access procedure” and “[t]o understand and implement the random access procedure, the skilled artisan would have needed to consult both specifications together, rather than

treating each specification in isolation.” Pet. 46. And, 3GPP TS 300 references “3GPP TS 321.” Ex. 1002, 11. Patent Owner does not contest Petitioner’s assertions related to the reason for combining the teachings of the cited references. *See generally* PO Resp. Based on this record, we conclude Petitioner has established that a person of ordinary skilled in the art would have had a reason to combine the teachings of 3GPP TS 300 and 3GPP TS 321.

a. Independent Claim 1

Claim 1 is a method claim. The preamble of claim 1 recites, “[a] method of transmitting data by a user equipment through an uplink.” Petitioner cites section 5.4 of 3GPP TS 321, which is titled “UL-SCH data transfer” (Ex. 1003, 18), and section 10.1.5.1 of 3GPP TS 300, which describes a “contention based random access procedure” in which step 3 is the “[f]irst scheduled UL transmission on UL-SCH” by the “UE” (Ex. 1002, 48–49). Pet. 22–23. “SCH” is an abbreviation for synchronization channel. Ex. 1002, 14. We find the cited art teaches, “[a] method of transmitting data by a user equipment through an uplink.”

The first method step of claim 1 recites, “receiving an uplink grant (UL Grant) signal from a base station on a specific message.” Petitioner cites both 3GPP TS 321 and 3GPP TS 300 as teaching this step. Pet. 23–24. 3GPP TS 321 states, “the UE shall for each TTI [Transmission Time Interval]: - if [(1)] an uplink grant for the TTI has been received on the PDCCH [Physical Downlink Control Channel] for the UE’s C-RNTI [Cell-Radio Network Temporary Identifier] or Temporary C-RNTI; or – [(2)] if an uplink grant for this TTI has been received in a Random Access Response; - [then] indicate a valid uplink grant.” Ex. 1003, 18. Petitioner cites Figure

10.1.5.1 of 3GPP TS 300 as showing eNodeB, a base station, would transmit the random access response to the UE in step 2. Ex. 1002, 48. We find the cited art teaches, “receiving an uplink grant (UL Grant) signal from a base station on a specific message.”

The second method step of claim 1 recites, “determining whether there is data stored in a message 3 (Msg3) buffer when receiving the UL Grant signal on the specific message.” Petitioner cites 3GPP TS 321 as teaching this step. Pet. 24–25. Section 5.4.2.1 of 3GPP TS 321 states, “[a]t the given TTI [Transmission Time Interval], the HARQ [Hybrid Automatic Repeat Request] entity shall: . . . if there is an ongoing Random Access procedure and there is a MAC PDU [Medium Access Control Packet Data Unit] in the [Message3]^[13] buffer.” Ex. 1003, 18. With regard to when the determination of whether there is data stored in the Msg3 buffer occurs, 3GPP TS 321 teaches making this determination during the same TTI (Time Transmission Interval). *Id.* Thus, Section 5.4.2.1 describes determining whether there is data in the Msg3 buffer (“if . . . there is a . . . [Data Unit] in the [Message3] buffer”) when the UL Grant signal is received on the specific message (“if there is an ongoing Random Access procedure”). *Id.*

Patent Owner argues that Petitioner’s declarant, Dr. Min, testified that 3GPP TS 321 does not teach making this determination in the same TTI. PO Resp. 34. But this is incorrect. We credit the testimony of Dr. Min, who repeatedly testified that 3GPP TS 321 teaches making this determination in the same TTI. *See, e.g.*, Ex. 2004, 96:20–21 (“What the 321 reference says is to determine for that TTI, and that’s what the claim language is.”). We

¹³ This bracketed material in original.

find 3GPP TS 321 teaches, “determining whether there is data stored in a message 3 (Msg3) buffer when receiving the UL Grant signal on the specific message.”

The third method step of claim 1 recites, “determining whether the specific message is a random access response message.” Petitioner cites 3GPP TS 321 for this element. Pet. 25–26. Section 5.4.1 of 3GPP TS 321 states, “if an uplink grant for this TTI has been received in a Random Access Response.” Ex. 1003, 18. We find 3GPP TS 321 teaches, “determining whether the specific message is a random access response message.”

The fourth method step of claim 1 recites:

transmitting the data stored in the Msg3 buffer to the base station using the UL Grant signal received on the specific message, if there is data stored in the Msg3 buffer when receiving the UL Grant signal on the specific message and the specific message is the random access response message.

