

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.
Petitioner

v.

G+ COMMUNICATIONS, LLC
Patent Owner

Patent No. 10,448,430

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,448,430**

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Ex. 1007	U.S. Patent No. 10,034,308 to Lee et al. (“Lee”)
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Ex. 1011	U.S. Patent Publication No. 2016/0374068 to Kim et al. (“Kim”)
Ex. 1012	U.S. Patent Publication No. 2014/0362794 A1 to Zhao et al. (“Zhao”)

I. INTRODUCTION

Samsung Electronics Co., Ltd. (“Petitioner”) respectfully requests *inter partes* review of claims 1-15, 17, and 18 (“the challenged claims”) of U.S. Patent No. 10,448,430 (“the ’430 patent”) (Ex. 1001), which, according to PTO records, is assigned to G+ Communications, LLC (“Patent Owner”). For the reasons discussed below, the challenged claims should be found unpatentable and canceled.

II. MANDATORY NOTICES

Real Parties-in-Interest: Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies the following as the real parties-in-interest: Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.

Related Matters: The ’430 patent is asserted in the following civil action: *G+ Communications, LLC v. Samsung Electronics Co., Ltd., et al.*, Case No. 2:22-cv-0078-JRG (E.D. Tex.). Petitioner has previously filed IPR petitions challenging U.S. Patent Nos. 10,736,130 (IPR2022-01598) and 10,594,443 (IPR2023-00171), which patents are also at issue in the above-noted civil action.

Counsel and Service Information: Lead counsel is Naveen Modi (Reg. No. 46,224). Backup counsel is Joseph Palys (Reg. No. 46,508). Service information is Paul Hastings LLP, 2050 M Street NW, Washington, D.C. 20036, Tel.: 202.551.1700, Fax: 202.551.1705, email: Samsung-G+-IPR@paulhastings.com. Petitioner consents to electronic service.

III. PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15 AND 42.103

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. 50-2613.

IV. GROUNDS FOR STANDING

Petitioner certifies under 37 C.F.R. § 42.104(a) that the '430 patent is available for review and Petitioner is not barred or estopped from requesting review on the grounds identified herein.

V. PRECISE RELIEF REQUESTED AND GROUNDS RAISED

Petitioner respectfully requests review of claims 1-15 and 17-18 of the '430 patent and cancellation of these claims as unpatentable. The challenged claims should be found unpatentable on the following grounds:

Ground 1: Claims 1-3, 7, 11, 13-15 and 18 are unpatentable under 35 U.S.C. § 102(a)(2) as being anticipated by Li.

Ground 2: Claims 5-6 and 8-10 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Li in view of Lee.

Ground 3: Claim 12 is unpatentable under 35 U.S.C. § 103(a) as being obvious over Li in view of Zhao.

Ground 4: Claim 17 is unpatentable under 35 U.S.C. § 103(a) as being obvious over Li in view of Jiang.

Ground 5: Claims 1-4, 7, and 13 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Kim in view of Li.

Ground 6: Claims 5-6 and 8-10 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Kim and Li in view of Lee.

Ground 7: Claim 12 is unpatentable under 35 U.S.C. § 103(a) as being obvious over Kim and Li in view of Zhao.

Ground 8: Claim 17 is unpatentable under 35 U.S.C. § 103(a) as being obvious over Kim and Li in view of Jiang.

Ground 9: Claim 18 is unpatentable under 35 U.S.C. § 102(a)(2) as being anticipated by Kim.

For purposes of this proceeding only, Petitioner assumes the earliest effective filing date of the '430 patent is June 26, 2015, which is the foreign application priority date of Chinese Application No. CN 2015/10368321. (Ex. 1001, Cover.) Petitioner does not concede that the claims of the '430 patent are entitled to priority to CN 321. Nevertheless, the references below qualify as prior art even if the claims of the '430 patent were entitled to the benefit of the earliest claimed priority date.

Li published on June 20, 2013. Jiang published on February 6, 2013. Lee was granted a patent on July 24, 2018 from PCT Application No. PCT/KR/2015/001416 filed Feb. 12, 2015. Kim published on Dec. 22, 2016 from

U.S. App. No. 14/902,425 filed Jul. 1, 2014. Zhao published on December 11, 2014.

These references qualify as prior art under 35 U.S.C. § 102(a)(2).

A. The Board Should Not Exercise Discretion Under 35 U.S.C. § 325(d)

The exercise of discretion under § 325(d) involves a two-part framework set forth in *Advanced Bionics, LLC v. MED-EL Elektromedizinische Gerate GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”). With respect to Ground 1 (involving anticipation by Li), there is no dispute that Li was considered by the Examiner during prosecution and used as a basis for initially rejecting several claims. (*See, e.g.*, Ex. 1004 at 48-58.) Thus, the relevant question for Ground 1 is “whether the Petitioner sufficiently demonstrates that the Office erred” in its consideration of Li. *Advanced Bionics*, Paper 6 at 20. Petitioner respectfully submits that the Office materially erred in its consideration of Li because Li anticipates several claims and expressly discloses limitations the Office found missing from Li.

The Office rejected some of the as-filed claims, including then independent claim 1, over Li in view of Yang (US 2014/0133430). (Ex. 1004 at 52.) However, the Office indicated that neither Li nor Yang disclose claim 7 (*id.* at 57) and further that no prior art disclosed claim 21 (*id.* at 58), which depended from then claim 7 (*id.* at 386-393). In response, Applicant amended independent claim 1 to include the limitations of then existing claims 7 and 21. (*Id.* at 33-46.) The Office then allowed

the application. But, as explained below in Section IX.A, Li expressly discloses the features of then existing claims 7 and 21 that were incorporated into then existing claim 1 to obtain allowance. In fact, Li discloses the limitations of claims 7 and 21 in the description of Figure 6, which the Office identified in its rejection of claim 1 but failed to apply against claims 7 and 21.

Prior to allowance, claim 7 recited the feature of sending a message 3 according to the UL (uplink) grant allocated to the UE by the eNodeB. (Ex. 1004 at 388.) Li expressly discloses such a feature. For example, in step 603, “MTC UE1 may send a RRC connection request according to the T-CRNTI and RRC connection **UL resources** allocated by the communication network element.” (Ex. 1005, ¶[0126] (emphasis added); *see also id.*, ¶[0129].) The “UL resources” constitute an “Uplink (UL grant) allocated” to the MTC UE1. (Ex. 1002, ¶45.) As for claim 21, it recited that the message 3 comprises “a number of UEs the message 3 comprises a number of UEs having random access requests in the UE group **or** a number of UEs contained in the UE group **or** a pre-set UE number.” (Ex. 1004, 391 (emphasis added).) Li expressly discloses that message 3 includes a unique ID of the UE, i.e., a “pre-set UE number.” (*Infra* Section IX.A.1.vii.)

Thus, claim 1 of the '430 patent should not have been allowed over Li. Therefore, the Office should not exercise its discretion under § 325(d) because

Petitioner has demonstrated that the Office materially erred in its consideration of Li.

The Office should also not exercise its discretion because Petitioner presents grounds against the challenged claims that are based on prior art not before the Office. For example, Grounds 5, 6, 7, and 8 are based on Kim as the primary reference and Kim was not considered by the Office. (Ex. 1001 at 1, 2.) Similarly, grounds 2, 3, and 4 are based on secondary references such as Lee, Zhang, and Jiang that were also not considered by the Office. (*Id.*) Finally, the Office did not have the benefit of the testimony of Dr. Zhi Ding, a distinguished expert in the field, who explains in detail the prior art and why it discloses the claim limitations.

VI. LEVEL OF ORDINARY SKILL

A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the ’430 patent, which for purposes of this proceeding is the mid-2010s (including June 26, 2015), would have had an undergraduate degree in electrical engineering, computer engineering, computer science or a related field along with at least two years of work experience in the field of wireless communication

technology. (Ex. 1002, ¶¶23-24.)¹ More education can supplement practical experience and vice versa. (*Id.*)

VII. OVERVIEW OF THE '430 PATENT

A. The '430 Patent

The '430 patent relates to wireless communication technology and a method for requesting radio resource by a user equipment ("UE") from a base station ("eNB") over a time-frequency resource. (Ex. 1001, 1Abstract.) The '430 patent discloses a method of random access where the UE, which is part of a UE group, requests access to radio resources (i.e., a radio channel) from the eNB by sending a random access preamble message (msg. 1); the eNB responds to the preamble message by sending back a random access response (RAR) message to the UE (msg. 2); the UE then responds to the RAR by sending a message 3 identifying itself with a unique ID; the eNB then sends a back a confirmation message (msg. 4). (Ex. 1001, 11:40-12:20.) *See also id.*, FIGs. 1-2.

¹ Petitioner submits the declaration of Dr. Zhi Ding (Ex. 1002), an expert in the field of the '430 patent. (Ex. 1002 ¶¶3-17; Ex. 1003.)

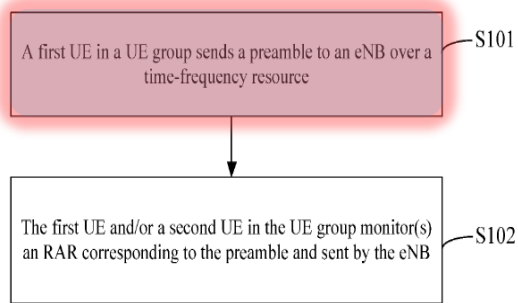


FIG. 1

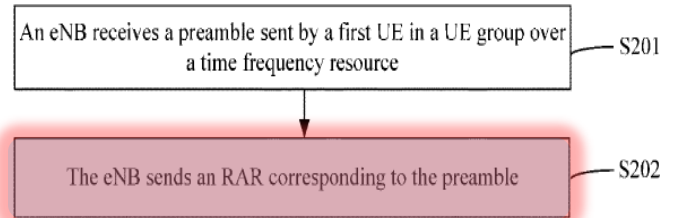


FIG. 2

VIII. CLAIM CONSTRUCTION

For IPR proceedings, the Board applies the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). See 83 Fed. Reg. 51,340-59 (Oct. 11, 2018). Under *Phillips*, claim terms are typically given their ordinary and customary meanings, as would have been understood by a POSITA, at the time of the invention, having taken into consideration the language of the claims, the specification, and the prosecution history of record. *Phillips*, 415 F.3d at 1313; *see also id.* at 1312-16.

The Board, however, only construes the claims when necessary to resolve the underlying controversy. *Toyota Motor Corp. v. Cellport Systems, Inc.*, IPR2015-00633, Paper No. 11 at 16 (P.T.A.B. Aug. 14, 2015) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). Here, given the correlation between the prior art and the challenged claims of the '430 patent, the Board need

not construe any terms of the challenged claims to resolve the underlying controversy, as any reasonable construction reads on the prior art.² (Ex. 1002, ¶¶xx-xx.)

IX. DETAILED EXPLANATION OF GROUNDS

As detailed below, each of the challenged claims are unpatentable.

A. Ground 1: Li Anticipates Claims 1-3, 7, 11, 13, 14, 15, and 18

1. Claim 1

i) [1.pre] “A random access method, comprising:”

To the extent the preamble of claim 1 is limiting, Li discloses the limitations therein. (Ex. 1002, ¶39.) Li is directed “to a method and system for accessing a network.” (Ex. 1005, ¶[0002].) In particular, “FIG. 6 is a schematic flowchart of a network access method according to another embodiment of the invention, showing contention based *random access*.” (*Id.*, ¶[0106] (emphasis added).)

² Petitioner reserves all rights to raise claim construction and other arguments in other venues. Specifically, Petitioner is not conceding that each claim satisfies all statutory requirements, nor waiving any arguments concerning claim scope or grounds that can only be raised in district court.

