

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,

v.

G+ COMMUNICATIONS, LLC,
Patent Owner.

IPR2023-00441
Patent 10,448,430 B2

Before GREGG I. ANDERSON, SCOTT B. HOWARD, and
JASON M. REPKO, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Samsung Electronics Co. Ltd., (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–15 and 17–18 of U.S. Patent No. 10,448,430 B2 (Ex. 1001, “the ’430 patent”). Paper 1 (“Pet.”). We instituted *inter partes* review on August 3, 2023. Paper 10 (“Inst. Dec.”). G+ Communications, LLC (“Patent Owner”) filed a Response. Paper 12 (“PO Resp.”). Petitioner filed a Reply. Paper 15 (“Pet. Reply”). Patent Owner filed a Sur-reply. Paper 19 (“Sur-reply”). A hearing was held on May 6, 2024, and a transcript has been made of record. Paper 23 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. Upon considering the record, for the reasons discussed below, we find Petitioner has not shown by a preponderance of the evidence that claims 1–15 and 17–18 are unpatentable.

II. BACKGROUND

A. *Real Parties in Interest*

Petitioner states it and Samsung Electronics America, Inc. are the real parties in interest. Pet. 1. Patent Owner asserts it is the real party in interest. Paper 4 (“G+ Communications LLC’s Mandatory Notices), 1.

B. *Related Matters*

Both parties list a lawsuit filed by Patent Owner asserting the ’430 patent against Petitioner in the Eastern District of Texas captioned *G+ Communications, LLC v. Samsung Electronics Co.*, Case No. 2:22-cv-00078-JRG (E.D. Tex.) (“District Court lawsuit”). Pet. 1; Paper 4, 1. Two related *inter partes* review proceeding between the same parties have been filed, both styled *Samsung Electronics Co., Ltd. v. G+ Communications LLC*, respectively IPR2022-01598 (“’1598 IPR”) and IPR2023-00171 (“’171 IPR”). See ’1598 IPR, Paper 38 (final written judgment determining

no challenged claims unpatentable); '171 IPR, Paper 34 (final written judgment determining all challenged claims unpatentable).

C. The '430 Patent

The application for the '430 patent was filed as national stage application No. 15/738,233 on May 13, 2016, from PCT/CN2016/082087 filed on December 20, 2017. Ex. 1001, codes (21, 22, 86). The PCT application claims priority to Chinese application 2015 1 0368321 (“'321 application”), filed June 26, 2015. *Id.* at code (30).

1. Background Technology

“A Machine Type Communication (MTC) User Equipment (UE or terminal) is also referred to as a Machine to Machine (M2M) user communication device, which is a main application form of a current internet of things.” Ex. 1001, 1:11–15. The '431 patent relates to Long-Term Evolution (LTE)/Long-Term Evolution Advance (LTE-Advance or LTE-A) which are broadband wireless communication systems. *Id.* at 1:16–20. “In the LTE system, a random access is a basic function, and a UE can be scheduled by the system to perform uplink transmission only after uplink synchronization with the system via a random access process.” *Id.* at 1:22–25.

In a contention based random access process a UE randomly selects and then sends an available preamble to an evolved Node B or eNB (an evolved base station). Ex. 1001, 1:28–31. When the eNB detects a preamble sequence sent by the UE, the eNB sends a Random Access Response (RAR). *Id.* at 1:32–34. “[A] response will be sent over a Downlink-Synchronization Channel (DL-SCH), the response including: an index number of the detected preamble, time adjustment information for uplink synchronization, initial uplink resource allocation (used for sending a

subsequent message).” *Id.* at 1:34–40. The index number includes a Temporary Cell Radio Network Temporary Identity (TC-RNTI). *Id.* at 40–41. Contention resolution occurs when it is “decided whether the TC-RNTI is converted into a permanent C-RNTI.” *Id.* at 1:41–44.

In the contested random access process, the “UE needs to monitor an RAR message over a Physical Downlink Control Channel (PDCCH) by using a Random Access RNTI (RA-RNTI),” which is determined according to the following formula: $RA-RNTI = 1 + t_id + 10 * f_id$. Ex. 1001, 1:42–46. The t_id term “refers to an index number of a first subframe of a Physical Random Access Channel (PRACH) for sending a preamble ($0 \leq t_id < 10$).” *Id.* at 1:46–50. Similarly, f_id is a PRACH index for a frequency domain position index. *Id.* at 1:51–53.

In the contention-based random access process, “it cannot be determined that the RAR message is sent to the UE itself instead of other UEs.” Ex. 1001, 1:55–59. The UE “is unable to know whether other UEs make a random access by using the same resource” and thus “needs to resolve such a random access contention via the subsequent message 3 and message 4.” *Id.* at 1:63–67. Message 4 is a contention resolution message indicating a UE identified in message 3’s UE Identifier “wins this random access contention” and is successful. *Id.* at 2:1–11.

In “contention-free random access” the preamble sent by the UE uplink synchronization is completed after the time adjustment information is sent by the eNB over the DL-SCH. Ex. 1001, 2:12–14. A contention resolution process is not executed. *Id.* at 2:14–15.