Petitioner cites 3GPP TS 300 and 3GPP TS 321 as teaching this element. Pet. 29–31; Reply 10–13. Petitioner argues that condition (1), “if there is data stored in the Msg3 buffer when receiving the UL Grant signal on the specific message” was shown to be taught in relation to the second step of claim 1, and condition (2), “if . . . the specific message is the random access response message” was shown to be taught in relation to the third step of claim 1. And, section 5.4.2.1 of 3GPP TS 321 states, “if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer”: - obtain the MAC PDU to transmit from the [Message3] buffer.” Ex. 1003, 18 (brackets in original).

The fifth and final method step of claim 1 recites:

transmitting new data to the base station in correspondence with the UL Grant signal received on the specific message, if there is no data stored in the Msg3 buffer when receiving the UL Grant signal on the specific message or the specific message is not the random access response message.

Petitioner cites 3GPP TS 321 as teaching this element. Pet. 37–40. Section 5.4.2.1 of 3GPP TS 321 states:

- if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer:
 - obtain the MAC PDU to transmit from the [Message3] buffer.
- **else**, if the “uplink prioritisation” entity indicates the need for a new transmission:
 - obtain the MAC PDU to transmit from the “Multiplexing and assembly” entity;
 - instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified parameters.

Ex. 1003, 18 (emphasis added) (brackets in original). This element provides that “new data” should be transmitted if either conditions (1) or (2) are not met. The cited passage in 3GPP TS 321 teaches triggering a “new transmission” if there is not a MAC PDU (i.e., no data) in the Msg3 buffer. With regard to this element, Patent Owner acknowledges, “the 321 reference (Exhibit 1003)—which purportedly invalidates the claims of the ’236 patent, teaches transmitting new data for a = true [condition (1) met] and b = false

[condition (2) not met].” PO Resp. 18–19 (citing Pet. at 39 (Scenario 3)).¹⁴ Thus, Patent Owner acknowledges that 3GPP TS 321 teaches transmitting new data if one of conditions (1) or (2) fails.

Although Petitioner advocates for a construction in which “if” introduces sufficient conditions, Petitioner alternatively presents arguments that account for the construction we adopt, namely that “if” introduces necessary conditions. In these alternative arguments, Petitioner asserts that both 3GPP TS 321 and 3GPP TS 300 would be interpreted by one of ordinary skill in the art to teach or suggest transmission of the data in the Msg3 buffer only if both conditions (1) and (2) are met and transmission of new data if either condition (1) or (2) is not met. Pet. 29–31; *see also* Reply 10–13. Petitioner’s showing in this regard is supported by the Declaration of Paul S. Min, Ph. D. (Ex. 1016). Patent Owner proffers a Declaration by Todor Cooklev, Ph. D. (Ex. 2006), which it contends supports its position. *See, e.g.*, PO Resp. 42, 46.

Petitioner argues that the Cooklev Declaration should be given no weight because the declarant did not acknowledge “that (i) willful false statements are punishable by fine, imprisonment, or both; or (ii) the statements are true under penalty of perjury.” Reply 6–7 (citations omitted).¹⁵ In an IPR proceeding, evidence includes affidavits. 37 C.F.R.

¹⁴ In Petitioner’s Scenario 3, there is data in the Msg3 buffer (condition (1) is met) but the random access procedure is not ongoing (condition (2) is not met). Pet. 39–40. At pages 38–42 of the Response, Patent Owner argues that Petitioner’s evidence fails with regard to the second transmitting step of claim 1, but Patent Owner only addresses Petitioner’s Scenario 1 (condition (1) is not met and condition (2) is met (Pet. 38–39)) and Scenario 2 (neither condition (1) nor (2) is met (Pet. 39)).

¹⁵ Petitioner also argues the Cooklev Declaration should be given no weight

§ 42.63(a) (“[e]vidence consists of affidavits”). 37 C.F.R. § 42.2 defines affidavit as “affidavit or declaration under § 1.68 of this chapter. A transcript of an *ex parte* deposition or a declaration under 28 U.S.C. 1746 may be used as an affidavit.” 37 C.F.R. § 1.68 requires that the declarant be warned, on the same document, that “willful false statements and the like are punishable by fine or imprisonment, or both.” 28 U.S.C. § 1746 provides that unsworn declarations under penalty of perjury may be used where a matter is required or permitted to be supported by sworn declaration or affidavit. To give weight to Dr. Cooklev’s statements would thwart the purpose of these rules. *See Intel Corp. v. Alacritech, Inc.*, IPR 2017-01402, Paper 8, 6 (PTAB Nov. 6, 2017) (citation omitted).

