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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number: 167455

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number: 167455

OR



Firm or individual name

Address

City

State

Zip

Country

Telephone

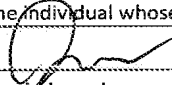
Email

Assignee name and address: Pantech Corporation
8 Yangjaecheonro-21gil, Suite 402, Seocho-gu
Seoul 06748 Republic of Korea

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature 

Date 4/24/2020

Name Yang Won Jung

Telephone 82-10-2250-9592

Title Vice President

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: PANTECH CORPORATIONApplication No./Patent No.: _____ Filed/Issue Date: 2021-05-17Titled: APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEMPANTECH CORPORATION, a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: KWON, KIBUM et al. To: PANTECH CO., LTD.The document was recorded in the United States Patent and Trademark Office at
Reel 028776, Frame 0338, or for which a copy thereof is attached.2. From: PANTECH CO., LTD. To: PANTECH INC.The document was recorded in the United States Patent and Trademark Office at
Reel 039428, Frame 0268, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Pantech Wireless, LLC Ex. 2023

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: PANTECH INC To: GOLDPEAK INNOVATIONS INC

The document was recorded in the United States Patent and Trademark Office at
Reel 042098, Frame 0451, or for which a copy thereof is attached.

4. From: GOLDPEAK INNOVATIONS INC To: PANTECH CORPORATION

The document was recorded in the United States Patent and Trademark Office at
Reel 052657, Frame 0066, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Yeasun Yoon, Reg.# 73663/

2021-05-17

Signature

Date

Yeasun Yoon

73663

Printed or Typed Name

Title or Registration Number

Privacy Act Statement

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
-------------------------------	--

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or
☒ United States application or PCT international application number 14/733,068
filed on 2015-06-08

The above-identified application was made or authorized to be made by me.

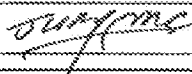
I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Myungcheul JUNG Date (Optional): 2015-08-13
Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
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As the below named inventor, I hereby declare that:

This declaration is directed to: ☒ The attached application, or
☐ United States application or PCT international application number _____
filed on _____

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Kibum KWON

Date (Optional): 2015-06-08

Signature: *Kibum Kwon*

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

5 **[0001]** This application is a continuation of U.S. Patent Application No. 16/733,106, filed on January 2, 2020, which is a continuation of U.S. Patent Application No. 15/820,980, filed on November 22, 2017, which is a Continuation of U.S. Patent Application No. 14/733,068, filed on June 8, 2015, now issued as U.S. Patent No. 9,854,545, which is a Continuation of U.S. Patent Application No. 13/578,531, filed on August 10, 2021, now issued as U.S. Patent No. 9,054,835, which is the
10 National Stage Entry of International Application No. PCT/KR2011/000909, filed on February 10, 2011, and claims priority from and the benefit of Korean Patent Application No. 10-2010-0012564, filed on February 10, 2010, Korean Patent Application No. 10-2010-0027230, filed on March 26, 2010, and Korean Patent Application No. 10-2011-0008683, filed on January 28, 2011, all of which are hereby incorporated by reference for all purposes as if fully set forth herein.

15

BACKGROUND

[0002] FIELD

[0003] The present invention relates to a method and apparatus for establishing an uplink (UL) synchronization in a wireless communication system, and more particularly, to a method and
20 apparatus for configuring a UL synchronization with respect to at least one Component Carrier (CC).

[0004] DISCUSSION OF THE BACKGROUND

[0005] Synchronization between a user equipment (UE) and an evolved node B (eNB) is an important issue in a wireless communication system since transmission/reception of information between the UE and the eNB may not be performed without synchronization.

[0006] Current wireless communication system needs to satisfy a user demand through use of a plurality of CCs, unlike a conventional wireless communication system that supports a single component carrier (CC) or a single service band. However, a detailed scheme for synchronization with respect to the plurality of CCs has not been provided yet.

5 [0007] Accordingly, there is a desire for a scheme for effective synchronization in a wireless communication using a plurality of CCs since synchronization is a factor that has a great effect on an efficiency of a network.

SUMMARY

10 [0008] Therefore, the present invention has been made in view of the above-mentioned problems, and an aspect of the present invention is to provide a method and apparatus for effectively operating a synchronization process by configuring an uplink (UL) synchronization in a wireless communication network supporting a plurality of CCs of Carrier Aggregation system for efficiency of a network, and secures stability of transmission/reception.

15 [0009] Another aspect of the present invention is to provide a method and apparatus for establishing synchronization in a wireless communication system.

[0010] Another aspect of the present invention is to provide a method and apparatus for transmitting/receiving synchronization information to be used for establishing synchronization in a wireless communication system.

20 [0011] Another aspect of the present invention is to provide a method and apparatus for configuring a synchronization group with respect to a plurality of CCs in a wireless communication system.

[0012] Another aspect of the present invention is to provide a method and apparatus for configuring a synchronization group with respect to a plurality of CCs based on a connection

mode of a UE in a wireless communication system.

[0013] Another aspect of the present invention is to provide a method and apparatus for configuring a synchronization group based on characteristics of a plurality of CCs available in a wireless communication system.

5 [0014] Another aspect of the present invention is to provide a method and apparatus of a UE that may configure a UL timing synchronization group with respect to a plurality of CCs in a wireless communication system.

[0015] Another aspect of the present invention is to provide a method and apparatus of a UE that may obtain synchronization information associated with a plurality of CCs through a
10 random access procedure in a wireless communication system, and may establish and update synchronization with an eNB.

[0016] In accordance with an aspect of the present invention, there is provided a method for an eNB to establish an uplink (UL) synchronization in a wireless communication system, the method including: receiving a synchronization request message from a user equipment (UE)
15 through one or more delegate CCs in a UL timing group; and transmitting UL synchronization information corresponding to the UL timing group to the UE through the one or more CCs, so as to establish the UL synchronization, and the one or more delegate CCs are selected by the UE based on a state of the UL timing group and characteristics of a plurality of CCs forming the UL timing group, so as to establish the UL synchronization.

20 [0017] In accordance with another aspect of the present invention, there is provided a method for a UE to establish a UL synchronization in a wireless communication system, the method including: transmitting a synchronization request message to an eNB through one or more delegate CCs in a UL timing group; receiving UL synchronization information

corresponding to the UL timing group for establishing the UL synchronization, from the eNB through the one or more delegate CCs; and establishing synchronization by applying, to the UL timing group, the UL synchronization information received through the one or more delegate CCs, and the one or more delegate CCs are selected by the UE based on a state of the UL timing group and characteristics of a plurality of CCs forming the UL timing group, so as to establish the UL synchronization.

[0018] In accordance with another aspect of the present invention, there is provided an eNB to establish a UL synchronization in a wireless communication system, the eNB including: a controller to generate UL synchronization information corresponding to a UL timing group, so as to establish the UL synchronization; and a transceiving unit to receive a synchronization request message from a user equipment (UE) through one or more delegate CCs in the UL timing group, and to transmit the UL synchronization information to the UE through the one or more delegate CCs, and the one or more delegate CCs are selected by the UE based on a state of the UL timing group and characteristics of a plurality of CCs forming the UL timing group, so as to establish the UL synchronization.

[0019] In accordance with another aspect of the present invention, there is provided a UE to establish a UL synchronization in a wireless communication system, the UE including: a transceiving unit to transmit a synchronization request message to an eNB through one or more delegate CCs in a UL timing group, and to receive UL synchronization information corresponding to the UL timing group through the one or more delegate CCs; a controller to determine the UL synchronization information received by the transceiving unit; and a UL timing adjusting unit to establish a UL synchronization of the UL timing group, based on the UL synchronization information determined by the controller, and the one or more delegate CCs are

selected by the UE based on a state of the UL timing group and characteristics of a plurality of CCs forming the UL timing group, so as to establish the UL synchronization.

BRIEF DESCRIPTION OF THE DRAWINGS

5 **[0020]** FIG. 1 is a diagram illustrating an example of configuring a plurality of component carriers (CCs);

[0021] FIG. 2 is a diagram illustrating an example associated with a timing advance (TA) of a synchronization process;

[0022] FIG. 3 is a diagram illustrating a random access process performed between a user
10 equipment (UE) and an evolved Node-B (eNB);

[0023] FIG. 4 is a diagram illustrating a process that obtains an uplink (UL) synchronization according to an embodiment of the present invention;

[0024] FIG. 5 is a diagram illustrating a process that obtains a Up Link(UL) synchronization according to another embodiment of the present invention;

15 **[0025]** FIG. 6 is a diagram illustrating a process that obtains a UL synchronization according to still another embodiment of the present invention;

[0026] FIG. 7 is a diagram illustrating a process in which an eNB enables the UE to obtain a UL synchronization in response to a request from the UE according to an embodiment of the present invention;

20 **[0027]** FIG. 8 is a diagram illustrating a process in which a UE obtains a UL synchronization through use of a UL timing group according to an embodiment of the present invention;

[0028] FIG. 9 is a diagram illustrating a process in which a UE obtains a UL

synchronization through use of a UL timing group according to an embodiment of the present invention;

[0029] FIG. 10 is a block diagram of an eNB according to an embodiment of the present invention; and

5 [0030] FIG. 11 is a block diagram of a UE according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0031] Hereinafter, exemplary embodiments of the present invention will be described
10 with reference to the accompanying drawings. In the following description, the same elements will be designated by the same reference numerals although they are shown in different drawings. Further, in the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

15 [0032] The specifications will describe a wireless communication system as an example, and operations performed in wireless communication may include all operations performed in a system that manages the wireless communication and a wireless communication device that transmits data. The wireless communication system may provide various communication services such as voice data, packet data, and the like. According to an embodiment, the wireless
20 communication system may include, for example, a user equipment (UE) and an evolved Node-B (eNB).

[0033] The UE may be an inclusive concept indicating a user terminal utilized in a wireless communication, including a UE in Wideband Code Division Multiple Access

(WCDMA), Long Term Evolution (LTE), High Speed Packet Access (HSPA), and the like, and a mobile station (MS), a user terminal (UT), a subscriber station (SS), a wireless device and the like in Global System for Mobile Communications (GSM).

[0034] The eNB or a cell may refer to a fixed station where communication with the UE is performed, and may also be referred to as a Node-B, a base transceiver system (BTS), an access point, and the like.

[0035] The eNB or the cell may be construed as an inclusive concept indicating a portion of an area covered by a radio network controller (RNC) in WCDMA, and the like, and the concept may include various cell coverage areas, such as a megacell, macrocell, a microcell, a picocell, a femtocell, and the like.