Future communications demands will require “tens of thousands” of UEs to meet demand. Ex. 1001, 2:16–21. Even if the UEs are uniformly accessed, which is not the case, “at least hundreds of times of PRACH

resources are needed in accordance with a random access mode in the related art.” *Id.* at 2:21–26.

2. The “random access” method of the ’430 patent

The ’430 patent describes and claims a random access method where “[a] first UE in a UE group sends a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource.” Ex. 1001, 2:44–47.

Figure 1 of the ’430 patent is reproduced below.

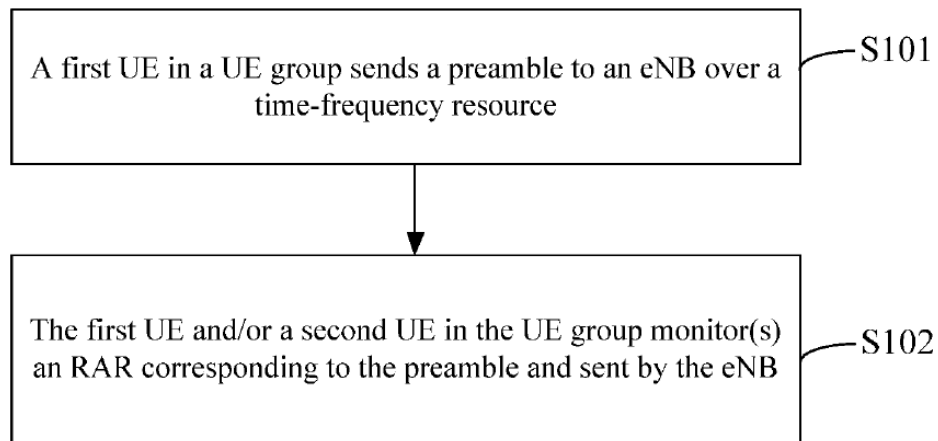


FIG. 1

Figure 1 is a flowchart of a random access method according to one embodiment.

Ex. 1001, 8:66–67. Referring to Figure 1, the method is applied to a UE side at step S101 “a first UE in a UE group sends a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource.” *Id.* at 9:29–32. At step S102 “the first UE and/or a second UE in the UE group monitor(s) an RAR corresponding to the preamble and sent by the eNB.” *Id.* at 9:33–35.

Herein, the first UE may be at least one UE in the UE group, and the first UE can be representative of the UE group. The second UE may be all or some UEs in the UE group, i.e., UEs having random access requests.

Therefore, the second UE may include the first UE.

It is important to note that the first UE may be 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.

Moreover, the preamble and/or the time domain resource and/or the frequency domain resource may be pre-set, or may be determined by a group ID of the UE group, or may be notified by the eNB.

Ex. 1001, 9:37–50.

Figure 2 of the '430 patent is reproduced below.

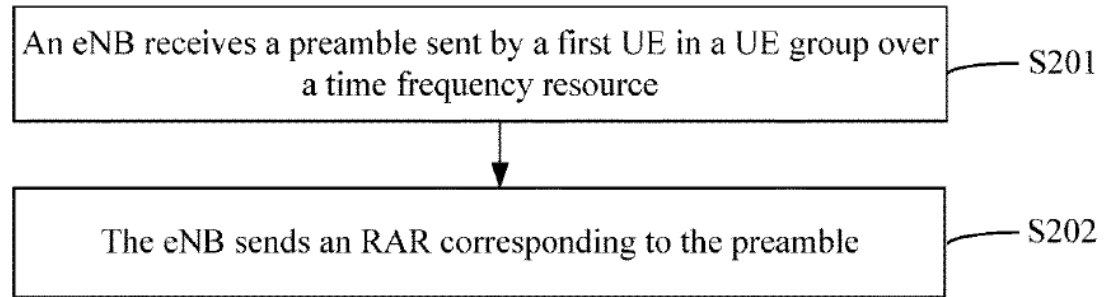


FIG. 2

Figure 2 is a flowchart of a random access method according to another embodiment.

Ex. 1001, 9:1–2. Referring to Figure 2, the method is applied to the eNB side at step S201, “an eNB receives a preamble sent by a first UE in a UE group over a time-frequency resource, herein the time-frequency resource includes a time domain resource and a frequency domain resource.” *Id.* at 11:41–47. At step S202, the eNB sends an RAR corresponding to the preamble. *Id.* at 11:48–49. The UE then responds to the RAR by sending a message 3 identifying itself with a unique ID. *Id.* at 12:1–6. The eNB then sends back a confirmation message 4. *Id.* at 12:21–33.

D. Illustrative Claim

Claims 1–15 and 17–18 of the ’430 patent are challenged. Pet. 1, 2–3. Claims 1 and 18 are independent and claim a method and a “User Equipment” respectively. Claims 2–15 and 17 depend directly or indirectly from claim 1. Claim 1 is illustrative and is reproduced below.

[1.pre]¹ A random access method, comprising:

[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,

[1.b] the time-frequency resource comprising a time domain resource and a frequency domain resource;

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

[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; and

[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,

[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.