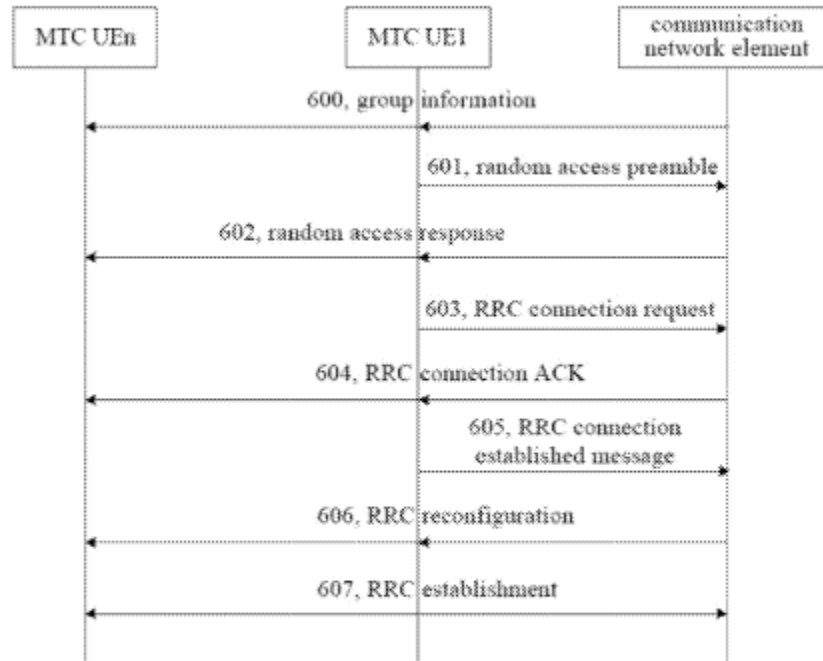


FIG. 6

(*Id.*, FIG. 6.)

- ii) [1.a] “sending, by a first User Equipment (UE) in a UE group, a preamble to an evolved Node B (eNB) over a time frequency resource;”

Li discloses or suggests this limitation. (Ex. 1002, ¶¶40-41.) For example, Li discloses a step 601, in which an “MTC UE1 may send a random access preamble to an eNodeB.” (Ex. 1005, ¶[0119].) MTC UE1 is part of “a group, such as MTC UE1, MTC UE2, MTC UEn, MTC UEm, where n and m are positive integers larger than or equal to 2.” (*Id.*, ¶[0117].)

Li discloses that the preamble is sent over a time and frequency resource. (Ex. 1002, ¶41.) Specifically, Li discloses that Figure 6 describes a “contention based random access” by taking the “LTE system as an example.” (Ex. 1005, ¶¶ [0107], [0109].) In LTE, random access is initiated over a “slot and frequency.” (*Id.*, ¶[0009].) And in “contention based random access,” the “UE may randomly select a random access frequency resource at a next time that allows random access, and then initiate a random access at the selected time-frequency position.” (*Id.*, ¶[0011].) Thus, Li discloses that the MTC UE1 sends the preamble to the eNodeB over a “random access frequency resource at a next time” slot (i.e., the claimed “time frequency resource”). (Ex. 1002, ¶41.)

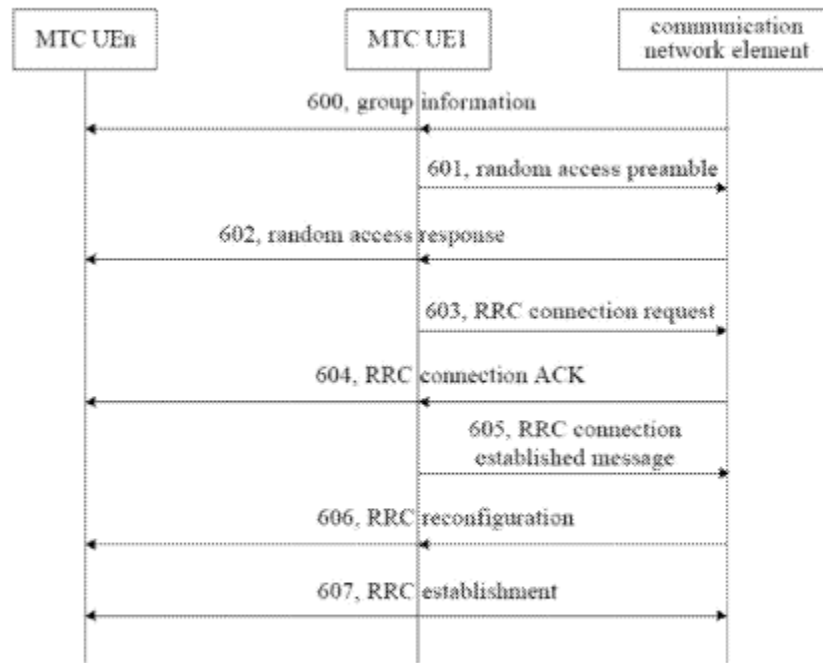


FIG. 6

(Ex. 1001, FIG. 6.)

iii) [1.b] “the time-frequency resource comprising a time domain resource and a frequency domain resource;”

Li discloses this limitation. (Ex. 1002, ¶42.) As discussed above, Li discloses that the MTC UE1 sends the preamble to the eNodeB over a time-frequency resource, i.e., over a “random access frequency resource” (claimed “frequency domain resource”) “at a next time” slot (claimed “time domain resource”).

iv) [1.c] “monitoring, by at least one of the first UE or a second UE in the UE group, a Random Access Response (RAR) corresponding to the preamble and sent by the eNB”

Li discloses this limitation. (Ex. 1002, ¶43.) After the MTC UE1 sends the preamble to the eNodeB in step 601, a random access response (RAR) is sent by the eNodeB to the MTC UE1. (Ex. 1005, ¶¶ [0120]-[0122].³) “Because all terminals in the group have the same random number, *all of other terminals* in the group except the first terminal can monitor the RAR to the first terminal. For example, MTC UEn monitors the RAR to the first terminal according to the RA-RNTI and the preamble ID.” (*Id.* (emphasis added)) The “first terminal” referenced in the previous sentence is MTC UE1, which corresponds to the claimed “first UE.” (*Id.*, ¶[0117].) Thus, Li discloses that “at least . . . a second UE in the UE group” monitors the RAR, sent by the eNB, corresponding to the preamble. The MTC UEn constitutes the “second UE.”

³ The RAR is sent by a “communication network element” (Ex. 1005, ¶[0120]) but that simply refers to the eNodeB (*id.*, ¶[0108].)

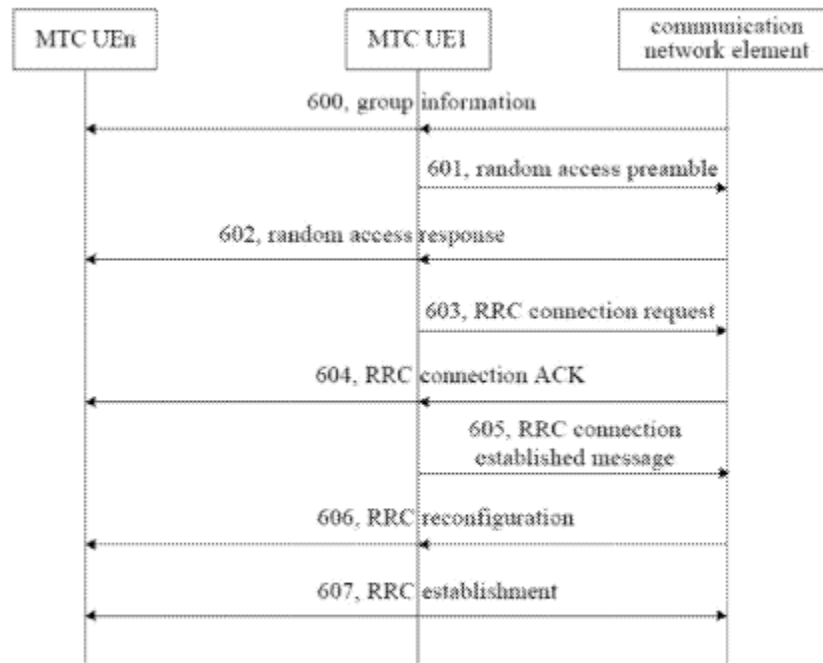


FIG. 6

(*Id.*, FIG. 6.)

- v) [1.d] “wherein the first UE is at least one UE in the UE group, and the second UE is all or some UEs in the UE group;”

Li discloses this limitation. (Ex. 1002, ¶44.) As discussed above, MTC UE1 (“first UE”) is part of a UE group and the MTC UEn constitute “second UE.”

- vi) [1.e] “after monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB, sending, by at least one of the first UE or the second UE, a message 3 according to a Uplink (UL) grant allocated thereto”

Li discloses this limitation. (Ex. 1002, ¶45.) In step 603, “MTC UE1 may send a RRC connection request according to the T-CRNTI and RRC connection *UL resources* allocated by the communication network element.” (Ex. 1005, ¶[0126] (emphasis added); *see also id.*, ¶[0129].) The “UL resources” constitute an “Uplink (UL grant) allocated” to the MTC UE1. (Ex. 1002, ¶45.) The RRC connection request is a “message 3” because the sending of the random access preamble is message 1 (step 601) and receiving of the random access response is message 2 (step 602). (*Id.*) The MTC UE1 is the “first UE.”

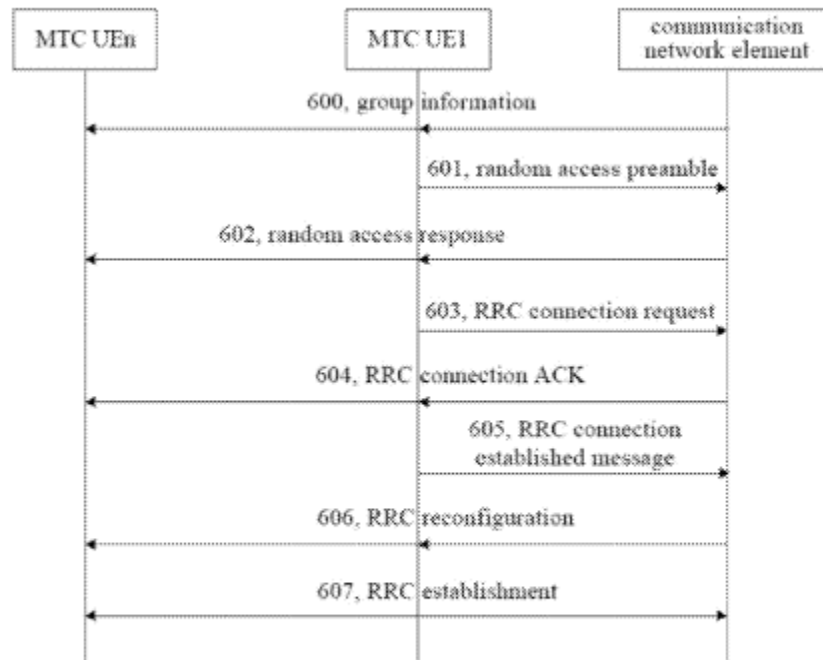


FIG. 6

(*Id.*, FIG. 6.)

- vii) **[1.f] “wherein the message 3 comprises a number of UEs having random access requests in the UE group or a number of UEs contained in the UE group or a pre-set UE number.”**

Li discloses this limitation. (Ex. 1002, ¶46.) The RRC connection request (message 3) includes “the terminal ID of MTC UE1.” (Ex. 1005, ¶[0128].) And the “terminal ID may be IMSI, MSISDN, IP address, IMPU, IMPI and any other symbol used to uniquely identify a terminal.” (*Id.*, 0066].) Thus, message 3 in Li includes a “pre-set UE number.”

2. **Claim 2: “The method according to claim 1, wherein the first UE is at least one of the following: at least one fixed UE; or, at least one UE determined according to a pre-set rule; or, at least one UE notified by the eNB.”**

Li discloses this claim. (Ex. 1002, ¶47.) Among the terminals in a group, a particular terminal is selected as MTC UE1 “according to a predetermined setting.” (Ex. 1005, ¶[0117].) Thus Li discloses that the first UE is a UE “determined according to a pre-set rule.”