[0036] In the specifications, the UE and the eNB are used as two inclusive transceiving subjects to embody the technology and technical concepts described in the specifications, and may not be limited to a predetermined term or word.

[0037] A multiple access scheme applied to the wireless communication system may not be limited. The wireless communication system may utilize varied multiple access schemes, such as Code Division Multiple Access (CDMA), Time Division Multiple Access (TDMA), Frequency Division Multiple Access (FDMA), Orthogonal Frequency Division Multiple Access (OFDMA), Orthogonal Frequency Division Multiple Frequency Division Multiple Access (OFDM-FDMA), Orthogonal Frequency Division Multiple Time Division Multiple Access (OFDM-TDMA), Orthogonal Frequency Division Multiple Code Division Multiple Access (OFDM-CDMA), and the like. Uplink (UL) transmission and downlink (DL) transmission may be performed based on a time division duplex (TDD) scheme that performs transmission based on different times, or based on a frequency division duplex (FDD) scheme that performs

transmission based on different frequencies.

[0038] An embodiment of the present invention may be applicable to an asynchronous wireless communication scheme that is advanced through GSM, WCDMA, and HSPA, to be LTE and LTE-advanced, and may be applicable to a synchronous wireless communication scheme that is advanced through CDMA and CDMA-2000, to be UMB. Embodiments of the present invention may not be limited to a specific wireless communication scheme, and may be applicable to all technical fields to which a technical idea of the present invention is applicable.

[0039] FIG. 1 illustrates an example of a wireless communication system that uses a plurality of CCs according to an embodiment of the present invention.

[0040] Referring to FIG. 1, the wireless communication system may be a next generation communication system, including an LTE system and an LTE-A system.

[0041] The LTE/LTE-A system may extend a bandwidth to satisfy a high data transmission rate corresponding to a system requirement, and may use a plurality of component carriers (CCs) which are unit carriers. Here, a single CC may have a maximum bandwidth of 20 megahertz (MHz). Resource allocation may be performed within a bandwidth of 20 MHz depending on a service. However, it is merely an example during a process of embodying a system. Depending on a configuration of a system, a single CC may be configured to have a bandwidth smaller than or equal to 20 MHz. Also, a plurality of CCs may be bound and used as a single system band, and may be referred to as a carrier aggregation (CA).

[0042] As illustrated in FIG. 1, when five CCs having a maximum bandwidth of 20 MHz are used, a bandwidth may be expanded up to 100 MHz to support a quality of service. In this example, an allocable frequency band, which may be determined by each CC, may be contiguous or non-contiguous based on a scheduling of the CA.

[0043] Throughout the specifications, a component carrier may be denoted by a CC and may be distinguished by names, for example, CC0, CC1, and the like. However, a number included in a name of each CC may not always match an order of a corresponding CC or a location of a frequency band of the corresponding CC.

5 [0044] Referring to FIG. 1, the CA may be configured to include a first CC (CC1) 110, a second CC (CC2) 120, a third CC (CC3) 130, and an Nth CC (CCN) 140. A UL and a DL allocated to each CC may be different from each other, or may be the same as one another based on a scheduler.

[0045] In a wireless communication environment, an electric wave may experience a
10 propagation delay while the electric wave is transferred from a transmitter to a receiver. Accordingly, although both the transmitter and the receiver are accurately aware of a time when the electric wave is transmitted from the transmitter, a time when the electric wave is received by the receiver may be affected by a distance between the transmitter and the receiver, an ambient propagation environment, and the like, and may vary over time when the receiver moves. When
15 the receiver is not accurately aware of a point in time when a signal transmitted from the transmitter is to be received, the receiver may fail to receive the signal, or may receive a signal distorted due to the propagation delay and may fail to perform communication.

[0046] Accordingly, in the wireless communication system, synchronization between the eNB and the UE may be established first to receive a signal, irrespective of a UL and a DL. That
20 is, a synchronization process is an essentially important process in a communication system, and maintaining the synchronization process may also significantly affect a stability of the system and a quality of communication.

[0047] There may be various types of synchronization, such as a frame synchronization,

an information symbol synchronization, a sampling period synchronization, and the like. The sampling period synchronization may need to be obtained basically, so as to distinguish a physical signal.

[0048] In DL transmission corresponding to a communication link of transmission in a direction from the eNB to the UE, synchronization may be obtained in the UE based on a signal of the eNB. The eNB may transmit a predetermined signal that is mutually prearranged, so that the UE may readily obtain a DL synchronization, and the UE may need to accurately distinguish a time when the predetermined signal is transmitted from the eNB. In a case of a DL, a single eNB may simultaneously transmit the same synchronization signal to a plurality of UEs and thus, each UE may independently obtain synchronization based on the synchronization signal.

[0049] Conversely, in a case of a UL, the eNB may receive signals transmitted from the plurality of UEs and thus, the eNB may have difficulty in obtaining synchronization based on one of the UEs. Accordingly, a synchronization process that is different from the DL may be required.

[0050] When distances between the UEs and the eNB are different from each other, the UEs may have different transmission delay times. When each UE transmits UL information based on a corresponding DL synchronization, information transmitted from each UE may be received by the eNB at different times.

[0051] Although the uplink information transmitted from each UE is received at different times, the information may be received with a complexity being increased when a transmission scheme adopted by the wireless communication system, such as CDMA, is capable of separately receiving the information. However, in a wireless communication system that is based on OFDMA or FDMA, uplink transmission information of all the UEs may be simultaneously

received by the eNB and may be demodulated and thus, a reception performance may increase as the uplink transmission information is received at an accurate time, and a reception performance may be rapidly deteriorated as a reception time difference of each UE signal received in the eNB is increased.

5 **[0052]** Accordingly, in a wireless communication system that utilizes OFDMA or SC-FDMA as a UL transmission scheme, such as LTE, a timing alignment value may be calculated for each UE based on a random access scheme and the like, to obtain a transmission delay time in a DL and a transmission delay time in a UL, and each UE may be informed of the calculated TA value, so that a UL synchronization is obtained.

10 **[0053]** FIG. 2 illustrates an example associated with a timing advance (TA) in a synchronization process according to an embodiment of the present invention.

[0054] In general, a UL radio frame i 220 may need to be transmitted at the same point in time as a point in time when a DL radio frame i 210 is transmitted, so as to perform communication between an eNB and a UE. However, a time difference may exist between the
15 UE and the eNB due to propagation delay and the like.

[0055] Accordingly, a TA may be applied to enable the UE to transmit the UL radio frame i 220 a little earlier than the DL frame i 210 by taking the propagation delay into consideration, so that synchronization between the eNB and the UE may be obtained. An equation to calculate the TA may be expressed by Equation 1.

20 **[0056]** [Equation 1]

$$TA = (N_{TA} + N_{TA\text{ offset}}) \cdot T_s \text{ seconds}$$

[0057] Here, N_{TA} denotes a value to be variable based on TA command information transmitted from the eNB, and $N_{TAoffset}$ denotes a value set based on a frame structure. T_s denotes a sampling period. As shown in FIG. 2, to obtain a UL synchronization, the UE may receive the TA command information provided by the eNB, and may proceed with a TA based on the received TA command information so that UE may obtain synchronization with the eNB for wireless communication.

[0058] FIG. 3 illustrates a random access process performed between a UE and an eNB according to an embodiment of the present invention.

[0059] To perform transmission and reception of data with an eNB 390, a UE 380 may need to obtain a UL synchronization. To obtain the UL synchronization, the UE 380 may proceed with a process of receiving information required for synchronization, from the eNB 390. FIG. 3 shows a random access procedure for receiving information required for synchronization. The random access procedure may be applicable when a UE is newly coupled to a network through a handover and the like. Also, upon completing the coupling, the UE may proceed with the random access procedure even under a circumstance such as synchronization, a state change, for example, from an RRC_IDLE to an RRC_CONNECTED, and the like.

[0060] The UE 380 may randomly select a preamble signature so as to generate a random access preamble (RAP). Subsequently, the UE 380 may transmit the selected preamble to the eNB 390 (step S310). The process of selecting the preamble signature may be contention-based selection or contention-free selection. In this example, the eNB may inform the UE of a previously reserved RAP, and the UE may transmit, to the eNB 390, a preamble selected based on received information (step S310). Also, according to the contention-free selection, a procedure associated with a contention resolution (CR) message, which is required in the

contention-based selection, may not need to be performed.

[0061] Here, the UE 380 may recognize random access-radio network temporary identifier (RA-RNTI) based on a transmission time and a frequency resource temporarily selected for selecting a preamble or for random access channel (RACH) transmission.

5 [0062] The eNB 390 may perform random access response (RAR) with respect to the preamble received from the UE 380. In this example, the eNB 390 may transmit an RAR message through a physical downlink shared channel (PDSCH).

[0063] Information transmitted through the RAR message may include, for example, identification information of the UE preamble received by the eNB, an identifier (ID) of the eNB, a temporary cell radio network temporary identifier (C-RNTI), information associated with
10 a time slot where the preamble is received, TA information, and the like. Timing information for a UL synchronization may be received through the RAR message and thus, the UE 380 may perform the UL synchronization with the eNB 390. The UE 380 may perform a scheduled transmission that transmits data at a scheduled time determined based on the TA information
15 received in step S320 (step S330). In this example, the UE 380 may transmit synchronized data through a physical uplink shared channel (PUSCH), and may perform hybrid automatic repeat request (HARQ).

[0064] Examples of a message transmitted in step S330 may include a radio resource control (RRC) connection request, a tracking area update, a scheduling request, and the like.
20 Also, one of the messages may include a temporary C-RNTI, a C-RNTI (if the UE already has one), UE identification information, and the like.

[0065] In steps S310 through 330, collision may occur and thus, when the eNB 390 transmits a CR message (step S340), the UE 380 may i) determine whether a received message

corresponds to the UE 380, and may transmit an acknowledgement (ACK) when the received message corresponds to the UE 380 or ii) may not transmit response data when the received message corresponds to another UE. Also, the UE 380 may not transmit the response data when the UE 380 misses DL allocation or fails to decode the message. Also, the CR message may
5 include a C-RNTI, UE identification information, and the like.

[0066] Unlike a process of obtaining a TA when a single carrier is utilized, in a wireless system that uses a plurality of CCs, TA values of the CCs may have a high probability of being different from each other when locations of center frequencies of the CCs are significantly distant from each other as shown in FIG. 1, when the CCs are supported by different devices in a
10 network, or the like.