Ex. 1001, 30:10–30.

E. Evidence of Record

This proceeding relies on the following prior art references and expert testimony:

Li, US 2013/0155894 A1, published June 20, 2013 (Ex. 1005, “Li”);

¹ Petitioner uses the claim number followed by “pre” for preamble or letters for the limitations. *See, e.g.,* Pet. 9 (1.pre). We adopt this format for this Decision.

Lee, U.S. Patent No. 10,034,308 B2, issued July 24, 2018 (Ex. 1007, “Lee”);

Zhao, US 2014/0362794 A1, published December 11, 2014 (Ex. 1012, “Zhao”);

Jiang, CN 102917433 A, published February 6, 2013 (Ex. 1006, “Jiang”);

Kim, US 2016/0374068 A1, published December 22, 2016 (Ex. 1011, “Kim”); and

Petitioner relies on the Declaration of Dr. Zhi Ding in Support of Petition for Inter Partes Review of U.S. Patent No. 10,448,430 (Ex. 1002, “Ding Declaration”) and the Rebuttal Declaration of Dr. Zhi Ding (Ex. 1014, “Ding Rebuttal Declaration”).

F. Asserted Grounds

Claim(s) Challenged	35 U.S.C.² §	Reference(s)/Basis
13, 7, 11, 13–15, 18	102	Li
5–6, 8–10	103	Li, Lee
12	103	Li, Zhao
17	103	Li, Jiang
1–4, 7, 13	103	Kim, Li
5–6, 8–10	103	Kim, Li, Lee
12	103	Kim, Li, Zhao

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-129, 125 Stat. 284, 285–288 (2011), revised 35 U.S.C. §§ 102 and 103 effective March 16, 2013. Because the challenged patent was filed after March 16, 2013, we refer to the current version of these statutes. The findings and analysis in this Decision would be the same under the pre-AIA versions.

Claim(s) Challenged	35 U.S.C. ² §	Reference(s)/Basis
17	103	Kim, Li, Jiang
18	102	Kim

III. PATENTABILITY ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner proposes that a person of ordinary skill in the art for the invention of the '430 patent “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. More education can supplement practical experience and vice versa.” Pet. 6–7 (citing Ex. 1002 ¶¶ 23–24). Patent Owner does not propose a level of ordinary skill. *See* PO Resp.

Petitioner’s proposal is supported by the testimony of Dr. Ding and is consistent with the '430 patent. Accordingly, we apply Petitioner’s articulation.

B. Claim Construction

In an *inter partes* review, a claim shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100 (2022); *see also Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

1. “pre-set UE number” (claims 1 and 18)

The complete limitation in question recites “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.” Ex. 1001, 30:27–30 (claim 1), 32:53–56 (claim 18) (emphasis added). In the Institution Decision, we preliminarily construed the term “pre-set UE number” to mean “one UE identified by a number.” Inst. Dec. 23.

After the Institution Decision, the District Court addressed whether “pre-set UE number” was “a quantity, an identifier, or something else.” Ex. 2008, 21 (District Court Claim Construction Memorandum and Order). In that proceeding, Petitioner argued that “‘pre-set UE number’ is not an identifier.” Ex. 2006, 12 (Petitioner’s Responsive Claim Construction Br.)

Based on the language of the claims and the specification, the District Court agreed with Petitioner that “pre-set UE number” did not include an identifier and, instead, held that “pre-set UE number” means a “quantity.” Ex. 2008, 21. The District Court listed three reasons for its construction as follows:

First, the surrounding claim language pertains to other quantities, and a skilled artisan would consider the meaning of the term considering that language. Second, given the nature of the invention as a whole—“group based random access method device and system”—quantities of UEs are important. Third, when the patent refers to an identifier, it does so with “identifier” or “ID.”

Id.

We adopt the District Court’s construction as our final construction of “pre-set UE number.” The final construction is dispositive of this challenge to patentability because the prior art references do not show the “pre-set UE number” under the final construction. As a result, Petitioner has not shown

that any claim of the '430 patent is unpatentable. Our reasons for this determination follow.

Petitioner “takes no position in this IPR as to the correctness of the district court’s construction” of “pre-set UE number.” Pet. Reply 1–2; Tr. 9 (“[W]e were very clear in our papers, hopefully we were clear in our papers. We take no position on the District Court’s claim construction.”), 19 (“[Petitioner] takes no position on the District Court’s construction, so I have no reason to give you as to why that construction is wrong or right.”).

Patent Owner proposes that we construe the term “pre-set UE number” (“UE term”) as the term was construed by the District Court after trial was instituted here. PO Resp. 19–22 (citing Ex. 2008, 21). Patent Owner further argues that the fact that Petitioner “takes no position on the proper interpretation of the UE term” means that Petitioner “failed to meet its burden of proof of unpatentability of any claim.” Sur-reply 2–3.