Patent Owner had notice of the defect in the Cooklev Declaration at least as early as the filing of Petitioner’s Reply on June 14, 2017. Reply 1, 6–7, 11, 25.¹⁶ In addition, the defect in the Cooklev Declaration was discussed at the oral hearing on August 8, 2017. Tr. 22:9–23:5, 45:1–46:3. At the oral hearing, Patent Owner acknowledged that the Cooklev Declaration was defective. Tr. 45:1–46:3. Nevertheless, Patent Owner took no affirmative steps to cure the defect. Although we recognize that Petitioner may well have capitalized tactically on the defect by forgoing cross-examination in which Dr. Cooklev may have provided sworn testimony consistent with his Declaration, we cannot simply ignore the

because Dr. Cooklev applies the clear and convincing evidence standard to the invalidity evidence (Ex. 2006 ¶ 16) rather than the preponderance of evidence standard applicable in this proceeding (35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d)). Reply 1, 25.

¹⁶ We also note that Petitioner noticed the deposition of Dr. Cooklev (Paper 26) but withdrew the notice (Paper 27).

regulatory and statutory requirements that render that Declaration defective. To give weight to the Declaration would require us to surmise that Dr. Cooklev would swear to the statements in his Declaration, and we are in no position to do so. Accordingly, we do not consider Ex. 2006 and give no weight to Patent Owner's reliance on the Cooklev Declaration.

3GPP TS 321 states, “[i]f the UE receives a[n uplink] 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, 18. The RA-RNTI refers to the Random Access Radio Network Temporary Identifier and is used “when Random Access Response messages are transmitted.” *Id.* at 7. *See also* Ex. 1003 at 10 (“RA-RNTI for Random Access Response on DL-SCH”). Section 5.1.4 of 3GPP TS 321 states, “[o]nce the Random Access Preamble is transmitted [Message 1], the UE shall . . . monitor for Random Access Response(s) identified by the RA-RNTI . . . if the Random Access Response [Message 2] contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble (see subclause 5.1.3), the UE shall: . . . process the received UL grant value.” *Id.* at 13. Taking these passages into consideration with the process in Section 5.4.2.1 discussed above (*see* Ex. 1003, 18 (“if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer”: - obtain the MAC-PDU to transmit from the [Message3] buffer, else . . . trigger a new transmission” (brackets in original))), 3GPP TS 321 teaches to transmit the data in the Msg3 buffer only in response to an uplink grant in the random access message and there is data in the Msg3 buffer (conditions (1) and (2) are met) and to transmit new data only if conditions 1 or 2 are not met.

3GPP TS 300 in Figure 10.1.5.1-1, reproduced below, shows a random access procedure. Ex. 1002, 48.

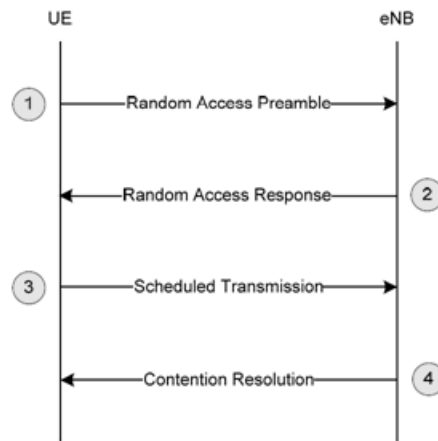


Figure 10.1.5.1-1: Contention based Random Access Procedure

Figure 10.1.5.1-1 depicts a random access method in which the UE transmits a Random Access Preamble in message 1 and eNB, a base station, transmits a Random Access Response in message 2. The “Random Access Response generated by MAC on DL-SCH . . . Addressed to RA-RNTI . . . Conveys at least . . . [an] initial UL grant.” Ex. 1002, 49. In response, the UE transmits Scheduled Transmission, message 3, described as “First Scheduled UL transmission on UL-SCH” which “depends on the UL grant conveyed in step 2.” *Id.*

With regard to these passages in 3GPP TS 300 and 3GPP TS 321, Petitioner argues:

Reading these complementary standards documents together, as skilled artisans would do, they would understand that the 300 and 321 references taught two facts. First, message 3 transmission should occur only if “there is an ongoing random access procedure and there is a MAC PDU in the [Message3] buffer.” (*Id.*[Min Decl.] at ¶ 76 (citing Ex. 1003, 321 reference, at § 5.4.2.1 (brackets in original)).) Second, message 3 transmission requires a prior random access response grant. (*Id.* (citing Ex. 1002, 300 reference, at § 10.1.5.1).) These two facts

established that a UE should transmit message 3 **only if** it receives a random access response grant while data is in the message 3 buffer. (*Id.*) Therefore, the 300 and 321 references collectively taught the “only if” feature. (*Id.*)

Pet. 32.