[0067] Accordingly, when a synchronization obtaining scheme used for a single carrier is applied as is, the CCs may have difficulty in obtaining the UL synchronization for the CCs. Accordingly, the UE may perform stable UL communication for a few CCs that obtain UL synchronization from among available CCs.

[0068] When the UE transmits, based on the same UL synchronization standard, information through CCs of which UL synchronization standards are different from each other, a probability of transmission error may be significantly high, and a time and resources for restoring the error may be wasted. In this example, it is difficult to satisfy a UL quality of service (QoS) for an application program required by a system.
15

[0069] When the wireless communication uses a plurality of CCs, a transmission delay time may be different in a DL based on a supporting scheme in a radio network and a characteristic of each CC with respect to a single UE. Accordingly, when CCs or CCs having the same TA value are configured as a set, a UL synchronization standard may be different for
20

each CC set and thus, UL performance may be deteriorated.

[0070] Therefore, embodiments of the present invention for a wireless communication system supporting a plurality of CCs, are provided so that the UE obtains a UL synchronization of a corresponding CC or a group of CCs based on a type of each CC, a location of a center frequency, a network service type, and the like when CCs or groups including at least one CC have different UL synchronization standards.

[0071] Hereinafter, a user terminal may be referred to as a UE and a base station may be referred to as an eNB.

[0072] FIG. 4 illustrates a process that obtains a UL synchronization according to an embodiment of the present invention.

[0073] FIG. 4 shows a process in which a UE configures a group associated with a timing from among a plurality of CCs and performs RAP through a delegate CC when an eNB transmits information associated with the CCs to the UE.

[0074] Referring to FIG. 4, when an RRC connection mode is an RRC_CONNECTED mode indicating that a UE 480 and an eNB 490 are connected, step S410 may be performed. When the RRC connection mode is an IDLE mode or requires resetting, step S405 may be performed first, and then step S410 may be performed.

[0075] In step S405, RRC connection may be performed. When the RRC connection mode between the eNB 490 and the UE 480 is the IDLE mode or requires resetting, the eNB 490 may have difficulty in defining a CC set of the corresponding UE and transmitting CC set information in the IDLE mode UE. Therefore, the CC set information may be formed by selecting at least one CC to perform RRC connection so that the RRC connection is performed (step S405). At least one CC to perform the RRC connection may be selected based on one of

the following methods.

[0076] i) select a CC that is most appropriate for attempting RRC connection based on information measured by the UE 480

5 [0077] ii) attempt RRC connection based on information fixedly set in a system and stored in an internal memory of the UE 480

[0078] iii) attempt RRC connection based on information transmitted to the UE 480 from the eNB 490 through system information

[0079] iv) attempt RRC connection through CCs corresponding to system information of the available CCs stored in an internal memory of the UE 480

10 [0080] For example, a UE in an IDLE mode may select a single DL CC for the RRC connection based on the conditions, and may receive system information via a broadcasting channel that is transmitted through the selected CC. Based on the received system information, the selected DL CC and a UL CC having a linkage with the DL CC may be configured as a primary serving cell (PCell). The UE may transmit, to an eNB, an RRC connection request
15 message through the PCell. In this example, the UE may transfer the RRC connection request message to the eNB through an RACH procedure.

[0081] Here, the DL CC corresponding to the PCell may be referred to as a DL primary CC (DL PCC), and the UL CC corresponding to the PCell may be referred to as a UL primary CC (UL PCC). Also, a CC corresponding to a secondary serving cell (SCell) 920 in a DL may
20 be referred to as a DL secondary CC (DL SCC), and a CC corresponding to the SCell in a UL may be referred to as a UL secondary CC (UL SCC).

[0082] The PCell and the SCell have characteristics as follows.

[0083] First, the PCell may be used for PUCCH transmission.

[0084] Second, the PCell is always activated, whereas the SCell 920 is activated or deactivated based on a predetermined condition.

[0085] Third, when the radio link failure (RLF) is detected via PCell, RRC reconnection PCell may be triggered. When the RLF is detected via SCell 920, RRC reconnection on SCell
5 may not be triggered.

[0086] Fourth, the PCell may be changed by a change of a security key or by a handover procedure accompanying the RACH procedure. In a case of an MSG4 (contention resolution), only a PDCCH that indicates the MSG4 may be transmitted through the PCell, and MSG4 information may be transmitted through the PCell or the SCell.

10 [0087] Fifth, non-access stratum (NAS) information may be received through the PCell.

[0088] Sixth, the PCell may be configured as a pair of a DL PCC and a UL PCC.

[0089] Seventh, each UE sets a different CC as the PCell.

[0090] Eighth, a procedure such as, reconfiguration, adding, and removal of the SCell may be performed by an RRC layer. To add a new SCell, RRC signaling may be used to
15 transmit system information associated with a dedicated SCell.

[0091] Technical concept of the PCell and the SCell in embodiments of the present invention may not be limited to the descriptions provided in the foregoing, and may include further examples.

[0092] When RRC connection setup is completed through one of the methods, and the
20 RRC connection mode between the eNB 490 and the UE is the RRC_CONNECTED mode, step S410 may be performed.

[0093] The eNB 490 may allow the UE 480 to use a plurality of CCs based on a performance of hardware of the UE 480, available frequency resources of the eNB 490, and the

like, and may define the plurality of CCs to be a CC set. The eNB 490 may transmit, to the UE 480, CC set information associated with the CC set that is allowed to the UE 480 (step S410).

[0094] As described in the foregoing, the UE 480 and the eNB 490 maintain the RRC_CONNECTED mode from step S405 or before. That is, a UL synchronization of a UL CC through which the RRC connection of the UE 480 is set up is maintained. The UE 480 may receive the CC set information determined based on the above condition, from the eNB 490.

[0095] According to a scheme of transmitting and receiving the CC set information, the eNB 490 may include the CC set information in an RRC reconfiguration message for transmission to the UE 480, or may use another message for transmission.

[0096] Also, the CC set information may be configured by adding/removing each CC. For example, when initial CC set information is transmitted, the CC set information configured of DL CC1, DL CC2, and DL CCN may be configured as an added DL CC list and the list may include CC1, CC2, and CCN. In the same manner, UL CC set information may be configured as an added UL CC list.

[0097] As another example, when the CC set information is changed, that is, when the configured DL CC set is changed into CC1, CC3, and CCN, the DL CC set information may be transmitted by configuring CC2 as a removed DL CC list and CC3 as an added DL CC list.

[0098] The UE 480 may receive system information (SI) associated with CCs in the CC set, based on the received CC set information (step S420).

[0099] When a CC that is incapable of transmitting SI to a corresponding CC exists from among the CCs in the CC set, for example, an extension CC (ECC), or a CC that is incapable of receiving SI transmitted via a broadcasting channel (for example, a DL CC that belongs to an SCell) exists, the SI may be received by a CC that is capable of receiving the SI or may be

received by a CC that is capable of receiving SI that is transformed in a form of control information.

[0100] The transformed SI may be transmitted to the UE together with the CC set information included in the RRC reconfiguration message transmitted by the eNB, or may be transmitted to the UE through the RRC reconfiguration message after the CC set information is received. Also, the current stage may be performed without receiving the SI associated with the corresponding CC.

[0101] The UE 480 may configure a UL timing group including CCs in the CC set as elements of the UL timing group, based on the received SI (step S432). When the UL timing group is configured, considerations may be as follows.

[0102] First, whether a plurality of CCs is assigned to different groups may be determined based on the following conditions. That is, a CC that satisfies at least one of the conditions may be configured to be a different group.

[0103] a-i) CCs of which a difference in center frequency values is greater than or equal to a threshold, are assigned to different groups. When a difference in the center frequency values is high, delay occurring in a wireless signal propagation process may be changed and thus, a difference in TA values may also increase.

[0104] a-ii) CCs to which different beamforming schemes are applied are assigned to different groups. TA values are highly likely to be different from each other when the beamforming schemes are different from each other.

[0105] a-iii) CCs that are set to be updated every time a UL synchronization update request exists are assigned to different groups. The setting may be included in SI set by the eNB 490 for transmission, or may be included in other messages for transmission.

[0106] a-iv) CCs that do not provide services in a macrocell or CCs that provide services in a space superposed on the macrocell by a femtocell, a picocell, a microcell, a relay, a repeater, and the like may have different characteristics from CCs that provide services by the macrocell and thus, the CCs are configured to be different groups.

5 [0107] a-v) a CC that has a UL synchronization update request from the eNB 490 may be a CC that has a changed synchronization and thus, the CC may be assigned to a different group.

[0108] As described in the foregoing, examples of a condition for setting CCs to be a UL timing group may be a-i) through a-v). In addition, CCs are configured to be a single group or to be different groups based on a wireless propagation characteristic, a predetermined measurement
10 value, and the like.

[0109] When one of the following conditions are satisfied, CCs may be configured to be a single group.

[0110] b-i) CCs of which a difference in center frequency values is within a threshold range may have similar propagation characteristic and thus, the CC may be configured to be a
15 single group.

[0111] b-ii) CCs to which the same beamforming scheme is applied may be configured to be a single group

[0112] b-iii) CCs used in devices in the same radio network may be configured to be a single group

20 [0113] b-iv) CCs that do not satisfy conditions a-i through a-v for assigning CCs to different groups may be configured to be a single group

[0114] A method for the UE 480 to generate a group may include two schemes, that is, a scheme of generating groups by distinguishing CCs that belong to different groups and a scheme

of generating a group by distinguishing CCs to be included in the same group. The two schemes may be used together or one of the two schemes may be used. Conditions to be used in a process of applying each scheme have been described in the foregoing.

[0115] When the UL timing group is generated, the UE 480 may select a delegate CC for each group (step S434). In this example, the delegate CC may be selected based on following conditions, from among CCs that are capable of obtaining a TA value to be used for obtaining a UL synchronization.

[0116] c-i) a CC having a lowest center frequency value

[0117] c-ii) a CC having a center frequency value that is closest to a mean value

[0118] c-iii) a CC having a highest center frequency value

[0119] c-iv) a CC having a broadest frequency band

[0120] c-v) a CC that is set to be used for monitoring DL quality

[0121] A CC satisfying one of the conditions may be selected as a delegate CC.