3. **Claim 3: “The method according to claim 1, wherein at least one of the preamble, the time domain resource or the frequency domain resource is pre-set, or determined by a group Identifier (ID) of the UE group, or notified by the eNB.”**

Li discloses this claim. (Ex. 1002, ¶48.) For example, Li discloses that in LTE contention based random access, the “eNB may broadcast information about access resources by which random access may be initiated in a cell, and then UE

may randomly select an allowed preamble.” (Ex. 1005, ¶[0011].) Given that Figure 6 of Li is an example of LTE contention based random access (*id.*, ¶¶ [0107], [0109]), this disclosure applies to Figure 6. Thus, Li discloses that the preamble sent by MTC UE1 in step 601 is one that is “notified by the eNB.”

4. **Claim 7: “The method according to claim 1, further comprising: after sending, by at least one of the first UE or the second UE, the message 3 according to the UL grant allocated thereto, receiving, by at least one of the first UE or the second UE, a message 4 sent by the eNB.”**

Li discloses this claim. (Ex. 1002, ¶49.) In step 604, “the communication network element returns an ACK to MTC UE1, for example, a RRC Connection ACK. The ACK may comprise the terminal ID of MTC UE1 or the group ID of the group MTC UE1 belongs to or the synchronized random number.” (Ex. 1005, ¶[0131].) This RRC Connection ACK is a “message 4” sent by the eNB (communication network element).

5. **Claim 11: “The method according to claim 7, further comprising: after receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB, sending, by at least one of the first UE or the second UE, an indicating signal for notifying the eNB of a successful access of at least one of the first UE or the second UE to the eNB, wherein the indicating signal is a Scheduling Request (SR) or an Acknowledgement (ACK) signal.”**

Li discloses this claim. (Ex. 1002, ¶50.) Once the RRC connection ACK is received in step 604, the MTC UE 1 sends an “RRC connection established message” to the eNodeB in steps 605-606. (Ex. 1005, ¶[0133], [0134].) The “RRC

connection established message” is an “Acknowledgement (ACK) signal” as it indicates the successful establishment of an RRC connection.

6. Claim 13: “The method according to claim 7, wherein the message 3 and the message 4 comprise a group ID of the UE group or a preset field.”

Li discloses this claim. (Ex. 1002, ¶51.) As discussed above, the RRC connection request (message 3) sent in step 603 includes the terminal ID (“preset field”) of MTC UE 1. (*Supra* Section IX.A.1.vii.) Furthermore, in step 604, “the communication network element returns an ACK to MTC UE1, for example, a RRC Connection ACK. The ACK may comprise the *terminal ID* of MTC UE1 or the *group ID* of the group MTC UE1 belongs to or the synchronized random number.” (Ex. 1005, ¶[0131] (emphases added).) The ACK is message 4. (Ex. 1002, ¶51.)

7. Claim 14: “The method according to claim 1, further comprising: before sending, by the first UE in the UE group, the preamble over the time-frequency resource, receiving, by at least one of the first UE or the second UE, Downlink Control Information (DCI) or a paging message or a Radio Resource Control (RRC) message sent by the eNB; or, receiving, by the first UE, random access request information sent by the second UE.”

Li discloses claim 14. (Ex. 1002, ¶¶52-53.) Li discloses a step 601, in which an “MTC UE1 may send a random access preamble to an eNodeB.” (Ex. 1005, ¶[0119].) But prior to MTC UE1 sending a random access preamble in step 601, the MTC UE1 receives a group ID from the eNodeB in step 600. (Ex. 1005, ¶¶[0106]-[0112], FIG. 6.) For example, the communication network element “broadcasts

group information including group IDs of the groups or including group IDs of the groups and terminal IDs of all terminals in each group.” (*Id.*, ¶[0112].⁴) The MTC UE1 includes the receive group ID or the terminal ID in message 3 (RRC connection request) sent in step 603. (*Id.*, ¶¶[0125]-[0128].) The message containing “group ID” and the “terminal ID” constitutes Downlink Control Information (DCI), as confirmed by claim 15 of the ’430 patent, which recites that the DCI includes a group ID. (Ex. 1001, claim 15.) Furthermore, the group information is “broadcast” in step 600. (Ex. 1005, ¶[0112].) Such broadcast information constitutes a “paging” message, which claim 15 further confirms by noting that a “paging” message includes group ID. (Ex. 1002, ¶53.)

8. **Claim 15: “The method according to claim 14, wherein receiving, by at least one of the first UE or the second UE, the DCI or the paging message or the RRC message sent by the eNB comprises at least one of the following:**

the DCI or a CRC of DCI for scheduling the paging message or the RRC message is scrambled by using a group ID of the UE group;

the DCI or the paging message or the RRC message comprises a group ID of the UE group;

the DCI or the paging message or the RRC message comprises an ID of at least one of the first UE or the second UE; or

the DCI or the paging message or the RRC message

⁴ The “communication network element” refers to the eNodeB. (Ex. 1005, ¶[0108].)

comprises at least one of an ID of the preamble, the time domain resource of the preamble or the frequency domain resource of the preamble.”

Li discloses claim 15. (Ex. 1002, ¶54.) As discussed above, Li discloses that the terminals in the UE group (which includes MTC UE1) receive a group ID or a terminal ID from the eNodeB in step 600 before MTC UE1 send the preamble in step 601. (*Supra* Section IX.A.7, analysis for claim 14.) Thus, Li discloses that “the DCI or the paging message or the RRC message comprises a group ID of the UE group” and “the DCI or the paging message or the RRC message comprises an ID of at least one of the first UE or the second UE.”

9. Claim 18:

i) [18.pre] “A User Equipment (UE), comprising:”

To the extent this preamble is limiting, Li discloses the limitations therein. (Ex. 1002, ¶55.) “The terminal 800 may be a mobile terminal or a fixed terminal or a MTC terminal.” (Ex. 1005, ¶[0159].) “FIG. 9 is another schematic structure diagram of the terminal 800 according to another embodiment of the invention.” (*Id.*, ¶[0164].)

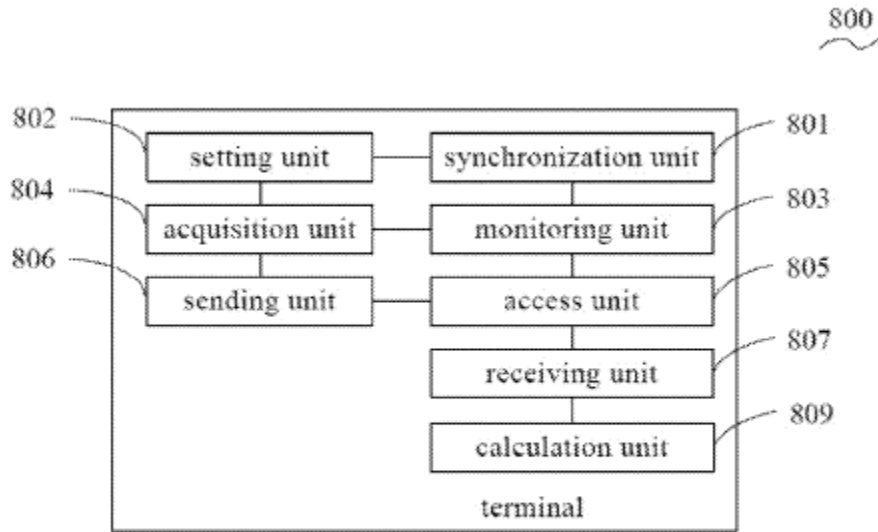


FIG. 9

(*Id.*, FIG. 9.)

ii) [18.a]: “a sending unit, and a monitoring unit,”⁵

⁵ Arguably, the terms “sending unit” and “monitoring unit” invoke §112(f) as being nonce terms and there is no corresponding structure (e.g., an algorithm) disclosed in the ’430 patent. For example, the ’430 patent merely notes that each “function unit . . . may be implemented by using a general computation apparatus.” (Ex. 1001, 29:44-46.) To the extent Patent Owner contends that an algorithm is disclosed, which includes the steps set forth below in the remaining limitation of claim 18, the prior art’s disclosure, discussed below, is commensurate with the extent to which any such algorithm is disclosed in the ’430 patent.

Li discloses this limitation. (Ex. 1002, ¶56.) Li discloses that the terminal includes a sending unit 806 and a monitoring unit 803. (*Id.*, ¶¶0175]-[0176].)

- iii) **[18.b] “wherein the sending unit is configured to : send a preamble to an evolved Node B (eNB) over a time-frequency resource , the time-frequency resource comprising a time domain resource and a frequency domain resource,”**

Li discloses this limitation. (Ex. 1002, ¶57.) Li discloses that the sending unit 806 is “for sending a preamble to the network.” (Ex. 1005, ¶[0176].) And Li discloses with reference to Figure 6 how the first terminal (MTC UE1) transmits a preamble to the eNB over a time and frequency resource. (*Supra* Section IX.A.1.ii-iii (analysis for limitations [1.a] and [1.b]).)

- iv) **[18.c] “the monitoring unit is configured to : monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB ;”**

Li discloses this limitation. (Ex. 1002, ¶58.) Li discloses that “the monitoring unit 803 is configured to monitor the RAR to the first terminal according to the RA-RNTI and the preamble ID.” (Ex. 1005, ¶[0175].) This is described in further detail with reference to Figure 6, which explains how the other terminals in the group monitor the random access response, sent by the eNB, corresponding to the preamble sent by MTC UE1. (*Supra* Section IX.A.1.iv (analysis for limitation [1.c]).)

- v) **[18.d] “the sending unit is further configured to : send a message 3 according to a Uplink (UL) grant allocated to the UE,”**

Li discloses this limitation. (Ex. 1002, ¶59.) Li discloses that “[a]fter the RAR sent from the network is received by the receiving unit 807, the sending unit 806 is further used to send RRC connection request . . . on the allocated RRC connection UL resources.” (Ex. 1005, ¶[0177].) This is described in further detail with reference to Figure 6, which explains the sending of a message 3 (RRC connection request) by the MTC UE1. (*Supra* Section IX.A.1.vi (analysis for limitation [1.e]).)

- vi) **[18.e] “wherein the message 3 comprises a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number.”**

Li discloses this limitation. (Ex. 1002, ¶60.) Li discloses that the RRC connection request . . . carries the terminal ID of the first terminal.” (Ex. 1005, ¶[0177].) This is described in further detail with reference to Figure 6, which explains the sending of a message 3 (RRC connection request) by the MTC UE1 includes the “terminal ID” of MTC UE1 and that is a “pre-set UE number.” (*Supra* Section IX.A.1.vii (analysis for limitation [1.f]).)

B. Ground 2: Claims 5, 6, and 8-10 Are Obvious over Li in view of Lee

1. Claim 5: “The method according to claim 1, wherein”⁶

Li in view of Lee discloses or suggests this limitation. (Ex. 1002, ¶¶61-69.)

- i) **[5.a] “monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB comprises:

(a) “descrambling, by at least one of the first UE or the second UE, a Cyclic Redundancy Check (CRC) of Downlink Control Information (DCI) for scheduling the RAR according to a pre-set Random Access Radio Network Temporary Identity (RA-RNTI) or an RA-RNTI corresponding to the preamble, and receiving the RAR, the RAR comprising at least one of at least one Temporary Cell Radio Network Temporary Identity (TC-RNTI) or at least one Uplink (UL) grant; and”**

As discussed above with respect to claim limitation [1.c], Li discloses that all terminals except the first terminal “can monitor the RAR to the first terminal.” (Ex. 1005, ¶[0122].) “The RAR may comprise at least one of TA (Timing Advance), T-CRNTI, next stage UL resource allocation (UL GRANT), and a preamble ID.” (*Id.*, ¶[0121].) Therefore, Li discloses “receiving the RAR, the RAR comprising at least

⁶ Claim 5 recites two alternatives separated by “or.” Petitioner groups these alternatives as claim limitation [5a] and [5b]. The prior art need only disclose [5a] or [5b].

one of at least one Temporary Cell Radio Network Temporary Identity (TCRNTI) or at least one Uplink (UL) grant,” as claimed.