Petitioner’s arguments are persuasive. With respect to the first transmitting step, 3GPP TS 321 describes transmitting the contents of the Msg3 buffer when both conditions are met: “if there is an ongoing Random Access procedure [(condition 2)] and there is a MAC PDU in the [Message3] buffer [(condition 1)].” Ex. 1003, 18. The language “if there is an ongoing Random Access procedure” in section 5.4.2.1 requires verifying whether the current process *is* a random access procedure, which means that it must know that the uplink grant was the “specific message,” i.e., a proper message 2, or otherwise the current process would not be a random access procedure.¹⁷ As shown in sections 3.1 and 5.1.4, a Random Access Response may be identified by the RA-RNTI. *Id.* at 7, 13. Thus, when discussing the “ongoing Random Access procedure,” the reference is implicating the uplink grant “received in a Random Access Response.” *Id.* at 18. If the reference intended the “ongoing Random Access procedure” to include both the uplink grants received in section 5.4.1, as Patent Owner appears to contend, then it would have merely referenced the more generic “valid uplink grant.” With regard to 3GPP TS 300, based on the passages cited above, Petitioner’s declarant, Dr. Min, states, “the eNodeB sends the

¹⁷ That is, the UL grant was something else, such as “an uplink grant . . . received on the PDCCH for the UE’s C-RNTI or Temporary C-RNTI,” as expressed in Section 5.4.1 as the alternative to a Random Access Response. Ex. 1003, 18.

UE a random access response grant, and the UE responds with a message 3 transmission that depends on the random access response grant. This taught that the message 3 transmission requires a prior random access response grant.” Ex. 1016 ¶ 75. Accordingly, upon consideration of the cited passages in 3GPP TS 300 and 3GPP TS 321, the Min Declaration, and Petitioner’s arguments, we find 3GPP TS 300 and 3GPP TS 321 teach the first “transmitting” limitation recited in claim 1 under the construction we have adopted.

Similarly, with respect to the second transmitting step, section 5.4.2.1 of 3GPP TS 321 indicates that after determining “if there is an ongoing Random Access Message and there is a MAC PDU in the [Message3] buffer” “obtain the MAC PDU to transmit from the Message3] buffer” or “else” make a “new transmission.”¹⁸ Ex. 1003, 18 (brackets in original). Accordingly, 3GPP TS 321 teaches the second “transmitting” limitation under the construction we adopted.

Petitioner also argues that evidence of simultaneous development by others shows that a person of ordinary skill in the art would have interpreted the 3GPP TS 300 and 3GPP TS 321 as teaching transmission of the data in

¹⁸ Patent Owner attempts to distinguish the procedure of section 5.4.2.1 of 3GPP TS 321 under Petitioner’s Scenarios 1 and 2 (*see* fn. 14 above) on the basis that this passage refers to an “‘uplink prioritisation’ entity.” *See* PO Resp. 38. Dr. Min testified that the “‘uplink prioritisation’ entity” refers to the “Scheduling/Priority Handling” entity shown in Figures 6-1 and 6-2 of 3GPP TS 300 (Ex. 1002, 28). Ex. 2004, 117, l. 18 – 127, l. 2. Dr. Min also testified the function of the “‘uplink prioritisation’ entity” is to receive the new data and transmit it to the “‘Multiplexing and assembly’ entity” and the “HARQ entity” referred to in section 5.4.2.1 of 3GPP TS 321 and shown in Figures 6-1 and 6-2 of 3GPP TS 300. *Id.* at 123, l. 16 – 124, l. 3.

the Msg3 buffer only if conditions (1) and (2) are met. Pet. 35–37.