We are not persuaded to maintain our preliminary construction. Indeed, as already noted, Petitioner does not argue for the preliminary construction. Neither does Petitioner question the validity of the reasons given for the District Court’s construction. Rather, Petitioner repeats its position that it “takes no position on the District Court’s construction” and Petitioner does not have any reason “as to why that construction is wrong or right.” Tr. 18:24–19:6.

We do not see any reason to construe “pre-set UE number” contrary to what the District Court has determined. Indeed, we find the District Court’s analysis of the issue highly persuasive and adopt it as our own. And Petitioner has not provided any argument regarding construction of the term, simply taking no position on its correctness.

2. “*sending unit*” and “*monitoring unit*” terms of claim 18

Patent Owner argues that both parties in the District Court lawsuit agreed that certain terms, particularly “sending unit” and “monitoring unit” recited in claim 18, are means-plus-function terms under 35 U.S.C. § 112(f). PO Resp. 22. This determination was made per agreement of the parties in the District Court lawsuit. Ex. 2008, 22. In this proceeding, Petitioner agreed “that the terms any unit should be construed as a means-plus-function element.” Tr. 11:19–23.

Petitioner argues that we cannot render a decision on the merits “because the scope of claim 18 cannot be determined with reasonable certainty.” Pet. Reply 2, 10. Specifically, Petitioner alleges that if the “sending unit” and “monitoring unit” term of claim 18 are means-plus-function terms, the corresponding structure cannot be identified in the specification. *Id.* at 2.

Patent Owner argues that this argument was not presented in the Petition and is too late and/or incorrect. Sur-reply 5. We agree with Patent Owner. Neither Patent Owner nor the Board were given any notice of this argument in the Petition. Regardless, we find no merit in Petitioner’s argument.

Fundamentally, our jurisdiction regarding patentability is limited to Sections 102 and 103 of the Patent Act. 35 U.S.C. § 311(b). We do not find that claim 18 is so indefinite that a patentability determination is impossible. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 802, 812–813 (Fed. Circ. 2021) (claim construction obligation “does not mean that the Board must reach a determination of the patentability of a claim on the presented prior-art grounds if such a determination is rendered impossible because of the indefiniteness of an essential claim limitation.”). Indeed, the District Court

determined that the corresponding structure is a processor programmed to either

(1) descramble a Cyclic Redundancy Check (CRC) of Downlink Control Information (DCI) for scheduling the RAR according to a pre-set RA-RNTI or an RA-RNTI corresponding to the preamble, and receive the RAR, the RAR including at least one TCRNTI and/or at least one Uplink (UL) grant.

Ex. 2008, 23 (quoting Ex. 1001, 2:66–3:4).

(2) determine corresponding RA-RNTIs according to respective IDs and/or preambles, descramble a CRC of DCI for scheduling the RAR according to the corresponding RA-RNTIs, and receive corresponding RARs, the RAR including a TCRNTI and/or a UL grant allocated to the first UE or second UE.

Id. (quoting Ex. 1001, 3:23–28).

Petitioner has forfeited the indefiniteness argument.

Regardless, we are given no reason to find construction of the two means-plus function terms impossible given the District Court determination.

We agree that the scope of the terms is based on a means-plus function analysis. We are not persuaded that structure is not sufficiently described.

C. Legal Standard for Anticipation

In order for a prior art reference to serve as an anticipatory reference, it must disclose every limitation of the claimed invention, either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). We must analyze prior art references as a skilled artisan would. *See Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991), *overruled on other grounds by Abbott Labs. v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009) (to anticipate, “[t]here must be no difference between the

claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention”). As the Federal Circuit has held:

This modest flexibility in the rule that “anticipation” requires that every element of the claims appear in a single reference accommodates situations where the common knowledge of technologists is not recorded in the reference; that is, where technological facts are known to those in the field of the invention, albeit not known to judges. It is not, however, a substitute for determination of patentability in terms of § 103.

Cont’l Can Co. USA v. Monsanto Co., 948 F.2d 1264, 1268–69 (Fed. Cir. 1991). A claim limitation is inherent if it is necessarily present in the prior art, not merely probably or possibly present. *Akamai Techs., Inc. v. Cable & Wireless*, 344 F.3d 1186, 1192 (Fed. Cir. 2003).

D. Legal Standard for Obviousness

A patent claim is invalid as obvious if the differences between the claimed subject matter and the prior art are “such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a).

The ultimate determination of obviousness is a question of law, but that determination is based on underlying factual findings. . . . The underlying factual findings include (1) “the scope and content of the prior art,” (2) “differences between the prior art and the claims at issue,” (3) “the level of ordinary skill in the pertinent art,” and (4) the presence of secondary considerations of nonobviousness such “as commercial success, long felt but unsolved needs, failure of others,” and unexpected results.

In re NuVasive, Inc., 842 F.3d 1376, 1381 (Fed. Cir. 2016) (citing *inter alia* *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966)).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Furthermore, in assessing the prior art, the Board must consider whether a person of ordinary skill would have been motivated to combine the prior art to achieve the claimed invention. *In re NuVasive*, 842 F.3d at 1381.

As the Federal Circuit found, in quoting from the Supreme Court’s decision in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418–419 (2007),

“because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known,” “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.”