To the extent Li is found to not expressly disclose the remaining limitations as recited in claim [5.a], Lee discloses them. Lee discloses a contention based random access procedure between a UE and an eNB. (Ex. 1007, 10:26-41, 14:30-53, 18:32-23:23.) Lee further discloses the individual transmissions of the general random access procedure, which include sending a random access preamble, receiving a random access response, a message 3, and a message 4. (*Id.*, 14:34-53, 18:32-23:23.) Moreover, Lee discloses that during such a procedure, the UE uses UE identifiers (RNTIs) such as the RA-RNTI and the TC-RNTI. (*Id.*, 12:47-62, 18:53-20:45, 21:5-22:15.) Given that both Li and Lee disclose random access procedure between a UE and an eNodeB, a POSITA would have reason to look to Lee to improve upon the teachings of Li. (Ex. 1002, ¶62.)

Lee discloses a contention-based random access procedure with reference to Figure 9. (Ex. 1007, 18:32-34.) Just like Li, message 2 in Lee’s random-access procedure is the random access response (RAR). (*Id.*, 19:1-10.) The RAR is delivered to the UE “through a PDSCH” (physical data shared channel). (*Id.*, 19:24-26.) To receive the RAR, the UE first detects a physical downlink control channel (PDCCH) “*masked with RA-RNTI*” and then “receives the PDSCH that is indicated

by the detected PDCCH.” (*Id.*, 19:18-33 (emphasis added).⁷) The PDCCH includes downlink control information (DCI). (*Id.*, 12:37-39.) Lee discloses that the PDCCH includes CRC bits “masked” (i.e., scrambled) with the UE’s RA-RNTI. (*Id.*, 12:47-62.) Thus, when receiving the PDCCH, the UE *descrambles* the CRC of the DCI because the CRC is masked (i.e., scrambled). (Ex. 1002, ¶63.) This is what Lee means by the “UE . . . detects the PDCCH masked with RA-RNTI.” (Ex. 1007, 19:18-24.)

In view of the above, Lee discloses the following: the PDCCH has CRC that is scrambled; the UE descrambles the CRC of the PDCCH using the RA-RNTI associated with the UE’s transmitted preamble; the PDCCH comprises DCI and indicates the PDSCH, which includes the RAR. Therefore, Lee discloses “descrambling, by at least one of the first UE or the second UE, a Cyclic Redundancy Check (CRC) of Downlink Control Information (DCI) for scheduling the RAR according to a . . . Random Access Radio Network Temporary Identity (RA-RNTI) or an RA-RNTI corresponding to the preamble. . . ,” as claimed. The PDCCH is “for scheduling the RAR” because the “PDSCH . . . is indicated by the detected

⁷ In the context of the ’430 patent, masking and scrambling refer to the same operation. (Ex. 1002, ¶63.) For example, the ’430 patent refers to “masking or scrambling.” (Ex. 1001, 13:58-60, 15:11.)

PDCCH” and the RAR is received via the PDSCH. (*Id.*, 19:18-33.) Furthermore, the RA-RNTI corresponds to the preamble, as claimed because the base station (i.e., eNodeB) “decodes the preamble and obtains an RA-RNTI.” (*Id.*, 18:53-67.)

Having looked at Lee, a POSITA would have been motivated to combine Li’s teachings with those of Lee to enable Li’s UE to receive the random access response designated for it. (Ex. 1002, ¶¶64-65.) Lee’s teachings concern the same random access process (including message 1, message 2, and message 3) as described by Li. (*Id.*) Lee provides additional disclosure relating to the transmission of the random access response (message 2) in Li. (*Id.*) As described above, Lee teaches that a random access response is delivered via a PDSCH, which is indicated by a PDCCH detected by the UE. (*Id.*) Importantly, a PDCCH has associated CRC bits that are scrambled using an identifier unique to the UE to which that PDCCH is directed. (*Id.*) This enables the correct UE to receive the PDCCH intended for it because only that UE correctly descrambles the CRC bits of the PDCCH. (*Id.*) Indeed, combining the teachings of Lee with Li would have been obvious because it would have constituted applying a known feature (Lee’s techniques) to a particular device (the Li eNB and UEs) to achieve a predictable result (enabling reception of a random access response by the UE to which the response is directed). (*Id.*); *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416-18 (2007).

A POSITA would have had a reasonable expectation of success implementing such a combination. (Ex. 1002, ¶66.) For example, a POSITA knew how to implement scrambling and descrambling of DCI, and further knew how PDCCH and PUSCH operated in the context of random access. (*Id.*) Utilizing Lee’s techniques with Li would have been well within the skills of a POSITA, because, for example, a POSITA would have merely needed to perform basic programming to configure Li’s eNodeB and UEs to utilize Lee’s above-noted techniques. (*Id.*)

Thus, Li in combination with Lee discloses or suggests the limitation. (Ex. 1002, ¶xx.)

(b) “determining, by at least one of the first UE or the second UE, at least one of a TC-RNTI or UL grant allocated thereto according to at least one of at least one TC-RNTI or at least one UL grant contained in the RAR; or”

Li discloses that the MTC UE1 utilizes the T-CRNTI and the UL grant resources allocated to it by the eNodeB in the RAR. (Ex. 1005, ¶¶[0125]-[0129].) Thus, Li discloses that the MTC UE1 determines the TC-RNTI and the UL grant from the information in the RAR.

- ii) **[5.b] “monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB comprises: determining, by at least one of the first UE or the second UE, corresponding RA-RNTIs according to at least one of respective IDs or preambles, descrambling a CRC of DCI for scheduling the RAR**

according to the corresponding RA-RNTIs, and receiving corresponding RARs, the RAR comprising at least one of a TC-RNTI or a UL grant allocated to the first UE or second UE.”

This is an optional feature and need not be disclosed because [5.a] is disclosed.

2. **Claim 6: “The method according to claim 5, wherein determining, by at least one of the first UE or the second UE, at least one of the TC-RNTI or the UL grant allocated thereto according to at least one of at least one TC-RNTI or at least one UL grant contained in the RAR comprises: determining, by at least one of the first UE or the second UE, at least one of a TC-RNTI or a UL grant allocated thereto according to at least one of an ID of the first UE or the second UE in accordance with a pre-set rule.”**

Li in combination with Lee discloses or suggests this claim. (Ex. 1002, ¶¶70-71.) Li discloses that the MTC UE1 utilizes the T-CRNTI and the UL grant resources allocated to it by the eNodeB in the RAR. (Ex. 1005, ¶¶[0125]-[0129].) Thus, Li discloses that the MTC UE1 determines the T-CRNTI and the UL grant from the information in the RAR. To the extent Li is not found to expressly disclose that this TC-RNTI and UL grant are determined “according to at least one of an ID of the first UE or the second UE in accordance with a pre-set rule,” as claimed, the Li-Lee combination discloses such a feature.

For example, in the Li-Lee combination discussed above with respect to claim 5 in Section IX.B.1, the UE detects the PDCCH to receive the RAR, and more specifically, the “UE . . . detects the PDCCH masked with RA-RNTI.” (Ex. 1007, 19:18-24.) The RA-RNTI is an “ID” of the UE because an RNTI is a “unique

identity given to a terminal.” (*Id.*, 19:33-35.) Therefore, the RAR (and its contents including the T-CRNTI and the UL grant) are determined “according to at least one of an ID of the first UE or the second UE in accordance with a pre-set rule,” as claimed. (Ex. 1002, ¶¶71.)

3. **Claim 8: “The method according to claim 7, wherein receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB comprises: scrambling a CRC of DCI for scheduling the message 4 by using a TC-RNTI allocated to at least one of the first UE or the second UE.”**

Li in view of Lee discloses or suggests this claim. (Ex. 1002, ¶¶72-74.) As discussed above with respect to claim 7, an RRC Connection ACK is a “message 4” sent by the eNB (communication network element). To the extent it is argued that Li does not expressly disclose “scrambling a CRC of DCI for scheduling the message 4 by using a TC-RNTI allocated to at least one of the first UE or the second UE” as recited in claim 8, Lee discloses such a feature. Specifically, Lee discloses that a message 4 pertaining to contention resolution is transmitted by the eNodeB to the UE after receiving message 3. (Ex. 1007, 21:47-22:15.) And transmission of message 4 involves the transmission of a PDCCH by the eNodeB, which the UE attempts to receive “using the TC-RNTI” of the UE. (*Id.*) As discussed above with respect to claim 5 in Section IX.B.1, a POSITA would have understood that “using the TC-RNTI” means that the CRC bits of the PDCCH are scrambled by the eNodeB

using the “TC-RNTI,” and the UE then uses the same TC-RNTI to descramble the CRC bits and receive the PDCCH. (Ex. 1002, ¶72.)

A POSITA would have been motivated to combine Li with Lee’s teachings of scrambling a CRC of DCI for scheduling the message 4 by using a TC-RNTI allocated to the first UE, in view of Lee’s similarity to Li. (Section IX.B.1.i, *supra* (explaining similarities between Li and Lee.)) (Ex. 1002, ¶73.) Having looked at Lee, a POSITA would have been motivated to enable Li’s eNodeB to scramble a CRC of DCI for scheduling the message 4 according to the teachings of Lee. (*Id.*) Specifically, by scrambling the CRC, the eNodeB can “resolve contention” with the “relevant UE” that has not been assigned a C-RNTI. (Ex. 1007, 21:48-22:15.) Thus, a POSITA would have been motivated to enable Li’s eNodeB to scramble the CRC bits added to a PDCCH because scrambling them allows the PDCCH to be received by the intended UE (in this case, MTC UE1) and a POSITA would have been able to make the relevant changes to Li’s system to implement such a modification. (Ex. 1002, ¶73.)

4. **Claim 9: “The method according to claim 8, wherein the message 4 comprises at least one set of radio resources, radio resources allocated to at least one of the first UE or the second UE are determined by at least one of the first UE or the second UE according to at least one set of radio**

resources in the message 4; or the message 4 comprises a set of radio resources allocated to the first UE or second UE.”

Li in combination with Lee discloses or suggests this claim. (Ex. 1002, ¶¶75-78.) As discussed above with respect to claim 7, Li discloses that in step 604, the eNB returns an RRC connection ACK to the MTC UE1. (Ex. 1005, ¶[0131].) This RRC Connection ACK is a “message 4.” After this message 4, an RRC connection established message is returned by the MTC UE1 to the eNB, and in response the eNB transmits an RRC connection reconfiguration message that allocates “resources,” such as “group based signaling radio bearers (SRB) and group based dedicated radio bearers (DRB)” to the “other terminals in the group except MTC UE1.” (Ex. 1005, ¶¶[0133], [0134], FIG. 6.) As noted above in Section IX.A.1.v (claim [1.d]), these other terminals constitute a “second UE.” Thus, Li discloses “a set of radio resources allocated to the first UE or second UE.” To the extent it is argued that Li does not expressly include this set of radio resources in “message 4,” as claimed, such a feature would have been obvious based on Lee.

Lee discloses an RRC connection setup message as a message 4. (Ex. 1007, 14:51-53.) “The RRC connection setup message includes configuration information for setting SRB1” and “by transmitting the RRC connection setup message to the terminal” (the UE), the “BS” (eNB) “allocates SRB (e.g., SRB 1) configuration resource to be dedicatedly used by the terminal.” (*Id.*, 14:63-67.) The SRB resources are just like those provided by the RRC reconfiguration message in Li.