Petitioner contends Ex. 1005 titled, “3GPP TSG-RAN WG2#61bis” which was submitted to the 3GPP by Philips and NXP Semiconductors for a meeting held on March 31 through April 4, 2008, in Shenzhen, China, teaches the fourth step of claim 1, the first “transmitting” limitation. *Id.* at 34–35. Figure 2 and the related description in the Philips submission to 3GPPG shows transmission of the data in the Msg3 buffer if conditions (1) and (2) are met. Ex. 1005, 1–2. Petitioner makes a similar contention with Ex. 1008 titled, “3GPP TSG-RAN WG2 #63” which was submitted to the 3GPP by Qualcomm Europe for a meeting held on August 18 through 22, 2008, in Jeju Island, Korea. Pet. 37. In this document, Qualcomm proposed the “HARQ should obtain the MAC PDU to transmit from the [Message3] buffer **only** in response to UL grant in a Random Access Response.” Ex. 1008, 2 (emphasis added). Patent Owner argues that the Petitioner’s simultaneous development argument is wrong because Petitioner did not otherwise show invalidity under the proper construction of the claims. PO Resp. 47. However, as indicated above, we find 3GPP TS 321 and 3GPP TS 300 have been shown to teach the method recited in claim 1 under the proper construction. In addition, we agree with Petitioner that Ex. 1005 and Ex. 1008 are evidence of simultaneous invention by others working within 3GPP on the LTE standard and provide further support for concluding claim 1 would have been obvious. *See Geo M. Martin Co. v. Alliance Machine Sys Int’l LLC*, 618 F.3d 1294, 1306 (Fed. Cir. 2010) (“Independently made, simultaneous inventions, made ‘within a comparatively short space of time,’ are persuasive evidence that the claimed apparatus ‘was the product only of ordinary mechanical or engineering skill.’”)

We conclude that Petitioner demonstrates, by a preponderance of the evidence, that claim 1 is unpatentable under 35 U.S.C. § 103(a) over 3GPP TS 300 and 3GPP TS 321.

b. Dependent Claims 2–6

Dependent claim 2 recites, “wherein the transmitting the new data to the base station includes: acquiring a Medium Access Control Protocol Data Unit (MAC PDU) from a multiplexing and assembly entity; and transmitting the MAC PDU to the base station.” Petitioner cites 3GPP TS 321 as teaching this element. Pet. 40–41. As noted above, section 5.4.2.1 of 3GPP TS 321 states:

- if there is an ongoing Random Access procedure and there is a MAC PDU in the [Message3] buffer:
 - obtain the MAC PDU to transmit from the [Message3] buffer.
- else, if the “uplink prioritisation” entity indicates the need for a new transmission:
 - ***obtain the MAC PDU to transmit from the “Multiplexing and assembly” entity;***
 - ***instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified parameters.***

Ex. 1003, 18 (emphasis added). We find 3GPP TS 321 teaches the limitations of claim 2.

Dependent claim 3 recites, “wherein the UL Grant signal received on the specific message is a UL Grant signal received on a Physical Downlink Control Channel (PDCCH), and wherein the user equipment transmits new

data in correspondence with the UL Grant signal received on the PDCCH.” Petitioner cites 3GPP TS 321. Pet. 41–42. As shown above, section 5.4.1. of 3GPP TS 321 states, “if an uplink grant for this TTI has been received on the PDCCH” and section 5.4.2.1 states, “if the ‘uplink prioritisation’ entity indicates the need for a new transmission: - obtain the MAC PDU to transmit from the ‘Multiplexing and assembly’ entity; - instruct the HARQ process corresponding to this TTI to trigger a new transmission using the identified parameters.” Ex. 1003, 18. We find 3GPP TS 321 teaches the limitations of claim 3.

Dependent claim 4 recites, “wherein the data stored in the Msg3 buffer is a Medium access Control Protocol Data Unit (MAC PDU) including a user equipment identifier.” Petitioner cites 3GPP TS 300 and 3GPP TS 321. Pet. 42–44. As shown above, section 5.4.2.1 of 3GPP TS 321 states, “if . . . there is a MAC PDU in the [Message3] buffer.” Ex. 1003, 18 (brackets in original). Section 6.1.2 of 3GPP TS 321 teaches, “[a] MAC PDU consists of . . . zero, or more MAC control elements.” *Id.* at 24. One of the “MAC Control Elements” is the “C-RNTI MAC Control Element” that “contains the C-RNTI of the UE.” *Id.* at 26. The “C-RNTI” is the “Cell-Radio Network Temporary Identifier.” *Id.* at 7. Section 10.1.5.1 of 3GPP TS 300 teaches message 3 (Scheduled Transmission) “[c]onveys at least the C-RNTI of the UE.” Ex. 1002, 48–49. We find the cited art teaches the limitations of claim 4.