Personal Web Techs., LLC v. Apple, Inc., 848 F.3d 987, 991–92 (Fed. Cir. 2017).

E. Claims 1–3, 7, 11, 13–15, and 18 as Anticipated by Li

Petitioner alleges that claims 1–3, 7, 11, 13–15, and 18 would have been anticipated by Li. Pet. 9–23. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 39–60.

1. Li (Ex. 1005)

In Li,

terminals in a same group execute random number synchronization; when an arbitrary first terminal in the group initiates network access, terminals in the group except the first terminal monitor the access of the first terminal according to the

synchronized random number, after monitoring that the first terminal accesses network successfully, the terminals in the group except the first terminal initiate network access by using Radio Resource Control (RRC) connection uplink resources which are allocated to the group by the network.

Ex. 1005, code (57). Li states that “[t]he technical solution of the present invention can reduce the signaling overhead for establishing signaling connection and data bearing.” *Id.*

Li’s Figure 6 is reproduced below.

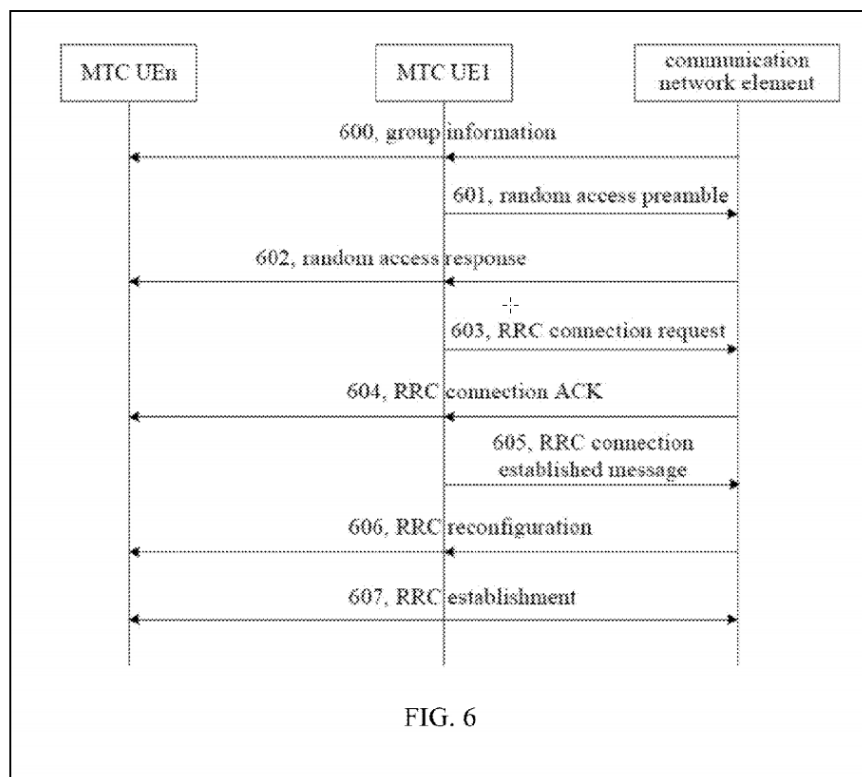


FIG. 6

Figure 6 is a schematic flowchart of a network access method according to another embodiment.

Ex. 1005 ¶ 106. Referring to Figure 6, at 600 group information is sent to all terminals in a group over a communications network. *Id.* ¶ 107. The communication network element may divide a plurality of terminals into one or more groups and then broadcast group information including terminal IDs

of all terminals in each group, so that each terminal can calculate a group ID of the group it belongs to according to terminal IDs of all terminals in the group. *Id.* ¶¶ 110–111. The communication network element may also broadcast 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.* ¶¶ 112–114.

2. Independent Claims 1 and 18

Both independent claims 1 and 18 recite in part “pre-set UE number.” Ex. 1001, 30:30 (claim 1), 32:55–56 (claim 18). For the “pre-set UE number” of limitation 1.f and 18.e limitations at issue here, Petitioner relies on Li’s teaching that the RRC connection request (message 3) includes “the terminal ID of MTC UE1.” Pet. 16 (citing Ex. 1005 ¶ 128) (claim 1), 62 (citing same disclosures from Li) (claim 18). In addition, Li teaches the “terminal ID may be IMSI, MSISDN, IP address, IMPU, IMPI and any other symbol used to uniquely identify a terminal.” *Id.* at 16 (citing Ex. 1005 ¶ 66), 62 (citing same disclosure from Li). Petitioner’s showings rely on our preliminary claim construction of “pre-set UE number,” which has not been adopted as our final construction, and Petitioner has elected not to dispute the correctness of the construction. *See* Pet. Reply 2.

Our construction of “pre-set UE number” is dispositive of this proceeding. *See* Section III.B.1 above. Petitioner agrees that both Li and Kim “don’t disclose that the message 3 includes a ‘pre-set number of UEs’” under our final construction of “pre-set UE number.” Pet. Reply 4; *see also* Tr. 7:20–22 (“Under [the District Court] construction, Li and Kim would not disclose Claim 1, at least Claim 1, of the ’430 patent”); 11:3–17 (Petitioner’s counsel arguing claim 18 is indefinite but agreeing neither claim 1 nor 18

have been shown unpatentable under the District Court construction of “pre-set UE number”).