[0122] Here, a CC may be defined to include a DL CC or both the DL CC and a UL CC, and may be defined to be a cell or a serving cell. In other words, the cell may be defined by only DL frequency resources (for example, a CC) through which a wireless signal recognized by a UE reaches a predetermined area, and may be defined to be a pair of the DL frequency resources that is used by the UE to receive a signal from the eNB and UL frequency resources that is used by the UE to transmit a signal to the eNB.

[0123] Therefore, with respect to only a UE that is able to form a plurality of CCs, the eNB may be able to form a plurality of serving cells to perform transmission and reception of data with the UE

[0124] In this example, a PCell may indicate a single serving cell that provides a security

input and NAS mobility information in an RRC establishment state or re-establishment state.

Also, based on the capabilities of the UE, at least one cell may be configured to form a serving cell set with the PCell, and the at least one cell may be referred to as an SCell.

[0125] Accordingly, a serving cell set configured for a single UE may be configured of a single PCell or of a single PCell and at least one SCell. An adjacent cell in a frequency of the PCell and/or an adjacent cell in a frequency of the SCell may be in the same carrier frequency, and adjacent cells in frequencies of the PCell and the SCell may be in different carrier frequencies.

[0126] Here, a CC set for monitoring the DL quality may include an SCell to which a radio link monitoring (RLM) is defined. In particular, the RLM may include a process in which a UE monitors DL quality based on a cell-specific reference (CRS) signal so as to detect DL quality of a serving cell set between the UE and an eNB.

[0127] In this example, the UE may predict the DL quality based on predetermined parameters which are defined by a ratio of the measured CRS to energy of control channels.

[0128] The RLM may be set based on following conditions. To predict the DL quality through the RLM, a value that expresses a ratio of reception energy of an RE (single sub-carrier in a single OFDM symbol) through which a PDCCH/physical control format indicator channel (PCFICH) is transmitted, to an average RE energy of the CRS based on a dB unit may be used as a criterion.

[0129] From among the parameters, a parameter Q_{out} that is a criterion to determine an out-of-sync state may be configured based on a parameter set for transmitting a PDCCH/PCFICH and a value of which a block error rate (BER) of hypothetical PDCCH (based on a DCI format 1A) transmission based on an error of the PCFICH is greater than or equal to

10%. The value may be changed based on a number of antenna ports through which the CRS is transmitted.

[0130] For example, when the CRS is transmitted through a single antenna port, a ratio of energy between the PDCCH and the CRS to be determined as Q_{out} may be based on 4dB, and
5 when the CRS is transmitted through two or more antenna ports, Q_{out} may be based on 1 dB. From among the parameters, a parameter Q_{in} that is a criterion to determine synchronization restoration or in-sync state may be determined based on a value having a sufficiently large reliability when compared to Q_{out} .

[0131] That is, a parameter set for transmitting the PDCCH/PCFICH and a value of
10 which a BER of hypothetical PDCCH (based on a DCI format 1C) transmission based on an error of the PCFICH is greater than or equal to 2% may be used. The value may be changed based on a number of antenna ports through which the CRS is transmitted.

[0132] For example, when the CRS is transmitted through a single antenna port, a ratio of energy between the PDCCH and the CRS to be determined as Q_{in} may be based on 0dB, and
15 when the CRS is transmitted through two or more antenna ports, Q_{in} may be based on -3 dB.

[0133] A reason that an energy ratio used for determining Q_{in} is lower than Q_{out} , is that the energy ratio is based on the parameter set for transmitting the PDCCH/PCFICH and the BER of the hypothetical PDCCH transmission. The parameters set for transmitting the PDCCH/PCFICH may include a DCI format of a PDCCH, a number of OFDM symbols through
20 which control information of a subframe is transmitted, an aggregation level indicating a self-duplication rate of the PDCCH, and the like. The parameters may be affected by a bandwidth of a DL. Q_{out} and Q_{in} may be affected based on whether a UE performs discontinuous reception (DRX) with respect to a corresponding cell.

[0134] Therefore, the UE or the eNB may select a delegate CC in each group. In this example, the UE or the eNB may select the delegate CC by selecting an SCell including the delegate CC. In this example, the delegate CC or the SCell may be selected based on the conditions c-i) through c-v), from among CCs that are capable of obtaining a TA value to be used for obtaining a UL synchronization. That is, one of the c-i) through c-v) may be selected as a delegate CC.

[0135] In this example, according to a method of selecting a delegate CC for each UL timing group, the same criterion may be used for all groups or a different criterion may be used for each timing group. That is, the delegate CC may be selected based on a network state of each group, characteristics of CCs forming each group, and the like.

[0136] After completing steps S432 and S434 for setting a UL timing group and a corresponding delegate CC, to obtain a UL synchronization, the UE 480 may set an RAP through a delegate CC of each group, and may transmit the set preamble by selecting one of the resources defined in SI of each CC (step S440). The preamble may be included in a synchronization request message through which the UE requests synchronization. Transmission of the corresponding preamble may include a case in which the UE 480 sequentially, simultaneously, or randomly transmits a preamble through a selected CC in time/frequency resources set by the eNB 490.

[0137] Cases that require obtaining a UL synchronization may be as follows. Although a condition does not satisfy one of the cases described below, when the UE 480 determines that it is required, the UE 480 may generate an RAP and may transmit the RAP to the eNB 490.

[0138] d-i) a case in which the eNB 490 requires re-establishment of the entire DL synchronization

[0139] d-ii) a case that initializes and retries all UL data transmission

[0140] d-iii) a case in which a time alignment timer of the UE 480 expires

[0141] The UE 480 may transmit a preamble to be used for obtaining a UL synchronization with respect to total available CC groups.

5 [0142] Also, the UE 480 may need to obtain a UL synchronization with respect to a few available CC groups. Relevant cases will be described as follows.

[0143] e-i) a case in which a CC set is initially set and a TA value does not exist in a corresponding group

10 [0144] e-ii) a case in which a response is not obtained in response to UL transmission data transmitted through CCs in a group of the UE 480

[0145] e-iii) a case in which an RRC connection between the eNB 490 and the UE 480 is reconfigured

[0146] e-iv) a case in which the UE 480 performs handover of a predetermined CC group to an eNB 490 that is physically different from the UE 480

15 [0147] e-v) a case in which the eNB 490 requests reconfiguration with respect to a predetermined CC group associated with a DL synchronization.

[0148] e-vi) a case in which a CC time alignment timer expires (the timer is set for each CC or for each group). When a condition satisfies one of the cases, a process for obtaining a UL synchronization with respect to a CC group including a corresponding CC may be performed.

20 [0149] For example, in steps S432 and S434, CC1, CC2, CC3, CC4, and CC5 exist, and CC1 and CC2 are configured to be group 1, and CC3, CC4, and CC5 are configured to be group 2. A delegate CC of group 1 is CC1, a delegate CC of group 2 is CC3. In this example, when a UL synchronization for the total available CC groups is required, the UE 480 may transmit an

RAP through CC1 and CC3. When synchronization needs to be obtained for a few CC groups, that is, when synchronization needs to be obtained for group 2, the UE 480 may transmit an RAP through CC3.

[0150] When a UL synchronization needs to be re-established while data is transmitted through a UL, the UE 480 may perform the following operation first, for example, initializing UL data transmission, and then may perform initializing HARQ buffers, releasing a physical uplink control channel (PUCCH)/ releasing sounding reference signal (SRS), initializing semi-persistent scheduling allocation/allowance, and the like, as a procedure to obtain a UL synchronization.

[0151] The eNB 490 may calculate a TA value for each group with respect to each CC group (each delegate CC) based on the received RAP signal. The eNB 490 may transmit, to the UE 480, UL grant information and a TA value of a UL timing group (a delegate CC) through an RAR message (step S450). The TA value may be an example of UL synchronization information required when the UE adjusts a UL transmission time.

[0152] Subsequently, when the UE 480 determines that the TA value received in a CR procedure (step S460) is valid, the UE 480 may apply the TA value to another CC in the group for updating (step S470).

[0153] As described in the foregoing, when a procedure of obtaining a UL synchronization is performed with respect to all the groups, TA values associated with CC1 and CC3 may be applied to CCs each included in group 1 and group 2. When a TA value of CC3 is received for group 2, the TA value may be applied to CCs included in group 2.

[0154] FIG. 5 illustrates a process that obtains a UL synchronization according to another embodiment of the present invention. Here, FIG. 5 shows that an eNB 590 configures a UL

timing group.

[0155] Referring to FIG. 5, the eNB 590 determines a mode (RRC_CONNECTED/
RRC_IDLE) of a UE before transmitting UL timing information. When the eNB 590 is not
connected to the UE, the eNB 590 may proceed with RRC connection (step S505), and may use
5 a PCell for RRC connection, which will be performed in the same manner as step S405 of FIG.
4.

[0156] A scheme of generating a group in the eNB 590 may be performed based the
conditions a-i) through a-v) or b-i) through b-iv) of FIG. 4.

[0157] Accordingly, the eNB 590 may transmit CC set information of the UE 580 and
10 UL timing group information of the set UL timing group to the UE 580 (step S510). Here, the
UL timing group information may be included in a CC set information message for transmission
to the UE 580, or a separate other message may be used for transmission. A case that uses a
separate message will be described with reference to FIG. 6. The CC set information message
provided for each UE may be an RRC (L3) message, an L1 signaling, or an L2 signaling.

15 [0158] The UE 580 may receive SI of CCs in a set, based on the received CC set
information (step S520). In this example, the UE 580 may use the UL timing group generated by
the eNB 590 in step S508 as it is, or may slightly change the UL timing group based on a current
network state as shown in step S432 of FIG. 4. This may indicate that the UE 580 may change
the UL timing group when the UL timing group generated by the eNB 590 is inappropriate for an
20 environment of the UE 580.

[0159] That is, after receiving a UL timing group or after changing or newly generating a
UL timing group, the UE 580 may select a delegate CC for each UL timing group (step S534).
The conditions taken into consideration when a delegate CC is selected for each UL timing

group have been described in step S434 of FIG. 4.

[0160] After completing selection of a delegate CC for each UL timing group in step S534, when a UL synchronization needs to be obtained, the delegate CC in each group may set an RAP, and may transmit the selected preamble by selecting one of the resources defined in SI of each CC (step S540). The preamble may be included in a synchronization request message through which the UE requests synchronization.

[0161] Here, the UE 580 may transmit an RAP transmit message and the like for obtaining the UL timing information. Also, the corresponding preamble may be sequentially, simultaneously, or randomly selected and transmitted by the UE 580 in time/frequency resources set by the eNB 590.