Dependent claim 5 recites, “wherein the data stored in the Msg3 buffer further includes information about a buffer status report (BSR) if the user equipment starts a random access procedure for the BSR.” Petitioner cites 3GPP TS 300 and 3GPP TS 321. Pet. 44–46. Section 5.4.5 of 3GPP

TS 321 is directed to “Buffer Status Reporting” and states, “[t]he Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data in the UL buffers of the UE.” Ex. 1003, 21. As noted above, section 5.4.2.1 of 3GPP TS 321 states, “if . . . there is a MAC-PDU in the [Message3] buffer.” *Id.* at 18 (brackets in original). Also, as shown above, section 6.1.2 of 3GPP TS 321 teaches, “[a] MAC PDU consists of . . . zero, or more MAC control elements.” *Id.* at 24. One of the “MAC Control Elements” is a “Buffer Status Report (BSR).” *Id.* at 26. Section 10.1.5.1 of 3GPP TS 300 teaches message 3 (Scheduled Transmission) “[i]ncludes an uplink Buffer Status Report when possible.” Ex. 1002, 48–49. We find the cited art teaches the limitations of claim 5.

Dependent claim 6 recites, “wherein the UL Grant signal received on the specific message is either a UL Grant signal received on a Physical Downlink Control Channel (PDCCH) or a UL Grant signal on the random access response message.” Petitioner cites 3GPP TS 321. Pet. 45–46. As noted above, section 5.4.1 of 3GPP TS 321 states, “the UE shall for each TTI [Transmission Time Interval]: - if an uplink grant for this TTI has been received on the PDCCH [Physical Downlink Control Channel] for the UE’s C-RNTI [Cell-Radio Network Temporary Identifier] or Temporary C-RNTI; or – if an uplink grant for this TTI has been received in a Random Access Response.” Ex. 1003, 18. We find 3GPP TS 321 teaches the limitations of claim 6.

Patent Owner fails to contest any part of Petitioner’s showing with regard to dependent claims 2–6. *See generally* PO Resp. We conclude that Petitioner demonstrates, by a preponderance of the evidence, that claims 2–6

are unpatentable under 35 U.S.C. § 103(a) over 3GPP TS 300 and 3GPP TS 321.

E. Obviousness of Claims 7–10, 12, and 13 Over 3GPP TS 300, 3GPP TS 321, and Ericsson

Independent claim 7 and dependent claims 8–10, 12, and 13 were challenged as obvious over 3GPP TS 300 (Ex. 1002), 3GPP TS 321 (Ex. 1003), and Ericsson (Ex. 1004) (Pet. 48–59) and the Board instituted an *inter partes* review on this challenge (Dec. 19).

1. Ericsson (Ex. 1004)

Ericsson is titled “Timing Alignment in an LTE System” and generally describes the use of a timing advance value for transmissions from user equipment to a controlling node of a cell in a cellular communications system, such as an LTE system. Ex. 1004, Abstract, col. 1, ll. 5–8, col. 7, ll. 15–18. When the Ericsson method is “applied in an LTE system, the procedure in which it is employed is preferably an LTE Random Access procedure.” *Id.* at col. 7, ll. 21–23. Figure 6 of Ericsson is reproduced below.

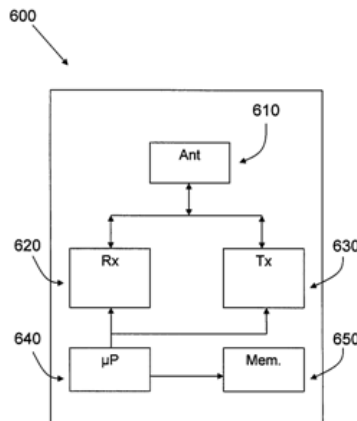


Fig 6

Figure 6 is a schematic block diagram of a transceiver for use as a user terminal or user equipment. Ex. 1004, col. 7, ll. 24–26. Transceiver 600 comprises antenna 610, transmit part 630, receive part 620, memory 650, and microprocessor 640. *Id.* at col. 7, ll. 26–30. Memory 640, transmit part 630, and antenna 610 can transmit access requests to a controlling node, and antenna 610 and receiver 620 can receive messages from a controlling node. *Id.* at col. 7, ll. 33–40.