For the reasons set forth above, Petitioner has not shown a by a preponderance of the evidence that claims 1 and 18 are anticipated by Li.

3. Claims 2–3, 7, 11, 13–15

Having already decided that claim 1 is not anticipated by Li, Petitioner has not shown by a preponderance of the evidence that claims 2–3, 7, 11, and 13–15, which depend directly or indirectly on claim 1, were anticipated by Li.

4. Conclusion

Petitioner has not shown by a preponderance of the evidence that that claims 1–3, 7, 11, 13–15, and 18 would have been anticipated by Li.

F. Obviousness of Claims 5, 6, 8–10 over Li and Lee

Petitioner alleges claims 5, 6, and 8–10 would have been obvious over Li and Lee. Pet. 24–35. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 61–80.

1. Li (Ex. 1005)

Li was described in Section III.E.1 above.

2. Lee (Ex. 1007)

Lee is a contention-based random access procedure between a UE and an eNB. Ex. 1007, 10:26–41, 18:32–23:23. Lee describes a random access procedure which includes four transmission and reception steps: transmission by first message (Msg1); receipt of a random access response at second message (Msg2); transmission of an uplink message using information from the random access response (RAR) as a third message (Msg3); and a fourth message (Msg4). *Id.* at 14:30–53. “The RRC [radio

resource control] connection setup message may correspond to a fourth message (message 4) of the random access procedure.” *Id.* at 14:51–53.

3. Claims 5, 6, 8–10

With respect to claims 5, 6 and 8–10 challenged by Petitioner as obvious over Li and Lee, Lee is not relied on to show “pre-set UE number” regardless of what construction of the term is adopted.

4. Conclusion

For the same reasons set forth in Section III.E.2, Petitioner has not shown by a preponderance of the evidence that claims 5, 6, and 8–10 would have been obvious over Li and Lee.

G. Obviousness of Claim 12 over Li and Zhao

Petitioner alleges claim 12 would have been obvious over Li and Zhao. Pet. 35–37. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 122–124.

1. Li (Ex. 1005)

Li was described in Section III.E.1 above.

2. Zhao (Ex. 1012)

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 ¶ 1. A radio access node (RAN) refers to an eNodeB. *Id.* ¶ 2. The RAN 10 receives a preamble from the UE as part of MSG1 and responds with a MSG2, the random access response. *Id.* ¶ 31. “The UE . . . then responds by sending a third message (MSG3)” to the RAN. *Id.* If the RAN fails to detect MSG3, it sends a Hybrid Automatic Repeat Request Non-

Acknowledgement (HARQ³ NACK). *Id.* After sending the HARQ NACK, the eNodeB sends a “direct order” to the UE “to restart the random access procedure with the same preamble.” *Id.* This procedure has the benefit of enabling the UE “to synchronize with the network.” *Id.*

3. Claim 12

With respect to claim 12 challenged by Petitioner as obvious over Li and Zhao, Zhao is not relied on to show “pre-set UE number” regardless of what construction of the term is adopted.

4. Conclusion

For the same reasons set forth in Section III.E.2, Petitioner has not shown by a preponderance of the evidence that claim 12 would have been obvious over Li and Zhao.

H. Obviousness of Claim 17 over Li and Jiang

Petitioner alleges claim 17 would have been obvious over Li and Jiang. Pet. 37–39. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 125–127.

1. Li (Ex. 1005)

Li was described in Section IV.E.1 above.

2. Jiang (Ex. 1006)

Jiang teaches a random access procedure for MTC terminals belonging to a group. Ex. 1006 ¶¶ 36–38. Jiang discloses a random access process involving message 1 (sending of the random access preamble to the base station/eNodeB by the MTC UE), message 2 (random access response from the base station), message 3 (RRC connection request), and a message

³ Zhao is printed with “HARK NACK” but latter corrects to “Hybrid Automatic Repeat Requests (HARQ).” Ex. 1012 ¶ 31.

4. *Id.* ¶¶ 39–56. Jiang’s repeatedly sends the preamble if a random access response is not received from the eNodeB within a predetermined time interval. *Id.*

3. Claim 17

With respect to claim 17 challenged by Petitioner as obvious over Li and Jiang, Jiang is not relied on to show “pre-set UE number” regardless of what construction of the term is adopted.

4. Conclusion

For the same reasons set forth in Section III.E.2, Petitioner has not shown by a preponderance of the evidence that claim 17 would have been obvious over Li and Jiang.

I. Obviousness of Claims 1–4, 7, 13 over Kim and Li

Petitioner alleges claims 1–4, 7, and 13 would have been obvious over Kim and Li. Pet. 39–49. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 88–104.