A POSITA would have been motivated to modify Li to include in Li's message 4 in step 604 the set of radio resources transmitted in step 606. (Ex. 1002, ¶78.) Specifically, by assigning to Li's MTC UE1 the radio resources included in message 4, the UE can transition to an RRC connected state. (Ex. 1007, 15:24-30.) And the UE can do so without the need for another round of messages with the eNB. (Ex. 1002, ¶78.) Such a change would have reduced the number of steps required for establishing an RRC connection between the UEs and the eNodeB, and would have reduced network congestion by way of reducing the number of messages transmitted on the network. (*Id.*) And a POSITA would have been able to implement any such change with reasonable success because, for example, such a change would simply require modifying a message sequence, which can be accomplished by basic programming. (*Id.*)

5. **Claim 10: “The method according to claim 9, wherein the radio resources allocated to at least one of the first UE or the second UE are further determined by at least one of the first UE or the second UE according to an ID of at least one**

of the first UE or the second UE in accordance with a pre-set rule.”

Li in combination with Lee discloses or suggests this claim.⁸ (Ex. 1002, ¶¶79-80.) For example, as discussed above with respect to claim 9, in the Li-Lee combination, the second UE (i.e., Li’s UEs other than MTC UE1) receive radio resources (group based SRB and DRB) allocated thereto by the eNodeB. (*Supra* Section IX.B.4.) These other terminals “may initiate network access using the RRC connection UL resources allocated by the communication network element,” (i.e., eNodeB). (Ex. 1005, ¶[0136].) Because the other terminals (i.e., “second UE”) use these RRC resources, the radio resources are necessarily determined by the second UE.

Furthermore, in the Li-Lee combination, the message 4 is deciphered by the UEs using a TC-RNTI of the UEs. (*Supra* Section IX.B.3.) Because message 4

⁸ Claim 10 requires “the radio resources allocated to at least one of the first UE **OR** the second UE are further determined by at least one of the first UE **OR** the second UE according to an ID of at least one of the first UE **OR** the second UE in accordance with a pre-set rule.” (Ex. 1001, claim 10 (emphasis added).) Therefore, the prior art reference need only teach the radio resources allocated to the first UE are further determined by the first UE according to an ID of at least one of the first UE in accordance with a pre-set rule to teach Claim 10.

includes the radio resources (*supra* Section IX.B.4) in the Li-Lee combination, the radio resources in the message 4 are determined by the UEs in accordance with an ID thereof (i.e., the TC-RNTI) according to a pre-set rule (which is that the UEs with the correct TC-RNTI are able to descramble and decode the PDCCH corresponding to message 4). In other words, the Li-Lee combination disclose or suggests “the radio resources allocated to at least one of the first UE or the second UE are further determined by at least one of the first UE or the second UE according to an ID of at least one of the first UE or the second UE in accordance with a pre-set rule.”

C. Ground 3: Claim 12 Is Obvious over Li in view of Zhao

- 1. Claim 12: “The method according to claim 7, further comprising: after receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB, receiving, by at least one of the first UE or the second UE, indicating information, sent by the eNB, for indicating re-initiation of a random access of at least one of the first UE or the second UE.”**

Li in combination with Zhao discloses or suggests claim 12. (Ex. 1002, ¶¶81-84.) As discussed above with respect to claim 7, Li’s MTC UE1 receives a message 4 from the eNodeB. Specifically, in step 604, the eNodeB “returns an ACK to MTC UE1, for example, a RRC Connection ACK.” (Ex. 1005, ¶[0131].) Li does not, however, expressly disclose what happens if an ACK is not received from the eNodeB. (Ex. 1002, ¶85.) For example, Li does not expressly disclose what happens if the eNodeB does not properly receive message 3 from the MTC UE1. (*Id.*) Zhao,

however, discloses a random access procedure like Li's but in which the eNodeB orders the UE to restart the random access procedure by resending a preamble.

Zhao discloses "random access procedures in wireless telecommunication networks and has particular relevant to random access procedures between a user equipment and radio access node" in LTE. (Ex. 1012, ¶[0001].) A radio access node (RAN) refers to an eNodeB. (*Id.*, ¶[0002].) Zhao discloses a random access procedure between a UE and an eNodeB with respect to Figure 4. In particular, the RAN 10 receives a preamble from the UE as part of MSG1 and responds with a MSG2 (which is the random access response). (*Id.*, ¶[0031].) "The UE . . . then responds by sending a third message (MSG3)" to the RAN. (*Id.*) But if the RAN fails to detect MSG3, it sends a HARQ NACK (*id.*) which is equivalent to a message 4, and the opposite of Li's ACK. (Ex. 1002, ¶82.) After sending the HARQ NACK, the eNodeB sends a "direct order" in step 80 to the UE "to restart the random access procedure with the same preamble." (Ex. 1012, ¶[0031].) This procedure has the benefit of enabling the UE "to synchronize with the network." (*Id.*) Therefore, Zhao discloses "after receiving, by at least one of the first UE or the second UE, the message 4 sent by the eNB, receiving, by at least one of the first UE or the second UE, indicating information, sent by the eNB, for indicating re-initiation of a random access of at least one of the first UE or the second UE," as claimed.

Given that Zhao also discloses a random access procedure for LTE like Li, a POSITA would have reason to look to Zhao to fill in the gaps in Li's disclosure. (Ex. 1002, ¶83.) Having looked to Zhao, a POSITA would have been motivated to modify Li's random access procedure to incorporate Zhao's teachings regarding the eNodeB's instruction/command to the UE to restart random access procedure when, for example, message 3 is not successfully received or processed by the eNodeB. (*Id.*) In such a combination, Li's eNodeB would send a NACK in message 4 (as opposed to an ACK, as disclosed in Li), and follow-up with a direct order to restart random access, like in Zhao. (*Id.*) Incorporating such a technique in Li's disclosure would have provided the benefit of enabling the MTC UE1 "to synchronize with the network" in the event of the eNodeB not receiving or failing to process message 3. (*Id.*) A POSITA would have had a reasonable expectation of success in performing this modification of Li in view of Zhao given such a person's skill and the teachings of Zhao. (*Id.*)

The above Li-Zhao combination discloses or suggests claim 12. (Ex. 1002, ¶¶84.)

D. Ground 4: Claim 17 Is Obvious over Li in view of Jiang

- 1. Claim 17: "The method according to claim 1, wherein sending, by the first UE in the UE group, the preamble over the time-frequency resource comprises: periodically**

sending, by the first UE, the preamble over the frequency domain resource.”

Li in combination with Jiang discloses or suggests claim 17. (Ex. 1002, ¶¶85-87.) Li does not expressly disclose what happens if a random access response is not received by MTC UE1 in step 602, after sending a random access preamble in step 601. (Ex. 1002, ¶85.) Jiang, however, discloses a similar setup as Li and in particular, explains that if a response is not received from the network side (i.e., from the eNodeB) within “a given time,” then the MTC terminal “can repeatedly send the Preamble.” (Ex. 1006, ¶[0044].)

Like Li, Jiang also discloses a random access procedure for MTC terminals belonging to a group. (*See id.*, ¶¶[0036]-[0038].) Like Li, Jiang discloses a random access process involving message 1 (sending of the random access preamble to the base station/eNB by the MTC UE), message 2 (random access response from the base station), message 3 (RRC connection request), and a message 4. (*Id.*, ¶¶[0039]-[0056].) Thus, a POSITA would have reason to look to Jiang to improve upon or fill in gaps in the disclosure of Li. (Ex. 1002, ¶86.) Having looked to Jiang, a POSITA would have been motivated to combine the teachings of Li and Jiang to incorporate in Li, Jiang’s feature of repeatedly sending the Preamble if a random access response is not received from the eNodeB within a predetermined time interval. (*Id.*) Doing so would have allowed the MTC UE1 in Li to continue to request a connection within the eNodeB in the absence of a response to the

transmitted preamble within a given time window. (*Id.*) A POSITA would have had a reasonable expectation of success in performing this modification of Li in view of Jiang given such a person's skill and the teachings of Jiang. (*Id.*)

E. Ground 5: Claims 1-4, 7, and 13 Are Obvious over Kim in view of Li

1. Claim 1

i) [1.pre] “A random access method, comprising:”

To the extent the preamble of claim 1 is limiting, Kim teaches or discloses the limitations therein. (Ex. 1002, ¶88.) Kim discloses a method for performing a random access. (Ex. 1011, ¶[0083] (“FIG. 5 is a diagram illustrating operations of the UE and the eNB performed in the condition[*sic*]-based random access procedure.”).⁹)

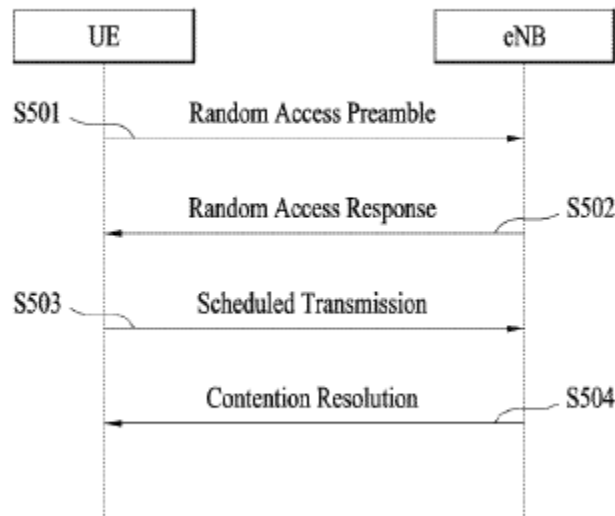
ii) [1.a] “sending, by a first User Equipment (UE) in a UE group, a preamble to an evolved Node B (eNB) over a time frequency resource;”

Kim in combination with Li discloses or suggests this limitation. (Ex. 1002, ¶¶89-93.) Kim discloses that the UE transmits a random access preamble to the eNodeB over a PRACH resource in step 501. (Ex. 1011, ¶¶[0084]-[0085].) A PRACH refers “to a set of time-frequency resources.” (*Id.*, ¶[0054].) Therefore,

⁹ A POSITA would have understood that this is a typographical error and Kim meant “contention” as opposed to “condition.” (Ex. 1002, ¶88.)

Kim discloses “sending, by a first User Equipment (UE) . . . , a preamble to an evolved Node B (eNB) over a time frequency resource.”

FIG. 5



(*Id.*, FIG. 5.)

To the extent it is found that Kim does not expressly disclose that the UE is “in a UE group,” as recited in claim [1.a], a POSITA would have been motivated to include Kim’s UE as part of a UE group along with other UEs in view of Li’s teachings. (Ex. 1002, ¶90.) For example, Li discloses a group of UEs “such as MTC UE1, MTC UE2, MTC UEn, MTC UEm, where n and m are positive integers larger than or equal to 2.” (Ex. 1005, ¶[0117].) And Li further discloses a random access procedure implemented by the MTC UEs for communicating with an eNodeB. (*Id.*, ¶¶[0107]-[0133].) Given that both Kim and Li disclose random access procedure

between a UE and an eNodeB, a POSITA would have reason to look to Li to improve upon the teachings of Kim. (Ex. 1002, ¶90.)

Having looked at Li, a POSITA would have been motivated to include Kim’s UE as part of a group of UEs because that would have increased the efficiency of the network. (*Id.*, ¶91.) Specifically, it was well-known that “when too many users initiate access attempts simultaneously, multiple UEs may select the same random access resource, causing significantly increasing of average access delay for users. Meanwhile, a large amount of re-initiated access attempts may cause large overheads on UEs and eNB.” (Ex. 1005, ¶[0022]; *see also id.*, ¶[0023].) By grouping UEs into UE groups (*id.*, ¶¶[0025]-[0028]), Li reduces “user access delay and lower[] the signaling overhead for signaling connection and data bearer establishment.” (*Id.*, ¶[0024]; *see also id.*, ¶[0092].) Indeed, combining the teachings of Kim with Li would have been obvious because it would have constituted applying a known feature (Li’s grouping technique) to a particular device (the system described in Kim) to achieve a predictable result (enabling random access by a group of UEs). (*Id.*); *KSR*, 550 U.S. at 416-18.