2. Obviousness Analysis

Petitioner asserts that claims 7–10, 12, and 13 would have been obvious over the combination of 3GPP TS 300, 3GPP TS 321, and Ericsson. Pet. 48–59. With regard to combining the teachings of 3GPP TS 300, 3GPP TS 321, and Ericsson, the Petition asserts:

The skilled artisan would have combined the teachings of the 300 and 321 references with the specific hardware implementation details provided in the Ericsson patent. (Ex. 1016, Min decl., at ¶ 157.) The 300 and 321 references described a UE, an eNodeB, and their components at a high level from a functional point of view, but by their very nature, did not provide all of the specific structural details. (*Id.* at ¶ 157 (citing Ex. 1003, 321 reference, at 4.1 (“The objective is to describe the MAC architecture and the MAC entity from a functional point of view.”).) Many structural features such as a transmission module and reception module would have been routine, common-sense design choices for the skilled artisan, who would have recognized that those features are necessary to implement working LTE devices. (*Id.* at ¶ 157.) But to the extent the skilled artisan had wanted more information about a UE’s structure, the skilled artisan would have logically and predictably consulted a reference such as the Ericsson patent, which provided a block diagram of the components included in a UE, such as transmission and reception modules. (*Id.* at ¶ 157.) The skilled artisan would have also turned to the Ericsson patent because it is in the same field of endeavor as the prior art specifications

concerning LTE's random access process and was created by a well-known manufacturer of cellular devices. (*Id.* at ¶ 157.) Like the prior art specifications, the Ericsson patent specifically focused on the LTE random access procedure. (*Id.* (citing Ex. 1004, Ericsson patent, at 4:42-54, 7:16-23).)

Pet. 58–59. Patent Owner fails to contest Petitioner's presentation with regard to the motivation to combine 3GPP TS 300, 3GPP TS 321, and Ericsson. *See generally* PO Resp. Based on this record, we conclude Petitioner has established that a person of ordinary skilled in the art would have had a reason to combine the teachings of 3GPP TS 300, 3GPP TS 321, and Ericsson.

a. Independent Claim 7

Claim 7 is an apparatus claim directed to a user equipment (UE). It recites modules, a buffer, and entities which perform the same functions as recited in claim 1. Patent Owner states, “[t]he similarities between claim 1 (a method claim) and claim 7 (an apparatus claim), are notable,” “[t]he structure of claim 7 resembles the structure of claim 1” that “is written as an apparatus claim, with entities ‘adapted to’ perform steps.” PO Resp. 30–31.

The preamble of claim 7 recites “user equipment.” Section 5.4 of 3GPP TS 321 teaches a UE. Ex. 1003, 18–22. Section 10.1.5.1 of 3GPP TS 300 teaches a UE. Ex. 1002, 48–50. Ericsson teaches a UE. Ex. 1004, Figure 1. We find the cited art teaches, “user equipment.”

The first element of claim 7 recites, “a reception module adapted to receive an uplink grant (UL Grant) signal from a base station on a specific message.” Figure 6 of Ericsson, shown above, is a block diagram of a UE and the detailed description teaches, “[t]he transceiver 600 also uses the antenna 610 and ***the receiver 620 for receiving an initiation message such***

as MSG 2 in response from the controlling node along with a second timing advance value.” Ex. 1004, col. 7, ll. 24–26, 38–41 (emphasis added). The controlling node is an eNodeB, a base station. *Id.* at col. 3, l. 66. The functions of this element were shown to be taught by the cited art in the discussion above relating to the first step of claim 1. *See also* Pet. 49–50. We find the cited art teaches, “a reception module adapted to receive an uplink grant (UL Grant) signal from a base station on a specific message.”

The second element of claim 7 recites, “a transmission module adapted to transmit data to the base station using the UL Grant signal received on the specific message.” The description of Figure 6 of Ericsson teaches, “the transmit part 630 and the antenna 610 for requesting communication with the controlling node in a contention based procedure by transmitting an access request such as MSG 1.” Ex. 1004, col. 7, ll. 34–37. The functions of this element were shown to be taught by the cited art in the discussion above relating to claim 1. *See also* Pet. 50–51. We find the cited art teaches, “a transmission module adapted to transmit data to the base station using the UL Grant signal received on the specific message.”