1. Kim (Ex. 1011)

Kim is entitled “D2D Signal Transmission Method and User Equipment.” Ex. 1011 at code (54). Kim describes a method whereby “user equipment located outside network coverage or in partial network coverage performs device-to-device (D2D) communication.” *Id.* at code (57). The method, “[a]n evolved universal mobile telecommunications system (E-UMTS) is an advanced version of a legacy universal mobile telecommunications system (UMTS) and basic standardization thereof is currently underway in the 3GPP,” 3rd generation partnership long term evolution (LTE)). *Id.* ¶¶ 2–4. “E-UMTS includes a user equipment (UE), evolved Node Bs (eNode Bs or eNBs), and an access gateway (AG) which

is located at an end of an evolved UMTS terrestrial radio access network (E-UTRAN) and connected to an external network.” *Id.* ¶ 5.

Kim’s Figure 5 is reproduced below.

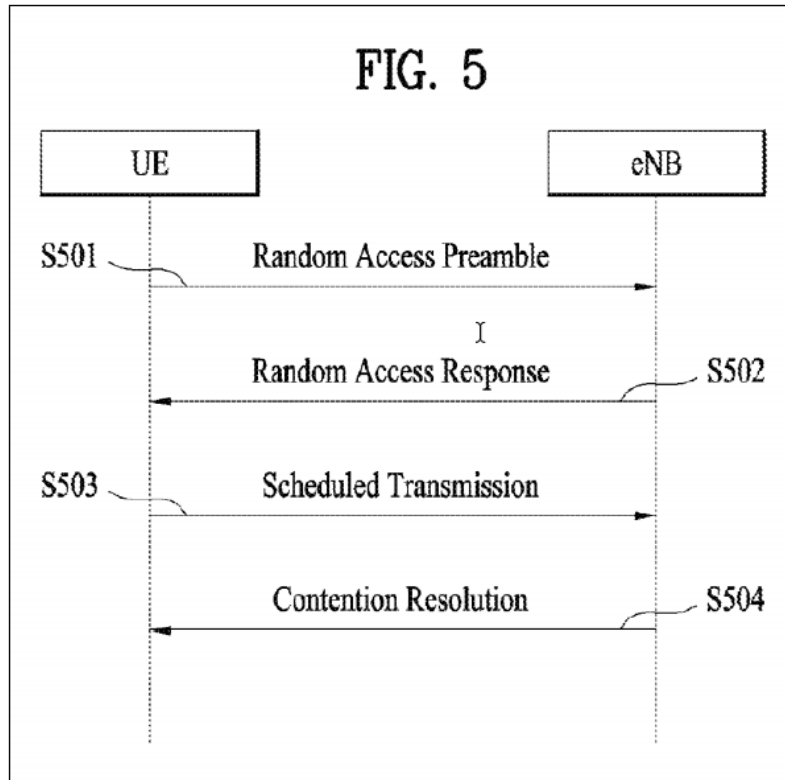


Figure 5 illustrates a random access procedure of the present invention.

Ex. 1011 ¶ 35. Figure 5 illustrates operations of the “UE and the eNB performed in the condition-based random access procedure.” *Id.* ¶ 83.

As illustrated in Figure 5 step S501, message 1 is transmitted by UE which “may randomly select a random access preamble from a set of random access preambles indicated through system information or an HO (handover) command, and select and transmit a physical RACH (PRACH) resource on which the random access preamble may be transmitted (S501).”

Ex. 1011 ¶¶ 70, 85.

In message 2, at step S502,⁴ a random access response information is received. Ex.1011 ¶ 87. The UE attempts to receive a random access response within a “window indicated through the system information or an HO command by an eNB,” and receives corresponding a RA-RNTI (random access radio network temporary identifier). *Id.* ¶¶ 80, 87.

Still referencing Figure 5, message 3 is transmitted at step S503. Ex. 1011 ¶¶ 88–89.

Message 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.

Id. ¶ 89.

As also shown in Figure 5, message 4 at step 504 is received at the UE, including the UE ID obtained through the UL grant included in the random access response.⁵ Ex. 1011 ¶¶ 91–92. The UE attempts to receive a PDCCH (physical downlink control channel) in order to receive a specific message. *Id.* ¶¶ 60, 91–92.

Resources for D2D communication may be assigned by an eNB. To this end, a transmission (Tx) UE performing D2D communication may make a request to the eNB for a radio resource, and the eNB may assign a resource in response. Thereby, the Tx UE may transmit signals to one or more reception (Rx) UEs through the assigned resource. In the following description, a method for a Tx UE to randomly access an eNB in a manner different from the aforementioned typical D2D communication or in a manner similar to the random access procedure to initiate D2D communication is proposed.

Ex. 1011 ¶ 93.

⁴ Kim incorrectly uses S402.

⁵ RAR. *See* Section II.C.1 above.

2. Li (Ex. 1005)

Li is described in Section III.E.1 above.