[0162] A case that requires the UE 580 to obtain a UL synchronization may be associated with conditions d-i) through d-iii). Also, the UE 580 may transmit a preamble to obtain a UL synchronization with respect to available total CC groups. The UE 580 may need to obtain a UL synchronization with respect to a few available CC groups.

[0163] The eNB 590 may calculate a TA value for each group with respect to each CC group (each delegate CC) based on the received RAP signal, and may include the corresponding TA value together with UL grant information in RAR information for transmission to UE 580 (step S550). The TA value may be an example of UL synchronization information required when the UE adjusts a UL transmission time.

[0164] For example, the eNB 590 may calculate a TA value based on the UL timing group set in step S508, and may transmit the calculated TA value. Also, the eNB 590 may transmit the RAR message through a predetermined CC, and may transmit the RAR message through all CCs in the corresponding UL timing group.

[0165] When the UE 580 determines that a TA value received in a CR procedure (step S560) is valid, the UE 580 may apply the TA value to remaining CCs in a group so as to update a TA value for each UL timing group (step S570).

[0166] FIG. 6 illustrates a process that obtains a UL synchronization according to still another embodiment of the present invention. Here, FIG. 6 shows that an eNB 690 configures a UL timing group and transmits group information through a separate message.

[0167] Referring to FIG. 6, the eNB 690 determines a mode (RRC_CONNECTED/RRC_IDLE) of a UE 680. When the eNB 690 is not connected to the UE 680, the eNB 690 may proceed with an RRC connection setup (step S605), and may use a PCell for RRC connection, which will be performed in the same manner as step S405 of FIG. 4 and step S505 of FIG. 5.

[0168] The eNB 690 may allow the UE 680 to use a plurality of CCs based on a performance of hardware of the UE 680, available frequency resources of the eNB 690, and the like, and may define the plurality of CCs to be a CC set. The eNB 690 may transmit CC set information of the UE 680 to the UE 680 (step S610). A CC set information message provided for each UE may be a message used for an RRC (L3) message and the like or may be an L1 signaling or an L2 signaling.

[0169] As described in the foregoing, the UE 680 and the eNB 690 maintain the RRC_CONNECTED mode from step S605 or before. That is, a UL synchronization of a UL CC through which the RRC connection of the UE 680 is set up is maintained. The UE 680 may receive the CC set information determined based on the above condition, from the eNB 690. As one of the schemes of receiving the CC set information, the eNB 690 may include the CC set information in an RRC reconfiguration message for transmission, and other messages may be used for transmission.

[0170] The UE 680 may receive SI of CCs in a set based on the received CC set information (step S620).

[0171] The eNB 690 may set a UL timing group with respect to CCs assigned to the UE 580 (step S624). In the process of configuring the UL timing group in the eNB 690, CCs may be configured to be different groups of at least two or to be the same group. The conditions a-i) through a-v) or b-i) through b-iv) may use to set a UL timing group.

[0172] A method for the eNB 690 to generate a group may include two schemes, that is, a scheme of generating groups by distinguishing CCs that belong to different groups and a scheme of generating a group by distinguishing CCs to be included in the same group. The two schemes may be used together or one of the two schemes may be used. Conditions to be used in a process of applying each scheme have been described in the foregoing.

[0173] The eNB 690 may transmit the UL timing group information to the UE 680 (step S626). The UL timing group information may not be included in the CC set information message and the like for transmission, and The UL timing group information may be transmitted independently with the CC set information through use of a separate message. The UL timing group information may be transmitted through a channel, such as a PDCCH channel, an RRC signaling, and a broadcasting channel, and may be transmitted through an L2 (MAC element control) message.

[0174] The UE 680 that receives the CC set information message may use the received UL timing group as it is, or may slightly change the UL timing group based on a current network state. This may include a case in which the UE 680 changes the UL timing group when the UL timing group generated by the eNB 690 is inappropriate for an environment of the UE 680. After receiving the UL timing group or after changing or newly generating the UL timing group,

the UE 680 may select a delegate CC for each UL timing group (step S634). The conditions taken into consideration when a delegate CC is selected for each UL timing group have been described in step S434 of FIG. 4, and step S534 of FIG. 5.

[0175] After completing selection of a delegate CC for each UL timing group in step S634, when a UL synchronization needs to be obtained, the delegate CC in each group may set an RAP, and may transmit the selected preamble by selecting one of the resources that are allocated for random access and defined in SI of each CC (step S640). The preamble may be sequentially, simultaneously, or randomly selected and transmitted by the UE 680 in time/frequency resources set by the eNB 690. The preamble may be included in a synchronization request message through which the UE requests synchronization.

[0176] The eNB 690 may calculate a TA value for each CC group (each delegate CC) based on the received RAP signal, and may include the corresponding TA value together with UL grant information in RAR information for transmission to UE 680 (step S650). For example, the eNB 690 may calculate a TA value based on the UL timing group set in step S624, and may transmit the calculated TA value in advance. Also, the eNB 690 may transmit the RAR message through a predetermined CC, and may transmit the RAR message through all CCs in the corresponding UL timing group. The TA value may be an example of UL synchronization information required when the UE adjusts a UL transmission time.

[0177] When the UE 680 determines that a TA value received in a CR procedure (step S660) is valid, the UE 680 may apply the TA value to remaining CCs in a group so as to update a TA value for each UL timing group (step S670).

[0178] As described in FIG. 6, the UE 680 may receive a set UL timing group from the eNB 690, and may perform a random access procedure based on a representative value of a

corresponding group. Subsequently, the UE 680 may receive a TA value of the timing group based on a preamble associated with the random access procedure, and may adjust a UL timing for obtaining synchronization.

[0179] FIG. 7 illustrates a process in which an eNB supports the UE to obtain a UL synchronization in response to a request from the UE according to an embodiment of the present invention.

[0180] Referring to FIG. 7, the eNB determines an RRC mode of the UE (step S702). When the RRC mode between the eNB and the UE is an RRC_CONNECTED mode (step S704), the eNB may proceed with step S710.

[0181] When the RRC mode is different from the RRC_CONNECTED mode, the eNB may proceed with step S705. The eNB may determine whether an RRC connection request from the UE exists in step S705. The eNB may receive the RRC connection request from the UE (step S705), and may complete RRC connection (step S706). In this example, the eNB may receive an RRC connection request message from the UE, may transmit an RRC connection setup message, and may receive an RRC connection setup complete message from the UE so as to complete RRC connection. As described in steps S405, S505, and S605, a PCell may be used for RRC connection.

[0182] The eNB may set a CC set including at least one available CC with respect to an RRC_CONNECTED UE, and may transmit CC set information associated with the CC set to the UE (step S710).

[0183] The eNB may transmit SI associated with at least one predetermined CC in the CC set, based on the CC set information of the UE (step S720). Here, the CC set information may be transmitted through an RRC message. Also, the SI of the CC set may be transmitted

through a broadcasting channel.

[0184] The eNB may determine whether a subject of generating a UL timing group is the eNB (step S722). When the UL timing group is generated by the eNB, the eNB may generate a UL timing group based on the CC set information of the UE, and may transmit information
5 associated with the generated UL timing group to the UE (step S726). Here, the UL timing group information may be generated at the same point in time when the CC set information is generated and transmitted in step S710, or may be transmitted together with the CC set information.

[0185] The eNB may receive an RAP from the UE (step S740). The preamble may be included in a synchronization request message through which the UE requests synchronization.
10 Step S740 may include a case in which the subject of generating the UL timing group is the UE. That is, the UE may generate a UL timing group based on available CC set information of step S710 and SI of a corresponding CC of step S720, may set a delegate CC for each timing group, and may transmit an RAP through a corresponding delegate CC. Therefore, the eNB may receive the preamble transmitted from the UE. Here, the eNB may receive a synchronization
15 request message, for example, the preamble, simultaneously through a plurality of delegate CCs, or at separated time, that is, sequentially through a delegate CC for each UL timing group.

[0186] Subsequently, the eNB may transmit an RAR message with respect to the received preamble. In this example, the eNB may transmit UL grant information for the UE and TA information for each UL timing group along with the RAR message (step S750).

20 [0187] The TA value may be an example of UL synchronization information required when the UE adjusts a UL transmission time. Also, the TA information for each UL timing group may be transmitted through a plurality of delegate CCs, simultaneously or at separated time. Here, the TA information for each UL timing group may be transmitted in a form of a

table including a TA value corresponding to a group index. Also, the TA information for each UL timing group may be transmitted in a form including a unit error for each timing group based on a reference TA value. In this example, the error for each group may be expressed by an integer-multiple of a predetermined unit value, or may be specified in detail. The TA information for each UL timing group may be transmitted in a form of an indicator indicating a TA based on a predetermined rule.

[0188] The eNB may transmit a CR message to the UE (step S760). This may include an operation that enables the UE to determine the validity of the received TA value and to update a TA value of a corresponding group.

[0189] FIG. 8 illustrates a process in which a UE obtains a UL synchronization through use of a UL timing group according to an embodiment of the present invention.

[0190] Referring to FIG. 8, the UE may determine an RRC mode (step S802). When the RRC mode is different from an RRC_CONNECTED mode, that is, when the RRC mode is an IDLE mode, the UE may perform RRC connection setup.

[0191] Accordingly, the UE may select a predetermined CC through which RRC connection is performed (step S806), may transmit an RRC connection request message to the selected predetermined CC, may receive an RRC connection setup message from the eNB through the selected predetermined CC, and may transmit an RRC connection setup complete message to the eNB so as to complete RRC connection setup (step S808).

[0192] When the UE corresponds to the RRC_CONNECTED mode (step S804), whether a UL is continuously maintained may be determined (step S810).

[0193] When the UL is not maintained, step S812 may be performed. In step S812, the UE may determine whether an RRC connection setup reconfiguration message is received from

the eNB (step S812).

[0194] Here, when the RRC mode of the UE is the IDLE mode, or when the RRC connection setup reconfiguration is performed, the eNB may have difficulty in defining a CC set and transmitting CC set information. Accordingly, the UE may f-i) select a CC that is most
5 appropriate for attempting RRC connection based on information measured by the UE, or may select at least one CC to perform RRC connection through use of one of f-ii) information fixedly set in a system and stored in an internal memory of the UE, f-iii) information transmitted to the UE from the eNB through SI, or f-iv) SI of available CCs stored in an internal memory of the UE and thus, may form the CC set information. When the mode of the UE is changed to the
10 RRC_CONNECTED mode after completing RRC connection setup, step S830 may be performed.