In the above Kim-Li combination, Kim’s UE could serve the same role as Li’s MTC UE1, which engages with the eNodeB to establish a connection (*supra* Section IX.A.1 (explaining the message sequence between MTC UE1 and the eNodeB as

part of random access)). (Ex. 1002, ¶92.) In other words, Kim’s UE constitutes “a first User Equipment (UE) in a UE group” in the Kim-Li combination.

iii) [1.b] “the time-frequency resource comprising a time domain resource and a frequency domain resource;”

Kim in view of Li discloses or suggests this limitation. (Ex. 1002, ¶94.) As discussed above, Kim discloses that the UE transmits a random access preamble to the eNodeB over a PRACH resource in step 501. (Ex. 1011, ¶[0084]-[0085].) A PRACH refers “to a set of time-frequency resources.” (*Id.*, ¶[0054].) A POSITA would have understood that “time-frequency” resources refer to a time domain (such as time slot) and a frequency domain resource. (Ex. 1002, ¶94.) The inclusion of Kim’s UE as part of a group would not have altered this aspect of Kim’s disclosure given that Li discloses a similar transmission of a random access preamble over time-frequency resources. (*Supra* Section IX.A.1.ii.)

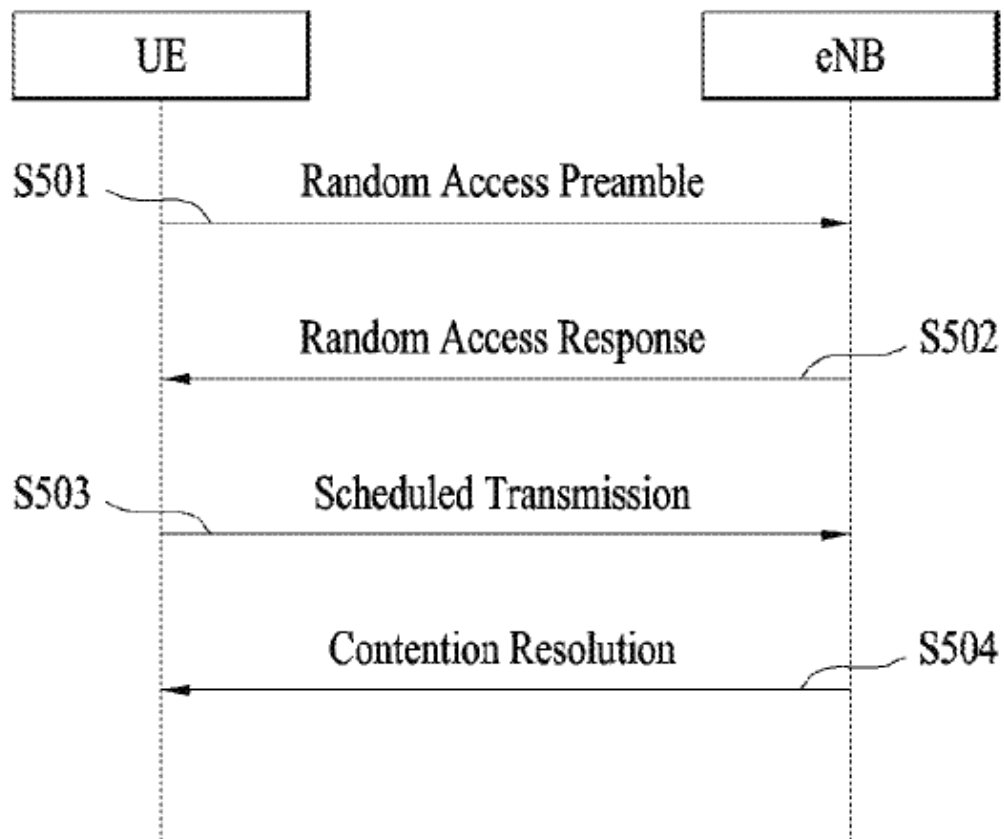
iv) [1.c] “monitoring, by at least one of the first UE or a second UE in the UE group, a Random Access Response (RAR) corresponding to the preamble and sent by the eNB”

Kim in view of Li discloses or suggests this limitation. (Ex. 1002, ¶¶95-96.) For example, Kim discloses that “after transmitting the random access preamble as performed in step S401, the UE attempts to receive a random access response thereof within a random access response reception window Thereby, the UE may

receive a UL grant, a temporary C-RNTI and a TAC.” (Ex. 1011, ¶[0087], FIG. 5.¹⁰)

As clear from Figure 5, the RAR is received from the eNB. Therefore, Kim discloses “monitoring” by the UE “a Random Access Response (RAR) corresponding to the preamble and sent by the eNB,” as claimed.

FIG. 5

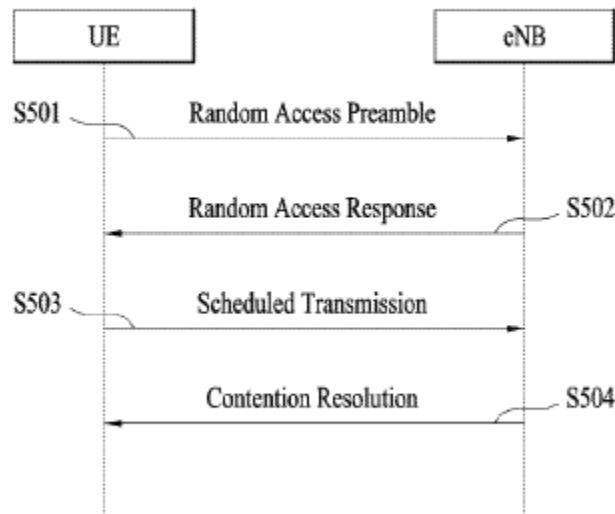


¹⁰ A POSITA would have understood that “S401” is a typographical error; instead, Kim intended to recite “S501” as evident from Figure 5. (Ex 1002, ¶95.)

(*Id.*, FIG. 5.)

Kim in combination with Li discloses that Kim's UE is part of a UE group (*supra* Section IX.E.1.ii (explaining that Kim's UE would be the "first UE" in the "UE group") and the inclusion of Kim's UE as part of a UE group in view of Li does not affect this operation of Kim, as evidenced by a similar description of the random access response step in Li. (Ex. 1002, ¶96; *supra* Section IX.A.1.iii.) Therefore, Kim further discloses that the UE that monitors the RAR is "at least one of the first UE or a second UE in the UE group," as claimed.

FIG. 5



(Ex. 1011, FIG. 5.)

- v) [1.d] “wherein the first UE is at least one UE in the UE group, and the second UE is all or some UEs in the UE group;”

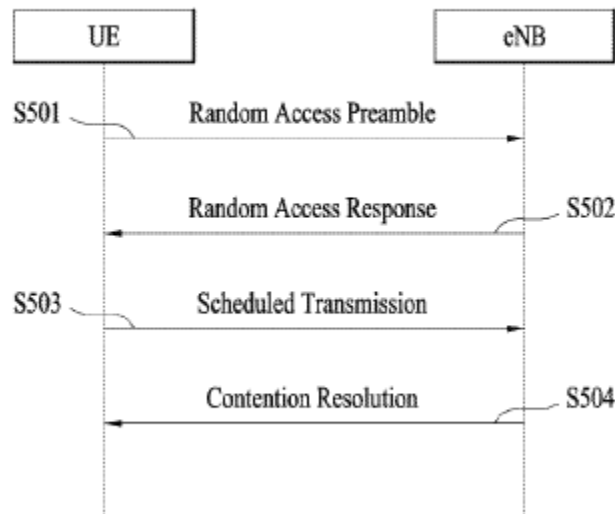
Kim in view of Li discloses or suggests this limitation. (Ex. 1002, ¶97.) As discussed above, Li discloses that MTC UE1 is part of “a group, such as MTC UE1, MTC UE2, MTC UEn, MTC UEm, where n and m are positive integers larger than or equal to 2.” (Ex. 1005, ¶[0117].) Moreover, the RAR is monitored by “MTC UEn” (*id.*, ¶[0122]), which refers to “other terminals except the first terminal [MTC UE1]” (*id.*, ¶[0117].) Because Kim’s teachings are combined with Li such that Kim’s UE is part of a group of UEs like in Li, the Kim-Li combination discloses limitation [1.d]. (*Supra* Section IX.E.1.ii.) In particular, Kim in combination with Li discloses that Kim’s UE is the “first UE” in the “UE group” just like Li’s MTC UE1 is the “first UE” in the UE group with all other UE’s constituting the “second UE.” (*Id.*)

- vi) **[1.e] “after monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB, sending, by at least one of the first UE or the second UE, a message 3 according to a Uplink (UL) grant allocated thereto”**

Kim in view of Li discloses or suggests this limitation. (Ex. 1002, ¶98.) Kim discloses that “[i]f the UE receives a valid random access response, the UE processes the information included in the random access response. That is, the UE applies the TAC and stores the temporary C-RNTI. In addition, the UE transmits data (i.e.,

message 3) to the eNB using the UL grant (S403).” (Ex. 1011, ¶¶[0089].¹¹) This discloses that Kim’s UE monitors the RAR from the eNB, which is sent in response to the preamble, and transmits a message 3 according to the UL grant in the RAR. The inclusion of Kim’s UE as part of a UE group in view of Li does not affect this operation of Kim, as evidenced by a similar description of the random access response step in Li. (Ex. 1002, ¶98; *supra* Section IX.A.1.vi.) Again, Kim’s UE constitutes the “first UE” in the Kim-Li combination. (*Supra* Section IX.E.1.ii.)

FIG. 5



(Ex. 1011, FIG. 5.)

vii) [1.f] “wherein the message 3 comprises a number of

¹¹ A POSITA would have understood that “S403” is a typographical error; instead, Kim intended to recite “S503” as evident from Figure 5. (Ex 1002, ¶98.)

**UEs having random access requests in the UE group
or a number of UEs contained in the UE group or a
pre-set UE number. ”**

Kim in view of Li discloses or suggests this limitation. (Ex. 1002, ¶99.)¹² Kim discloses that “[m]essage 3 should include an ID of the UE. This is because the eNB cannot determine which UEs perform the random access procedure in the contention-based random access procedure and the UEs need to be identified for future contention resolution.” (Ex. 1011, ¶[0089].) The UE ID may be a “unique ID (e.g., System Architecture Evolution (SAE)-Temporary Mobile Subscriber Identity (S-TMSI) or a random ID).” (*Id.*, ¶[0090].) The UE ID is a “pre-set UE number.” The inclusion of Kim’s UE as part of a UE group in view of Li does not affect this operation of Kim, as evidenced by a similar description of the random access response step in Li. (Ex. 1002, ¶99; *supra* Section IX.A.1.vii.)

¹² Claim limitation [1.f] requires “a number of UEs having random access requests in the UE group **OR** a number of UEs contained in the UE group **OR** a pre-set UE number.” (Ex. 1001, claim 1 (emphasis added).) Therefore, the prior art reference need only disclose a pre-set UE number to anticipate claim limitation [1.f].

2. Claim 2¹³

Kim in view of Li discloses or suggests this claim. (Ex. 1002, ¶100.) Kim discloses that the “random access preamble” sent by the UE in step 501 is selected “from a set of random access preambles indicated through system information.” (Ex. 1011, ¶¶[0085].) The system information is provided by the eNodeB. (*See, e.g., id.*, ¶¶[0080].) Thus, Kim’s UE, which is the “first UE” in the combination with Li, is one that is “notified by the eNB,” as claimed. Furthermore, Kim discloses that the UE may be selected as a “transmission (TX) UE performing D2D communication” and the “eNB may assign a resource” to such Tx UE. (*Id.*, ¶[0092].) For this additional reason, Kim discloses that at least one UE determined according to a pre-set rule. The inclusion of Kim’s UE as part of a UE group in view of Li would not have affected this operation of Kim because the UEs still need access to random access preambles and it is the eNodeB that provides them. (Ex. 1002, ¶100.)

3. Claim 3

Kim in view of Li discloses or suggests this claim. (Ex. 1002, ¶101.) As discussed above with respect to claim 2, Kim discloses that the “random access preamble” sent by the UE in step 501 is selected “from a set of random access

¹³ Beginning from claim 2 of Ground 5, Petitioner does not repeat the claim language if it is reproduced in prior grounds.

preambles indicated through system information.” (Ex. 1011, ¶¶[0085].) And the system information is notified by the eNodeB. (*See, e.g., id.*, ¶¶[0080].)