3. Claims 1–4, 7, 13

With respect to claims 1–4, 7, 13 challenged by Petitioner as obvious over Kim and Li. Pet. 39–49. Petitioner relies on Kim to show limitation 1.f, the “pre-set UE number” limitation. *Id.* at 46–47. Our construction of “pre-set UE number” is dispositive of this ground for the same reasons as set forth above with respect to the challenge based on Li. *See* Sections III.B.1 and III.E above. Petitioner agrees that both Li and Kim “don’t disclose that the message 3 includes a ‘pre-set number of UEs’” under our final construction of “pre-set UE number.” Pet. Reply 4; *see also* Tr. 7:20–22 (“Under [the District Court] construction, Li and Kim would not disclose Claim 1, at least Claim 1, of the [’]430 patent”); 11:3–17 (Petitioner’s counsel arguing claim 18 is indefinite but agreeing neither claim 1 nor 18 have been shown unpatentable under the District Court construction of “pre-set UE number”).

4. Conclusion

Petitioner has not shown by a preponderance of the evidence that claims 1–4, 7, and 13 would have been obvious over Kim and Li.

J. Obviousness of Claims 5, 6, 8–10 over Kim, Li, and Lee

Petitioner alleges claims 5, 6, and 8–10 would have been obvious over Kim, Li, and Lee. Pet. 50–57. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 105–121.

1. Kim (Ex. 1011)

Kim was described in Section III.I.1 above.

2. Li (Ex. 1005)

Li was described in Section III.E.1 above.

3. Lee (Ex. 1007)

Lee was described in Section III.F.2 above.

4. Claims 5, 6, and 8–10

With respect to claim 5, 6, and 8–10 challenged by Petitioner as obvious over Kim, Li, and Lee, neither Li or Lee is relied on to show “pre-set UE number” regardless of what construction of the term is adopted.

5. Conclusion

Petitioner has not shown by a preponderance of the evidence that claim 5, 6, and 8–10 would have been obvious over Kim, Li and Lee.

K. Obviousness of Claim 12 over Kim, Li, and Zhao

Petitioner alleges claim 12 would have been obvious over Kim, Li, and Zhao. Pet. 57–58. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 122–124.

1. Kim (Ex. 1011)

Kim was described in Section III.I.1 above.

2. Li (Ex. 1005)

Li was described in Section III.E.1 above.

3. Zhao (Ex. 1012)

Zhao was described in III.G.2 above.

4. Claim 12

With respect to claim 12 challenged by Petitioner as obvious over Kim, Li, and Zhao, neither Li or Zhao is relied on to show “pre-set UE number” regardless of what construction of the term is adopted.

5. Conclusion

Petitioner has not shown by a preponderance of the evidence that claim 12 would have been obvious over Kim, Li, and Zhao.

L. Obviousness of Claim 17 over Kim, Li, and Jiang

Petitioner alleges claim 17 would have been obvious over Kim, Li, and Jiang. Pet. 58–59. Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 125–127.

1. Kim (Ex. 1011)

Kim was described in Section III.I.1 above.

2. Li (Ex. 1005)

Li was described in Section III.E.1 above.

3. Jiang (Ex. 1006)

Jiang was described in III.H.2 above.

4. Claim 17

With respect to claim 17 challenged by Petitioner as obvious over Kim, Li, and Jiang, neither Li or Jiang is relied on to show “pre-set UE number” regardless of what construction of the term is adopted.

5. Conclusion

Petitioner has not shown by a preponderance of the evidence that claim 17 would have been obvious over Kim, Li, and Jiang.

M. Claim 18 as Anticipated by Kim

Petitioner alleges claim 18 would have been anticipated by Kim. Pet. 59–62. Petitioner also references its showing related to Kim for claim 1 as obvious over Kim and Li. *Id.* at 61 (citing Pet. 39–42). Petitioner also relies on the Ding Declaration. Ex. 1002 ¶¶ 128–133. The Ding Declaration also references the showing made for claim 1 as obvious over Kim and Li. *Id.* ¶ 130 (citing Ex. 1002 ¶¶ 89–93).

1. Kim (Ex. 1011)

Kim was described in Section III.I.1 above.

2. Claim 18

Kim is relied on by Petitioner to show the “pre-set UE number” limitation, limitation 18.e. Pet. 62 (citing Pet. 46–47). For the reasons above, Kim does not show limitation 18.e. *See* Section III.I.3 above.

3. Conclusion

Petitioner has not shown by a preponderance of the evidence that claim 18 would have been anticipated by Kim.

IV. CONCLUSION

For the reasons discussed above, Petitioner has not shown by a preponderance of the evidence that claims 1–15 and 17–18 of the ’430 patent are unpatentable as summarized in the table below.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has not shown by a preponderance of the evidence that challenged claims 1–15 and 17–18 of the ’430 patent are unpatentable; and

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

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–3, 7, 11, 13–15, 18	102	Li		1–3, 7, 11, 13–15, 18
5–6, 8–10	103	Li, Lee		5–6, 8–10
12	103	Li, Zhao		12
17	103	Li, Jiang		17
1–4, 7, 13	103	Kim, Li		1–4, 7, 13
5–6, 8–10	103	Kim, Li, Lee		5–6, 8–10
12	103	Kim, Li, Zhao		12
17	103	Kim, Li, Jiang		17
18	102	Kim		18
Overall				1–15, 17–18

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