[0195] When the UE performs handover, the UE may determine the received RRC connection setup reconfiguration message (step S814), and determine mobility control information (MCI) (step S816). The UE may determine information to be used for obtaining
15 synchronization of a corresponding CC from a target eNB (T-eNB), based on the MCI information. That is, the UE may obtain a UL synchronization from the T-eNB. When the UE does not perform handover, the UE may merely determine the received RRC connection setup reconfiguration message (step S814), and may not proceed with steps S816 and S818.

[0196] In other words, when the UE does not perform handover in the process of
20 obtaining a UL synchronization, the UE may proceed with a procedure for obtaining a UL synchronization between a source eNB (S-eNB) and a corresponding CC so as to obtain the UL synchronization. As another example, when the UE performs handover, the UE may proceed with a procedure for obtaining a UL synchronization of a corresponding CC based on SI of a CC

of a T-eNB received from an S-eNB, so as to obtain the UL synchronization. Desirably, a random access procedure may be used, and other procedures may also be applicable.

[0197] Subsequently, to obtain synchronization with the S-eNB or the T-eNB, the UE may select a preamble and may transmit the preamble to the S-eNB or the T-eNB (step S820).

5 The preamble may be included in a synchronization request message through which the UE requests synchronization. The UE may receive an RAR message from the S-eNB or the T-eNB in response to transmission of the preamble. In the RAR message, UL grant information for the UE and TA information for each group including at least one CC to be used for obtaining a UL synchronization may be included (step S822).

10 [0198] The UE may verify whether the TA received through a CR procedure in step S822 is valid (step S824), and the UE may update a UL timing group including at least one CC based on the received TA value (step S826) when the UE determines that the TA is valid.

[0199] When the RRC connection setup reconfiguration message is not received, step S820 may be performed.

15 [0200] When a UL is maintained or when the UE obtains a UL synchronization, the UE may receive CC set information from the eNB (step S830). Also, the UE may receive SI of the received CC set (step S832).

[0201] Subsequently, the UE may determine whether UL timing group information is received (step S840). In this example, when the UL timing group information is generated by the eNB, the UE may receive the UL timing group through the CC set information receiving process or through a separate message. The UL timing group information may include delegate CC information for each group. When the delegate CC information for each group is included in the UL timing group, step S852 may not be performed. When the delegate CC information for

20

each group is not included in the UL timing group, the UE may determine the received UL timing group, and may set a delegate CC for the corresponding UL timing group (step S852).

The delegate CC may be set based on the conditions c-i) through c-v) of FIG. 4. Also, the delegate CC used for adjusting a TA value of each UL timing group may be set by applying the same criterion to all groups, or by applying a different criterion based on a characteristic of each UL timing group.

[0202] When the UL timing group information is not received or when the received timing group is inappropriate for a radio network state where the UE is located or inappropriate for the UE, the UE may set UL timing group information based on the received CC set information (step S850). Also, the UE may set a predetermined CC in the set UL timing group, as a delegate CC for the timing group (step S852).

[0203] The UE may select a preamble and may transmit the preamble through the delegate CC (step S854). This may also be applicable when a TA needs to be updated after the delegate CC is set.

[0204] The UE may receive an RAR message from the eNB. In this example, the UE may receive UL grant information for the UE and the TA information for each UL group (step S856). Here, the UE may determine a TA value in a form of a table corresponding to a group index of each UL timing group. Also, the UE may determine a TA difference value in a form including a unit error for each timing group based on a predetermined reference TA value. Also, the UE may determine an error for each UL timing group that has a size of an integer-multiple of a predetermined unit value, and may also determine an error for each UL timing group that is specified in detail. Also, the UE may determine a TA indicator determined to be an indicator based on a predetermined rule.

[0205] Subsequently, the UE may verify the validity of a TA through a CR procedure (step S860).

[0206] When the UE determines that the TA is valid, the UE may update a TA value for each UL timing group (step S870).

5 [0207] Here, the UE may transmit the updated TA value for each UL timing group to the eNB through a delegate CC. That is, a procedure of determining the TA value may be additionally performed to obtain accurate synchronization with the eNB.

[0208] FIG. 9 illustrates operations of a UE according to an embodiment of the present invention. Here, FIG. 9 shows the operations of the UE when setting of an initial UL timing
10 group is performed in an eNB.

[0209] Referring to FIG. 9, the UE may receive CC set information from the eNB (step S972). The CC set information may be received via a PCC or a Pcell. The PCC may correspond to the PCell as described in the foregoing. A UE in an IDLE mode may select a single DL CC based on the condition described in the foregoing, for RRC connection, and may receive SI
15 through a broadcasting channel transmitted through the selected CC. The CC set information may be transmitted through an RRC message.

[0210] The UE may receive SI associated with CCs in the CC set, based on the received CC set information (step S974). The SI may be transmitted to a plurality of UEs in common through a broadcasting channel or may be transmitted through an RRC message in a form of a
20 dedicated channel. The SI may be transmitted through the PCC. Accordingly, the UE may configure UL CCs in the CC set based on the SI.

[0211] In step S974, the UE may receive an RAP of each CC or information associated with time/frequency resources to be used by the UE, from the eNB. The UE may configure an

initial UL timing group based on the received RAP of each CC or the information associated with the time/frequency resources. The RAP or the information associated with the time/frequency resources may be included in the SI for transmission through the PCC, or may be transmitted in a form of an RRC message.

5 **[0212]** The UE may determine whether simultaneous transmission of the RAP through all UL CCs configured for obtaining a UL synchronization is possible, based on CC parameters and RACH information included in the received SI (step S976).

[0213] Here, the UE may determine a UE-specific RACH parameter from among RACH parameters of the UL CCs configured by the eNB.

10 **[0214]** In this example, when RAP information is set in the UE-specific RACH parameter, the UE may determine the RAP information of the UE and may set an RAP to be transmitted through each of the configured UL CCs. Here, the RAP information may be preamble information set to be different for each UE for distinguishing the UEs.

[0215] When time/frequency resource information is set in the UE-specific RACH
15 parameter, the UE may determine the time/frequency resource information of the UE, and may set an RAP to be transmitted to the configured UL CCs. Here, the time/frequency resource information may be set by the eNB to be different for each UE.

[0216] When simultaneous transmission of the RAP through all the configured UL CCs is possible in step S976, the UE may simultaneously transmit the RAP (step S978).

20 **[0217]** Conversely, when it is determined that the UE is incapable of simultaneously transmitting the RAP through all the UL CCs in step S976, the UE may proceed with step S990.

[0218] With respect to the simultaneous transmission of the RAP, the UE may determine RACH parameters included in SI of each of a plurality of UL CCs, and determine a plurality of

time/frequency resources defined in the RACH parameters, and may select a RAP transmission time (rach_t) for transmitting the RACH at the same time. The RAP transmission time (rach_t) may correspond to a time when the RAPs are simultaneously transmitted by the UE through all the UL CCs.

5 **[0219]** When the UE is incapable of setting the RAP transmission time (rach_t), that is, when the UE is incapable of transmitting the RAP through all the configured UL CC at the same time, the UE may transmit an RAP resource information request message to the eNB (step S990).

10 **[0220]** For example, it is assumed that a time for determining the RACH parameters of all the UL CCs and transmitting RAP is limited to t0 and t1. When the UE determines that transmitting RAP through CC1, CC3, and CCN is allowed at t0, and is not allowed at t1, and the UE determines that transmitting RAP through CC2 is allowed at t1, and is not allowed at t0, the UE may transmit an RAP resource information request message to the eNB.

15 **[0221]** Subsequently, in response to the RAP resource information request, the UE may receive an RAP resource information response message from the eNB (step S992). Here, the eNB that receives the RAP resource information request message may determine that the UE is incapable of simultaneously transmitting the RAP through all the CCs. Therefore, the eNB may include transmission time/frequency resource to be used for RAP transmission of the UE and a type of a preamble in the RAP resource information response message for transmission to the
20 UE.

[0222] Accordingly, the UE may transmit the RAP through all UL CCs configured based on information included in the RAP resource information response message (step S994). When the RAP resource information does not exist in the RAP resource information response message

received from the eNB, a time that is closest to the time when the RAP needs to be transmitted may be selected so that the RAP may be simultaneously transmitted through all the UL CCs. In this example, the same RAP may be selected from all the CCs and may be simultaneously transmitted.

5 **[0223]** Subsequently, the UL timing group information may be received from the eNB through a PCC. That is, the eNB may determine RAPs transmitted from the UE, may determine that the UE requests configuration of a UL timing group, may calculate a TA value based on the preambles received through the RAPs, and may generate the UL timing group of the UE based on the calculated TA. The UL timing group information of the generated UL timing group may
10 be transmitted to the UE.

[0224] The UL timing group information may be received through the PCC (PCell) in a form of a PDCCH or control information of a MAC message, or may be received through an RRC message.

[0225] The UE may simultaneously receive RAR from the eNB through a few or all of
15 DL CCs having linkages with all the configured UL CCs (step S982). The linkage may be set fixedly in a wireless communication system, or may be set for each eNB based on SI, or may be set for each UE or for each UE group based on an RRC message.

[0226] The RAR message may include, for example, identification information of the UE preamble received by the eNB, an identifier (ID) of the eNB, a temporary C-RNTI, information
20 associated with a time slot where the UE preamble is received, UL grant information, TA information for obtaining a UL synchronization, and the like.

[0227] Accordingly, the UE may transmit data through a PUSCH through use of time/frequency resource information included in the UL grant information at a scheduled time

determined based on the received TA information, and may perform HARQ.

[0228] The UE may simultaneously verify the validity of the TA with respect to CCs through which the RAR is received (step S984). In this example, when RAP information is set in the UE-specific RACH parameter, the UE may omit verifying the validity of the TA.

5 [0229] As described in the foregoing, the UE may determine whether C-RNTI, T_C-RNTI, or UE identity included in an ACK message received from the eNB is identical to C-RNTI, T_C-RNTI, or UE identity assigned to the UE, so as to simultaneously verify the validity of the TA. Here, the UE may transmit an L2/L3 message including the C-RNTI, the T_C-RNTI, or the UE identity to the eNB, and may receive an L1/L2 message from the eNB since the ACK
10 message is based on the HARQ operation.