4. Claim 4: “The method according to claim 3, wherein at least one of the preamble, the time domain resource or the frequency domain resource corresponds to the number of UEs having random access requests in the UE group or the number of UEs contained in the UE group or the pre-set UE number.”

Kim in view of Li discloses or suggests this limitation. (Ex. 1002, ¶102.) Kim discloses that “transmission of msg1 ... may be performed using a time and resource determined based on a unique attribute (e.g., ID) of the UE.” (Ex. 1011, ¶[0188].)

5. Claim 7

Kim in view of Li discloses or suggests this claim. (Ex. 1002, ¶103.) Kim discloses that the UE receives a message 4 after sending message 3. (Ex. 1011, ¶¶[0091]-[0092], FIG. 5.) The inclusion of Kim’s UE as part of a UE group in view of Li does not affect this operation of Kim, as evidenced by a similar description of the random access response step in Li. (Ex. 1002, ¶103.)

6. Claim 13

Kim in view of Li discloses or suggests this claim. (Ex. 1002, ¶104.) As discussed above with respect to claim [1.f], message 3 includes the UE’s ID. (*Supra* Section IX.E.1.vii.) The UE’s ID is a “preset field.” Kim further discloses that the data of message “contains the unique ID of the UE.” (Ex. 1011, ¶[0092].)

F. Ground 6: Claims 5, 6, and 8-10 Are Obvious over Kim in view of Li and Lee

1. Claim 5: “The method according to claim 1, wherein”¹⁴

Kim in combination with Li and Lee discloses or suggests or discloses or suggests this limitation. (Ex. 1002, ¶¶105-122.)

i) [5.a] “monitoring, by at least one of the first UE or the second UE, the RAR corresponding to the preamble and sent by the eNB comprises:

(a) “descrambling . . . at least one Uplink (UL) grant; and”¹⁵

As discussed above with respect to claim limitation [1.c], Kim discloses that “after transmitting the random access preamble as performed in step S401, the UE attempts to receive a random access response thereof within a random access response reception window Thereby, the UE may receive a UL grant, a temporary C-RNTI and a TAC.” (Ex. 1011, ¶[0087], FIG. 5.) Therefore, Kim discloses “receiving the RAR, the RAR comprising at least one of at least one

¹⁴ Claim 5 recites two alternatives separated by “or.” Petitioner groups these alternatives as claim limitation [5a] and [5b]. The prior art need only disclose [5a] or [5b].

¹⁵ Again, Petitioner does not repeat the claim language that is reproduced in previous grounds.

Temporary Cell Radio Network Temporary Identity (TCRNTI) or at least one Uplink (UL) grant,” as claimed.

To the extent it is argued that Kim does not expressly disclose claim [5.a], Lee discloses such a feature. (*Supra* Section IX.B.1.i.) Given that Kim, Li, and Lee disclose random access procedure between a UE and an eNodeB, a POSITA would have reason to look to Lee to improve upon the teachings of the Kim-Li combination. (Ex. 1002, ¶107.) Having looked at Lee, a POSITA would have been motivated to enable the Kim-Li UE to descramble the CRC corresponding to a PDCCH (“DCI”) according to the teachings of Lee. (*Id.*, ¶108.) Specifically, Kim discloses that the random access response is received on the PDSCH indicated by the PDCCH, which includes DCI. (Ex. 1011, ¶[0087] (referring to the RAR process of figure 4), ¶[0080].) This is the same process as described in Lee. (Ex. 1007, 12:47-62.) Lee, however, further elaborates on the same process and describes that CRC is attached to the DCI, and is scrambled. (*Supra* Section IX.B.1.i.) Thus, a POSITA would have been motivated to incorporate into the Kim-Li combination, the CRC scrambling and descrambling process described in Lee so that the UE may properly receive the random access response that is transmitted to the PDSCH according to the PDCCH information that is obtained as a result of descrambling the CRC. (Ex. 1002, ¶108.)

Importantly, as disclosed by Lee, the PDCCH has associated CRC bits that are scrambled using an identifier unique to the UE to which that PDCCH is directed. (*Id.*) This enables the correct UE to receive the PDCCH intended for it because only that UE correctly descrambles the CRC bits of the PDCCH. Thus, combining the teachings of Lee with Li would have been apparent because it would have constituted applying a known feature (Lee’s techniques) to a particular device (the Kim-Li eNB and UEs) to achieve a predictable result (enabling reception of a random access response by the UE to which the response is directed). Moreover, a POSITA would have had a reasonable expectation of success implementing such a combination. (*Id.*) For example, a POSITA knew how to implement scrambling and descrambling of DCI, and further knew how PDCCH and PUSCH operated in the context of random access. (*Id.*, ¶109.) Utilizing Lee’s techniques with the Kim-Li combination would have been well within the skills and would have merely required basic programming to configure the eNodeB and UEs to utilize Lee’s above-noted techniques.

Thus, Kim in combination with Li and Lee discloses or suggests the limitation. (Ex. 1002, ¶110.)

(b) “determining . . . in the RAR; or”

Kim discloses that the UE utilizes the UL grant resources allocated to it by the eNodeB in the RAR. (Ex. 1007, ¶[0089].) In other words, the UE determines the UL grant according to the UL grant contained in the RAR. (Ex. 1002, ¶111.)

ii) [5.b] “monitoring . . . second UE.”

This is an optional feature and need not be disclosed because [5.a] is disclosed.

2. Claim 6

Kim in combination with Li and Lee discloses or suggests this claim. (Ex. 1002, ¶¶113-114.) Kim discloses that the UE utilizes the T-CRNTI and the UL grant resources allocated to it by the eNodeB in the RAR. (Ex. 1011, ¶¶[0087]-[0089].) Thus, Kim discloses that the UE determines the T-CRNTI and the UL grant from the information in the RAR. Furthermore, as discussed above with respect to claim 5, in the Kim-Li-Lee combination, the UE detects the PDCCH to receive the RAR, and more specifically, the “UE . . . detects the PDCCH masked with RA-RNTI.” (Ex. 1007, 19:18-24.) The RA-RNTI is an “ID” of the UE because an RNTI it is a “unique identity given to a terminal.” (*Id.*, 19:33-35.) Therefore, the RAR (and its contents including the T-CRNTI and the UL grant) are determined “according to at least one of an ID of the first UE or the second UE in accordance with a pre-set rule,” as claimed. The fact that the PDCCH is masked with the RA-RNTI is a “pre-set rule.” (Ex. 1002, ¶114.)

3. Claim 8

Kim in combination with Li and Lee discloses or suggests or discloses or suggests this limitation. (Ex. 1002, ¶¶115-118.) As discussed above, Kim’s UE (“the first UE” in the Kim-Li combination) receives a message 4 sent by the eNB. (Ex. 1011, ¶¶[0091]-[0092], FIG. 5.) Kim further notes that, for receiving message 4 from the eNB, “the UE may attempt to receive a PDCCH using the temporary C-RNTI included in the random access response.” (*Id.*, ¶[0092].) To a POSITA, this simply means that the CRC for the PDCCH (which is “DCI”) is scrambled by the eNB and the UE descrambles this CRC using the temporary C-RNTI (T-CRNTI). (Ex. 1002, ¶115.)

To the extent it is argued that such a feature is not apparent from Kim, Lee discloses that a message 4 pertaining to contention resolution is transmitted by the eNodeB to the UE after receiving message 3. (Ex. 1007, 21:47-22:15.) And transmission of message 4 involves the transmission of a PDCCH by the eNodeB, which the UE attempts to receive “using the TC-RNTI” of the UE. (*Id.*) As discussed above with respect to claim 5 in Section IX.B.1, a POSITA would have understood that “using the TC-RNTI” simply refers to the fact that the CRC bits of the PDCCH are scrambled by the eNodeB using the “TC-RNTI,” which the UE then uses to descramble the CRC bits and receive the PDCCH. That is, Lee discloses

“scrambling a CRC of DCI for scheduling the message 4 by using a TC-RNTI allocated to at least one of the first UE or the second UE.”

A POSITA would have been motivated to combine the Kim-Li combination with Lee’s teachings of scrambling a CRC of DCI for scheduling the message 4 by using a TC-RNTI allocated to the first UE, in view of Lee’s similarity to both Kim and Li. (Section IX.F.1.i, *supra* (explaining similarities between Kim, Li and Lee).) (Ex. 1002, ¶117.) Having looked at Lee, a POSITA would have been motivated to enable the Kim-Li combination eNodeB to scramble a CRC of DCI for scheduling the message 4 according to the teachings of Lee. (*Id.*) Specifically, by scrambling the CRC, the eNodeB can “resolve contention” with the “relevant UE” that has not been assigned a C-RNTI. (Ex. 1007, 21:48-22:15.) As explained above with respect to claim 5, adding CRC bits to a PDCCH and scrambling them allows the PDCCH to be received by the intended UE and a POSITA would have been able to make the relevant changes to Kim-Li system to implement such a modification. (*Id.*)

4. Claim 9

Kim in combination with Li and Lee discloses or suggests this claim. (Ex. 1002, ¶¶119-120.) To the extent it is argued that Kim does not expressly disclose that the message 4 “comprises a set of radio resources allocated to the first UE or second UE,” both Lee and Li disclose allocating a set of radio resources to enable the UE to transition to an RRC connected state. (*See supra* Section IX.B.4.) For

example, Lee discloses that “the RRC connection setup message [i.e., message 4] includes configuration information for setting SRB1” and “by transmitting the RRC connection setup message to the terminal” (the UE), the “BS” (eNB) “allocates SRB (e.g., SRB 1) configuration resource to be dedicatedly used by the terminal.” (Ex. 1007, 14:63-67.)

A POSITA would have been motivated to modify the Kim-Li-Lee combination, with a reasonable expectation of success, to include such radio resources in Kim’s message 4 so as to allow the UE to transition to an RRC connected state. (*See supra* Section IX.B.4.)

5. **Claim 10: “The method according to claim 9, wherein the radio resources allocated to at least one of the first UE or the second UE are further determined by at least one of the first UE or the second UE according to an ID of at least one of the first UE or the second UE in accordance with a pre-set rule.”**

Kim in combination with Li and Lee discloses or suggests this claim. (Ex. 1002, ¶121.) For example, as discussed above with respect to claim 9, in the Kim-Li-Lee combination, the UE receives radio resources allocated thereto by the eNodeB. (*Supra* Section IX.F.4.) Furthermore, in the Kim-Li-Lee combination, the message 4 is deciphered by the UE using a TC-RNTI of the UE. (*Supra* Section IX.F.3.) Because message 4 includes the radio resources (*supra* Section IX.F.4) in the Kim-Li-Lee combination, the radio resources in the message 4 are determined by the UE in accordance with an ID thereof (i.e., the TC-RNTI) according to a pre-

set rule (which is that the UE with the correct TC-RNTI is able to descramble and decode the PDCCH corresponding to message 4). Therefore, the Kim-Li-Lee combination disclose or suggests claim 10.

G. Ground 7: Claim 12 Is Obvious over Kim in view of Li and Zhao

Kim in view of Li and Zhao discloses or suggests claim 12. (Ex. 1002, ¶¶122-124.) As discussed above with respect to claim 7, Kim discloses that the UE receives a message 4 after sending message 3. (Ex. 1011, ¶¶[0091]-[0092], FIG. 5.) Kim does not, however, explicitly disclose what happens if a message 4 is not received from the eNodeB. (Ex. 1002, ¶122.) For example, Kim does not explicitly disclose what happens if the eNodeB does not properly receive message 3 from the UE. (*Id.*) Zhao, however, discloses a random access procedure just like Kim's but in which the eNodeB orders the UE to restart the random access procedure by resending a preamble. Zhao discloses claim 12. (*Supra* Section IX.C.)