The remaining four elements of claim 7 recite:

- a message 3 (Msg3) buffer adapted to store UL data to be transmitted in a random access procedure;

- a Hybrid Automatic Repeat Request (HARQ) entity adapted to determine whether there is data stored in the Msg3 buffer when the reception module receives the UL Grant signal and the specific message is a random access response message, acquiring the data stored in the Msg3 buffer if there is data stored in the Msg3 buffer when the reception module receives the UL Grant signal and the specific message is the random access response message, and controlling the transmission module to transmit the data stored in the Msg3 buffer to the base station

using the UL Grant signal received by the reception module on the specific message; and

a multiplexing and assembly entity used for transmission of new data,

wherein the HARQ entity acquires the new data to be transmitted from the multiplexing and assembly entity if there is no data stored in the Msg3 buffer when the reception module receives the UL Grant signal on the specific message or the received message is not the random access response message, and controls the transmission module to transmit the new data acquired from the multiplexing and assembly entity using the UL Grant signal received by the reception module on the specific message.

3GPP TS 300 and 3GPP TS 321 teach these elements as shown above with regard to claim 1. *See also* Pet. 50–53.

We conclude that Petitioner demonstrates, by a preponderance of the evidence, that claim 7 is unpatentable under 35 U.S.C. § 103(a) over 3GPP TS 300, 3GPP TS 321 and Ericsson.

b. Dependent Claims 8–10, 12, and 13

Claim 8 recites,

one or more HARQ processes; and

HARQ buffers respectively corresponding to the one or more HARQ processes,

wherein the HARQ entity transfers the data acquired from the multiplexing and assembly entity or the Msg3 buffer to a specific HARQ process of the one or more HARQ processes and controls the specific HARQ process to transmit the data acquired from the multiplexing and assembly entity or the Msg3 buffer through the transmission module.

Petitioner cites 3GPP TS 321. Pet. 53–55. Section 5.4.2.1 of 3GPP TS 321 teaches, “[a] number of parallel HARQ processes are used in the UE to support the HARQ entity.” Ex. 1003, 18. Section 5.4.2.2 of 3GPP TS 321

teaches, “[e]ach HARQ process is associated with a HARQ buffer.” *Id.* at 19. As shown above with regard to claim 1, 3GPP TS 321 teaches the functions of claim 8. *See also* Pet. 54–55. We find the cited art teaches the limitations of claim 8.

Claim 9 recites,

wherein, when the specific HARQ process transmits the data stored in the Msg3 buffer through the transmission module, the data stored in the Msg3 buffer is controlled to be copied into a specific HARQ buffer corresponding to the specific HARQ process, and the data copied into the specific HARQ buffer is controlled to be transmitted through the transmission module.

Section 5.4.2.2 of 3GPP TS 321 teaches, “the HARQ process shall . . . - store the MAC PDU in the associated HARQ buffer; - generate a transmission.” Ex. 1003, 19. As shown above with regard to claim 1, 3GPP TS 321 teaches storing the MAC PDU in the Msg3 buffer and transmitting the MAC PDU. *See also* Pet. 56–57. We find the cited art teaches the limitations of claim 9.

Claim 10 recites the same element as claim 3, claim 12 recites the same element as claim 4, and claim 13 recites the same element as claim 6. As shown above with regard to claims 3, 4, and 6, respectively, the cited art teaches the elements recited in claims 10, 12 and 13.

Patent Owner fails to contest any part of Petitioner’s showing with regard to dependent claims 8–10, 12, and 13. *See generally* PO Resp. Based on this record, we conclude that Petitioner demonstrates, by a preponderance of the evidence, that claims 8–10, 12, and 13 are unpatentable under 35 U.S.C. § 103(a) over 3GPP TS 300, 3GPP TS 321 and Ericsson.

III. CONCLUSION

For the foregoing reasons, we conclude that Petitioner demonstrates, by a preponderance of the evidence, that claims 1–6 are unpatentable under 35 U.S.C. § 103(a) over 3GPP TS 300 and 3GPP TS 321 and claims 7–10, 12, and 13 are unpatentable under 35 U.S.C. § 103(a) over 3GPP TS 300, 3GPP TS 321, and Ericsson.

IV. ORDER

It is

ORDERED that, based on a preponderance of the evidence, claims 1–10, 12, and 13 are held to be unpatentable;

FURTHER ORDERED that, because this is final written decision, parties to this proceeding seeking judicial review of our decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2016-00757
Patent 7,881,236 B2

PETITIONER:

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