[0230] The UE may recognize that the eNB sets UL CCs having linkages with the received DL CC through which the RAR is received as delegate CCs in a group, and may set the UL CCs as the delegate CCs in the group (step S986).

[0231] The UE may apply a TA value of the delegate CC received in step S972 to
15 remaining CCs in each group for updating (step S988).

[0232] FIG. 10 illustrates a configuration of a transmitting apparatus according to an embodiment of the present invention.

[0233] Referring to FIG. 10, a transmitting apparatus 1000 may include a connection mode determining unit 1005 to determine an RRC mode of a UE, a CC set determining unit 1020
20 to determine a CC set including at least one CC available to the UE, a UL timing group generating unit 1030 to generate a UL timing group, a transceiving unit 1050, and a controller 1010 to control the above component elements.

[0234] The controller 1010 may generate UL synchronization information corresponding

to the UL timing group, so as to establish a UL synchronization. The transceiving unit 1050 may receive a synchronization request message from the UE through at least one delegate CC in the UL timing group, and may transmit the UL synchronization information to the UE through the at least one delegate CC. The at least one delegate CC may be selected by the UE based on a state
5 of the UL timing group and characteristics of a plurality of CCs forming the UL timing group, so as to obtain the UL synchronization. In particular, the at least one delegate CC may correspond to at least one of c-i) through c-v). The CC may be included in the serving cell as described in the foregoing.

[0235] In particular, the RRC mode determining unit 1005 may determine a connection
10 mode between the UE and the eNB, and when the UE and the eNB are not connected, that is, when the connection mode is an RRC_IDLE mode or UL synchronization is not established, the RRC mode determining unit 1005 may change the connection mode of the UE to an RRC_CONNECTED mode or may enable the UL synchronization to be established. In this example, RRC connection setup may be performed through use of the UE and a PCC as
15 described in the foregoing.

[0236] For example, the RRC mode determining unit 1005 may operate the transceiving unit 1050 to receive an RRC connection request transmitted from the UE, and to transmit an RRC connection setup message to the UE. Also, the RRC mode determining unit 1005 may receive an RRC connection setup complete message from the UE, may complete the RRC
20 connection setup, and may determine an UE RRC_CONNECTED mode.

[0237] The CC set determining unit 1020 may determine at least one CC available to the UE, and may set a CC set of the UE. In this example, the CC set for the UE may be set based on a difference in UL synchronization times of the available (configurable) CCs, type information

of each CC, a center frequency location of each CC, a service type of each CC, a network service for each CC, and the like.

[0238] The controller 1010 may set the CC set determined by the CC set determining unit 1020 as a CC set to be used by the UE, and the transceiving unit 1050 may transmit information associated with the set CC set to the UE through a PCell or a primary CC, before receiving the synchronization request message.

[0239] The UL timing group generating unit 1030 may generate the UL timing group of the UE based on the CC set determined by the CC set determining unit 1020. Here, the UL timing group may be generated to satisfy at least one of the conditions a-i) through a-v) or b-i) through b-iv), and may be determined by comparing a difference in center frequency values of CCs with a threshold, determining whether the CCs have the same beamforming scheme or different beamforming schemes, determining whether the CCs are updated in response to a UL synchronization update request, or determining whether the CCs correspond to CCs that are incapable of providing services in a macrocell but are capable of providing services in a space superposed by a cell smaller than the macrocell, such as a femtocell, a picocell, a micorcell, a relay, a repeater, and the like.

[0240] The transceiving unit 1050 may transmit the CC set information and UL timing group information to the UE. In this example, the transceiving unit 1050 may transmit the UL timing group information together with the CC set information as shown in FIG. 5, or may transmit the UL timing group information and the CC set information separately as shown in FIG. 6. Also, the transceiving unit 1050 may additionally transmit SI after transmitting the CC set information. Therefore, the UE may be able to configure the UL timing group based on the CC set information and the SI.

[0241] The transceiving unit 1050 may receive, from the UE, the synchronization request message requesting synchronization, for example, a message including an RAP. That is, the RAP transmitted through the delegate CC determined by the UE for the UL timing group may be determined, and a TA value for each UL timing group may be transmitted. The synchronization request message may be received through at least one delegate CC, simultaneously or sequentially at separated time.

[0242] The transceiving unit 1050 may change a portion or all of the UL timing group determined by the UL timing group generating unit 1030, based on the RAP message transmitted from the UE.

[0243] The controller 1010 may control the transceiving unit 1050 to generate information associated with synchronization based on the received RAP, for example, a message including UL grant information, TA information associated with the synchronization, and the like, and to transmit the generated information to the UE. In this example, the message including the TA information may include an RAR message. The information associated with the synchronization may include TA information required to move up a UL transmission time. Therefore, the controller 1010 may control the transceiving unit 1050 to generate and transmit synchronization information with respect to the UL timing group.

[0244] Here, the controller 1010 may generate TA information for each UL timing group in a form of a table including a TA value corresponding to a group index, in a form of a TA value including a unit error for each timing group. The error for each timing group may have a size of an integer-multiple of a predetermined unit value, or may be specified in detail. Also, the controller 1010 may control the transceiving unit 1050 to transmit the TA information for each UL timing group as an indicator indicating a TA based on a predetermined rule. The TA value

may be an example of the UL synchronization information required when the UE adjusts a UL transmission time, and the synchronization information for the UL timing group may be transmitted through one or more delegate CCs, simultaneously or at separated time.

[0245] The UL synchronization information, as described in the foregoing, may be calculated by comparing, with a predetermined threshold, a difference in center frequency values of a plurality of CCs in the CC set configured for the UE, or may be calculated to enable the CCs to have different transmission times by determining whether the CCs correspond to CCs having the same beamforming scheme, correspond to CCs updated in response to a synchronization update request, or correspond to CCs that do not provide services in a macrocell but provide services in a space superposed by a coverage cell smaller than the macrocell.

[0246] Also, the controller 1010 may control all component elements, and a few component elements may independently operate. The component elements of FIG. 10 may be configured as a single module or two or more modules, or may be configured to perform a single function in two or more modules.

[0247] FIG. 11 illustrates a configuration of a receiving apparatus according to an embodiment of the present invention.

[0248] Referring to FIG. 11, a receiving apparatus 1110 may include a connection mode determining unit 1105, a CC set determining unit 1107, a controller 1110, a UL timing adjusting unit 1120, a UL timing group generating unit 1130, and a transceiving unit 1150.

[0249] The transceiving unit 1150 may transmit a synchronization request message to an eNB through one or more CCs in a UL timing group, and may receive UL synchronization information through the one or more CCs. The controller 1110 may control the transceiving unit. The controller 1110 may determine the UL synchronization information received through

the transceiving unit. The UL timing adjusting unit 1120 may establish a UL synchronization of the UL timing group based on the UL synchronization information determined by the controller. That is, the UL timing adjusting unit 1120 may establish the UL synchronization of the UL timing group based on the UL synchronization information received through the transceiving unit. Here, the controller 1110 may determine UL grant information and a TA value calculated to adjust a UL transmission time for each group corresponding to the UL timing group, through an RAR message received in response to the synchronization request message transmitted through the transceiving unit. The UL timing adjusting unit 1120 may establish a UL synchronization based on the UL synchronization information determined by the controller. In this example, the UL timing adjusting unit 1120 may establish the UL synchronization based on a TA value distinguished based on the UL timing group, based on a unit error distinguished based on the UL timing group, or based on an error distinguished based on the UL timing group and having a size of an integer-multiple of a determined unit value, or using an indicator associated with a rule determined based on the UL timing group. The UL synchronization information may be distinguished based on a group index of the UL timing group.

[0250] Here, the one or more delegate CCs may be selected by the UE based on a state of the UL timing group and characteristics of a plurality of CCs forming the UL timing group, so as to obtain the UL synchronization. In particular, the one or more delegate CCs may correspond to at least one of c-i) through c-v). The CCs may be included in a serving cell as described in the foregoing.

[0251] In particular, the connection mode determining unit 1105 may determine a connection mode with the eNB. That is, when the connection mode is an UE RRC_IDLE mode or UL synchronization with the eNB is not established, the connection mode determining unit

1105 may enable the UE to change the connection mode to an RRC_CONNECTED mode or enable the UL synchronization to be established. In this example, RRC connection setup may be performed through use of the UE and a PCC as described in the foregoing.

[0252] For example, the connection mode determining unit 1005 may transmit an RRC connection request message to the eNB through use of the transceiving unit 1050, may receive an RRC connection setup message from the eNB, and may complete RRC connection setup through use of an RRC connection setup complete message.

[0253] The transceiving unit 1150 may perform transmission and reception of information with the eNB. For example, the transceiving unit 1150 may receive CC set information and information associated with synchronization from the eNB. In particular, the transceiving unit 1150 may receive the CC set information from the eNB through a PCell or a primary CC, before transmitting the synchronization request message. After receiving the CC set information, the transceiving unit 1150 may receive SI associated with the CCs in the CC set, from the eNB. The SI may include frequency band information of a CC, information associated with an available frequency magnitude, and the like.

[0254] The CC set determining unit 1107 may determine at least one CC available to the UE, from the CC set information. The CC set may be determined based on a difference in UL synchronization times of the CCs available to the UE, type information of each CC, a center frequency location of each CC, a service type of each CC, a network service for each CC, and the like.

[0255] The UL timing group generating unit 1130 may generate a UL timing group of the UE based on the CC set determined by the CC set determining unit 920. Here, the UL timing group may be configured by the UE based on the conditions described in FIG. 10 (at least one of

conditions a-i) through a-v) or b-I through b-iv)). Also, the UL timing group generating unit 1130 may select a delegate CC of the UL timing group.

[0256] For example, when the UL timing group generating unit 1130 receives, from the eNB, UL timing group information of CCs together with the CC set information, the UL timing group generating unit 1130 may select a delegate CC from the received UL timing group. Also, the UL timing group generating unit 1130 may receive, through the transceiving unit 1150, the UL timing group information separately from the CC set information, through a separate signaling.

[0257] Therefore, when the transceiving unit 1150 does not receive the UL timing group information of CCs or the UL timing group information generated by the eNB is inappropriate for a network state of the UE, the UL timing group generating unit 1130 may configure a new UL timing group.

[0258] Also, the controller 1110 may control the transceiving unit 1150 to transmit a synchronization request message requesting synchronization to the eNB through the delegate CC, and to receive information associated with synchronization from the eNB through the delegate CC.