Given that Zhao also discloses a random access procedure for LTE like Kim, a POSITA would have reason to look to Zhao to fill in the gaps in Kim's disclosure. (Ex. 1002, ¶123.) Having looked to Zhao, a POSITA would have been motivated to modify the Kim-Li combination's random access procedure to incorporate Zhao's teachings regarding the eNodeB's instruction/command to the UE to restart random access procedure when, for example, message 3 is not successfully received or processed by the eNodeB. (*Id.*) Incorporating such a technique in the Kim-Li

combination would have provided the benefit of enabling the UE “to synchronize with the network” in the event of the eNodeB not receiving or failing to process message 3. (*Id.*) A POSITA would have had a reasonable expectation of success in performing this modification of the Kim-Li combination in view of Zhao given such a person’s skill and the teachings of Zhao. (*Id.*)

H. Ground 8: Claim 17 Is Obvious over Kim in view of Li and Jiang

Kim in combination with Li and Jiang discloses or suggests claim 17. (Ex. 1002, ¶¶125-127.) Kim does not explicitly disclose what happens if a random access response is not received by the UE after sending a random access preamble to the eNodeB. (Ex. 1002, ¶125.) That is Kim does not explicitly disclose what, if any, steps the UE may take to continue the process of establishing a connection with the eNodeB if a response to the preamble sent by the UE is not received. (*Id.*) Jiang, however, discloses a similar setup as Kim and in particular, explains that if a response is not received from the network side (i.e., from the eNodeB) within “a given time,” then the MTC terminal “can repeatedly send the Preamble.” (Ex. 1006, ¶[0044].)

Like the Kim-Li combination, Jiang also discloses a random access procedure for UEs belonging to a group. (*See id.*, ¶¶[0036]-[0038].) Like Kim and Li, Jiang discloses a random access process involving message 1 (sending of the random access preamble to the base station/eNB by the MTC UE), message 2 (random access

response from the base station), message 3 (RRC connection request), and a message 4. (*Id.*, ¶¶[0039]-[0056].) Thus, a POSITA would have reason to look to Jiang to improve upon or fill in gaps in the disclosure of Kim. (Ex. 1002, ¶126.) Having looked to Jiang, a POSITA would have been motivated to combine the teachings of Kim, Li and Jiang to incorporate in the Kim-Li combination, Jiang’s feature of repeatedly sending the Preamble if a random access response is not received from the eNodeB within a predetermined time interval. (*Id.*) Doing so would have allowed the UE to continue to request a connection within the eNodeB in the absence of a response to the transmitted preamble within a given time window. (*Id.*) A POSITA would have had a reasonable expectation of success in performing this modification of Kim and Li in view of Jiang given such a person’s skill and the teachings of Jiang. (*Id.*)

I. Ground 9: Claim 18 Is Anticipated by Kim

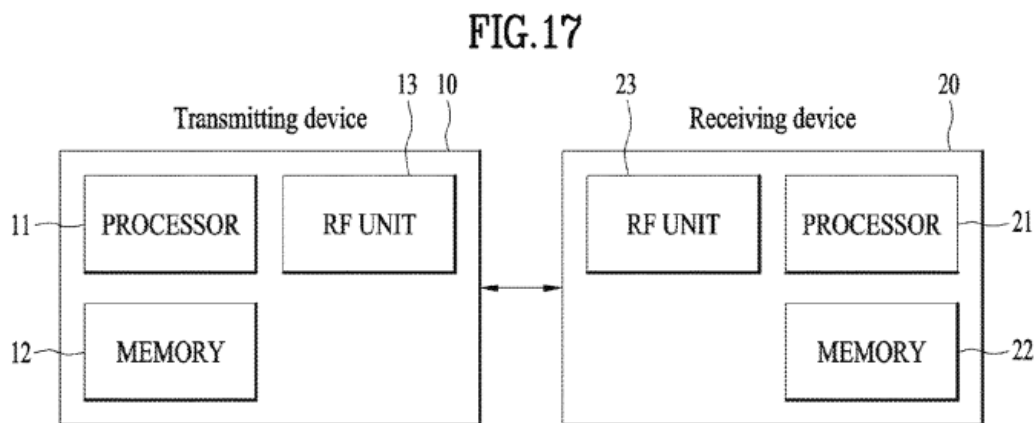
1. Claim 18:

i) [18.pre] “A User Equipment (UE), comprising:”

To the extent this preamble is limiting, Kim discloses the limitations therein. (Ex. 1002, ¶128.) “FIG. 17 is a block diagram illustrating elements of a transmitting device **10** and a receiving device **20** for implementing the present invention.” (Ex. 1011, ¶[0234].) “In the embodiments of the present invention, a UE operates as the

transmitting device 10 in UL and as the receiving device 20 in DL.” (*Id.*, ¶[0241].)

UL refers to uplink and DL refers to downlink. (Ex. 1002, ¶128.)



(*Id.*, FIG. 17.)

ii) [18.a]: “a sending unit, and a monitoring unit,”¹⁶

Kim discloses this limitation. (Ex. 1002, ¶129.) Based on Figure 17, Kim’s UE includes a processor and an RF unit that together perform the various functions of the UE. (Ex. 1011, ¶¶[0235]-[0239].) For example, the processor and RF unit

¹⁶ Arguably, the terms “sending unit” and “monitoring unit” invoke §112(f) as being nonce terms and there is no corresponding structure (e.g., an algorithm) disclosed in the ’430 patent. To the extent Patent Owner contends that an algorithm is disclosed, which includes the steps set forth below in the remaining limitation of claim 18, the prior art’s disclosure, discussed below, is commensurate with the extent to which any such algorithm is disclosed in the ’430 patent.

work in conjunction to transmit msg1, receive msg2, and transmit msg 3. (*Id.*, ¶[0242].) Thus, the processor and RF unit combine to form both a sending unit and a monitoring unit.

- iii) **[18.b] “wherein the sending unit is configured to : send a preamble to an evolved Node B (eNB) over a time-frequency resource , the time-frequency resource comprising a time domain resource and a frequency domain resource,”**

Kim discloses this limitation. (Ex. 1002, ¶130.) Kim in combination with Li discloses or suggests that the UE sends a preamble to an eNB over a time-frequency resource. (*Supra* Section IX.E.1.ii-iii.) A POSITA would have further understood that disclosure of Figure 17 would have been applicable to the above-identified function of sending a preamble over a time-frequency resource. For example, the UE must have some hardware and software that is configured to carry out the recited functions (e.g., sending a preamble). And Figure 17 discloses such hardware while noting that the processor and RF unit work in conjunction to transmit msg1 (Ex 1011, ¶[0242]), which in the case of Kim is the sending of the preamble to the eNB. (*Supra* Section IX.E.1.ii-iii.)

- iv) **[18.c] “the monitoring unit is configured to : monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB ;”**

Kim discloses this limitation. (Ex. 1002, ¶131.) Kim in combination with Li discloses or suggests that the UE monitors an RAR. (*Supra* Section IX.E.1.iv.) A

POSITA would have further understood that disclosure of Figure 17 would have been applicable to the above-identified function of the UE. The UE must have some hardware and software that are configured to carry out the recited functions (e.g., sending a preamble). And Figure 17 discloses such hardware while noting that the processor and RF unit work in conjunction to receive msg 2 (Ex 1011, ¶[0242]), which in the case of Kim is the receiving of the RAR from the eNB (*supra* Section IX.E.1.iv.).

- v) **[18.d] “the sending unit is further configured to : send a message 3 according to a Uplink (UL) grant allocated to the UE,”**

Kim discloses this limitation. (Ex. 1002, ¶132.) Kim discloses that the UE sends a message 3. (*Supra* Section IX.E.1.vi.) A POSITA would have further understood that disclosure of Figure 17 would have been applicable to the above-identified function of the UE in the Kim-Li combination. (Ex. 1002, ¶109.)

- vi) **[18.e] “wherein the message 3 comprises a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre – set UE number.”**

Kim discloses this limitation. (Ex. 1002, ¶133.) Kim discloses that the message 3 includes a pre-set UE number. (*Supra* Section IX.E.1.vii.)

X. DISCRETIONARY DENIAL UNDER FINTIV IS NOT APPROPRIATE

Petitioner respectfully submits that the unpatentability challenge presented in this petition is compelling. As demonstrated above, the merits of Petitioner's arguments are strong and the evidence in support of them is substantial, and, if the Board agrees, “that determination alone demonstrates that the PTAB should not discretionarily deny institution under *Fintiv*.” (Ex. 1008 (Memorandum from Director Vidal dated June 21, 2022), 4-5.) Even if the Board necessitates the *Fintiv* analysis, as explained below, the six *Fintiv* factors do not justify denying institution. 35 U.S.C. § 314(a); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential).

The **first factor** (stay) is neutral because Samsung has not yet moved to stay the district court proceedings pending IPR, and the PTAB will not infer how the district court would rule should a stay be requested. *See Hulu LLC v. SITO Mobile R&D IP, LLC et al.*, IPR2021-00298, Paper 11 at 10-11 (P.T.A.B. May 19, 2021).

The **second factor** (proximity of trial dates) weighs strongly against denial. “The PTAB will weigh this factor against exercising discretion to deny institution under *Fintiv* if the median time-to-trial is around the same time or after the projected statutory deadline for the PTAB’s final written decision.” (Ex. 1008, 9.) The median time from filing to trial in the Eastern District of Texas is more than 24 months. (Ex. 1009 (Federal Court Management Statistics), 35.) On the other hand, with this

petition filed in January 2023, a final written decision may be expected within 18 months, i.e., by August 2024. Thus, the final decision is expected close to the trial date. However, even if the final decision deadline falls after the trial date, such timing should not be dispositive. The Board has previously granted institution in cases in which such deadline was months after the scheduled trial date. The Board has relied on various justifications, such as diligence in filing the petition, a stipulation not to pursue the asserted grounds in litigation, minimal investment in litigation, and the merits of the invalidity challenge were strong. *Verizon Business Network Services, Inc. v. Huawei Techs. Co.*, IPR2020-01141, Paper 12 (Jan. 14, 2021). The same factors are present in this case. For instance, Petitioner has exercised diligence and filed this petition well in advance of the one-year bar date. Fact discovery is not anticipated to close until June 2023. Expert discovery has not yet started. The Markman hearing has been scheduled for May 24, 2023, almost six months after the filing of this petition.

The **third factor** (investment in parallel proceedings) also weighs strongly against denial. The district court case is in the early stages. Fact discovery has just begun, and the parties have not taken any depositions, or engaged in expert discovery. (Ex. 1010, 1-5.) Nor have there been any substantive orders in this case.

The **fourth factor** (overlap) also weighs against denial. Petitioner hereby stipulates that, if the IPR is instituted, Petitioner will not pursue the IPR grounds in

the district court litigation. *See Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 12 (P.T.A.B. June 16, 2020).

The **sixth factor** (other circumstances) also weighs against denial as the merits of Petitioner’s arguments are strong. While the **fifth factor** (parties) may weigh slightly in favor of denial because the Petitioner and Patent Owner are the same parties as in district court, under the “holistic view” of whether integrity of the system and efficiency is best served, the factors here indicate that institution is proper. *Samsung Elecs. Co. Ltd. v. Dynamics Inc.*, IPR2020-00505, Paper 11 at 15 (P.T.A.B. Aug. 12, 2020).

XI. CONCLUSION

Petitioner requests institution of IPR for claims 1-15, 17, and 18 of the ’430 patent based on the grounds specified in this petition.

Respectfully submitted,

Dated: January 5, 2023

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,448,430 contains, as measured by the word-processing system used to prepare this paper, 13,788 words. This word count does not include the items excluded by 37 C.F.R. § 42.24 as not counting towards the word limit.

Respectfully submitted,

Dated: January 5, 2023

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner

CERTIFICATE OF SERVICE

I hereby certify that on January 5, 2023, I caused a true and correct copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,448,430 and supporting exhibits to be served via express mail on the Patent Owner at the following correspondence address of record as listed on USPTO Patent Center:

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By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)