[0259] For example, the controller 1110 may control the transceiving unit 1150 to transmit a message including a RAP selected by the UE, and to receive an RAR message transmitted from the eNB. Also, the controller 1110 may control the transceiving unit 1150 to perform, with the eNB, transmission and reception of a message for RRC reconfiguration and synchronization. The synchronization request message may be transmitted through one or more delegate CCs simultaneously or at separated time.

[0260] Also, the controller 1110 may control the UL timing group generating unit 930 to

change a portion or all of the determined UL timing group, based on the RAR message.

[0261] In particular, the controller 1110 may perform controlling so as to determine a TA value associated with each UL timing group based on the set UL timing group included in the RAR message. Also, the controller 1110 may perform controlling so as to determine frequency resource information assigned for UL transmission of the UE.

[0262] The UL timing adjusting unit 1120 may determine the TA value determined by the controller 1110, and may apply the TA value to all CCs of the corresponding UL timing group where the delegate CC is included. That is, the TA value may be applied to the corresponding UL timing group for synchronization with the eNB. Here, TA information for each UL timing group may be in a form of a table including a TA value corresponding to a group index, in a form of a TA value including a unit error for each timing group, in a form of an error having a size of an integer-multiple of a predetermined unit value, for each timing group, in a form of an error specified in detail for each timing group, or in a form of an indicator indicating a TA based on a predetermined rule. Therefore, the UL timing adjusting unit 1120 may obtain synchronization by applying a determined TA to each UL timing group. The TA value may be an example of UL synchronization information required when the UE adjusts a UL transmission time, and the synchronization information for the UL timing group may be received through one or more delegate CCs simultaneously or at separated time.

[0263] For example, when the TA information is included in the synchronization information, the TA information may be set equally to all CCs in the UL timing group.

[0264] As described in the foregoing, the controller 1110 may control all component elements, and a few component elements may independently operate. The component elements of FIG. 11 may be configured as a single module or two or more modules, and may be

configured to perform a single function in two or more modules.

[0265] Based on the descriptions of FIG. 9, the transceiving unit 1150 may receive SI of CCs in the CC set based on the CC set information, and the controller 1110 may control the transceiving unit 1105 to simultaneously transmit the synchronization request message to the eNB through all UL CCs in the CC set, based on the received SI.

[0266] Subsequently, the transceiving unit 1105 may receive UL timing group information from the eNB, and simultaneously receive UL synchronization information through a few or all of DL CCs associated with the received UL timing group, and the controller 1110 may set a UL CC associated with a CC through which the UL synchronization information is received as a delegate CC of the received UL timing group.

[0267] Therefore, according to an embodiment of the present invention, when a plurality of CCs is used, a different UL synchronization may be obtained for each CC or for each CC group and thus, when the UE transmits information in a UL through a plurality of CCs, data transmission error due to an error in obtaining synchronization and delay in receiving information in the eNB may be effectively reduced.

[0268] Also, when a UL synchronization standard is different for each of the plurality of CCs, the UE may obtain a UL synchronization based on a type of each CC, a center frequency location, and a service type.

WHAT IS CLAIMED IS:

1 1. A communication method for a user equipment (UE) comprising:
2 receiving, at the UE, a Radio Resource Control (RRC) message through a primary
3 Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing
4 group, the RRC message comprises information related to a second UL timing group,
5 which has been set by an evolved Node B (eNB), the second UL timing group includes a
6 secondary CC;
7 receiving, at the UE, information indicating a random access preamble;
8 transmitting, at the UE, the random access preamble according to a non-
9 contention selection, through one or more CCs, each of the one or more CCs
10 transmitting the random access preamble being set as a delegate CC for a respective
11 second UL timing group;
12 receiving, at the UE, a random access response through the primary CC, the
13 random access response includes a Timing Advanced (TA) value that is calculated to
14 adjust a UL transmission time for the second UL timing group in response to the
15 transmitted the random access preamble, together with UL grant information for the UE,
16 wherein each TA value is transmitted from the eNB for the respective second UL timing
17 group based on the transmitted random access preamble associated with the delegate CC
18 of the respective second UL timing group; and
19 applying each TA value to the secondary CC for the respective second UL timing
20 group.

1 2. The method of claim 1, wherein the one or more delegate CCs correspond to at
2 least one of i) a CC having a lowest center frequency value, ii) a CC having a center
3 frequency value that is closest to a mean value, iii) a CC having a highest center
4 frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be
5 used for monitoring downlink (DL) quality, from among a plurality of CCs forming the
6 second UL timing group; and the CC is included in one or more serving cells.

1 3. The method of claim 1, wherein the second UL timing group is configured of
2 i) at least one CC having a difference in a center frequency value within a threshold
3 range, ii) at least one CC to which a same beamforming scheme is applied, iii) at least
4 one CC used in devices in a same radio network, or iv) at least one CC that does not
5 belong to another second UL timing group, from among a plurality of CCs; and the
6 second UL timing group is generated by the UE or the eNB.

1 4. The method of claim 1, wherein the random access response is configured to
2 include the TA value distinguished based on the second UL timing group, to include a
3 unit error distinguished based on the second UL timing group, or to include an error
4 distinguished based on the second UL timing group and having a size of an integer-
5 multiple of a predetermined unit value, or is configured as an indicator associated with a
6 rule determined based on the second UL timing group, and the random access response is
7 distinguished based on a group index of the second UL timing group.

1 5. A communication apparatus for a user equipment (UE) comprising:

2 a memory; and
3 a processor operably coupled to the memory;
4 wherein the processor, when executing program instructions stored in the
5 memory, is configured to:
6 cause the apparatus to receive a Radio Resource Control (RRC) message through
7 a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink
8 (UL) timing group, the RRC message comprises information related to a second UL
9 timing group, which has been set by an evolved Node B(eNB), the second UL timing
10 group includes a secondary CC;
11 cause the apparatus to receive information indicating a random access preamble;
12 cause the apparatus to transmit the random access preamble according to a non-
13 contention selection, through one or more UL CCs, each of the one or more UL CCs
14 transmitting the random access preamble being set as a delegate CC for a respective
15 second UL timing group;
16 cause the apparatus to receive a random access response through the primary CC,
17 the random access response includes a Timing Advanced(TA) value that is calculated to
18 adjust a UL transmission time for the second UL timing group in response to the
19 transmitted the random access preamble, together with UL grant information for the UE,
20 wherein each TA value is transmitted from the eNB for the respective second UL timing
21 group based on the transmitted random access preamble associated with the delegate CC
22 of the respective second UL timing group; and
23 cause the apparatus to apply each TA value to the secondary CC for the
24 respective second UL timing group.

1 6. The UE of claim 5, wherein the one or more delegate CCs correspond to at
2 least one of i) a CC having a lowest center frequency value, ii) a CC having a center
3 frequency value that is closest to a mean value, iii) a CC having a highest center
4 frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be
5 used for monitoring downlink (DL) quality, from among a plurality of CCs forming the
6 second UL timing group; and the CC is included in one or more serving cells.

1 7. The UE of claim 5, wherein the second UL timing group is configured of i) at
2 least one CC having a difference in a center frequency value within a threshold range, ii)
3 at least one CC to which a same beamforming scheme is applied, iii) at least one CC used
4 in devices in a same radio network, or iv) at least one CC that does not belong to another
5 second UL timing group, from among a plurality of CCs; and the second UL timing
6 group is generated by the UE or the eNB.

1 8. The UE of claim 5, wherein the random access response is configured to
2 include the TA value distinguished based on the second UL timing group, to include a
3 unit error distinguished based on the second UL timing group, or to include an error
4 distinguished based on the second UL timing group and having a size of an integer-
5 multiple of a predetermined unit value, or is configured as an indicator associated with a
6 rule determined based on the second UL timing group, and the random access response is
7 distinguished based on a group index of the second UL timing group.

1 9. A communication method for an evolved Node-B (eNB) comprising:
2 transmitting, to a user equipment (UE), a Radio Resource Control (RRC)
3 message through a primary Component Carrier (CC), wherein the primary CC belongs to
4 a first uplink (UL) timing group, the RRC message comprises information related to a
5 second UL timing group, the second UL timing group includes a secondary CC;
6 transmitting, to the UE, information indicating a random access preamble;
7 receiving, from the UE, the random access preamble according to a non-
8 contention selection, through one or more UL CCs, each of the one or more UL CCs
9 transmitting the random access preamble being set as a delegate CC for a respective
10 second UL timing group; and
11 transmitting, to the UE, a random access response through the primary CC, the
12 random access response includes a Timing Advanced (TA) value to adjust a UL
13 transmission time for the second UL timing group in response to the transmitted the
14 random access preamble, together with UL grant information for the UE,
15 wherein each TA value is calculated by the eNB for the respective second UL
16 timing group based on the received random access preamble associated with the delegate
17 CC of the respective second UL timing group, and
18 wherein the TA value is configured to be applied to the secondary CC for
19 respective second UL timing group.

1 10. The method of claim 9, wherein the one or more delegate CCs correspond to
2 at least one of i) a CC having a lowest center frequency value, ii) a CC having a center
3 frequency value that is closest to a mean value, iii) a CC having a highest center

4 frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be
5 used for monitoring downlink (DL) quality, from among a plurality of CCs forming the
6 second UL timing group; and the CC is included in one or more serving cells.

1 11. The method of claim 9, wherein the second UL timing group is configured of
2 i) at least one CC having a difference in a center frequency value within a threshold
3 range, ii) at least one CC to which a same beamforming scheme is applied, iii) at least
4 one CC used in devices in a same radio network, or iv) at least one CC that does not
5 belong to another second UL timing group, from among a plurality of CCs; and the
6 second UL timing group is generated by the UE or the eNB.

1 12. The method of claim 9, wherein the random access response is configured to
2 include the TA value distinguished based on the second UL timing group, to include a
3 unit error distinguished based on the second UL timing group, or to include an error
4 distinguished based on the second UL timing group and having a size of an integer-
5 multiple of a predetermined unit value, or is configured as an indicator associated with a
6 rule determined based on the second UL timing group; and the random access response is
7 distinguished based on a group index of the second UL timing group.

1 13. A communication apparatus for an evolved Node-B (eNB) comprising:
2 a memory; and
3 a processor operably coupled to the memory;

4 wherein the processor, when executing program instructions stored in the
5 memory, is configured to:

6 cause the apparatus to transmit, to a user equipment (UE), a Radio Resource
7 Control (RRC) message through a primary Component Carrier (CC), wherein the primary
8 CC belongs to a first uplink (UL) timing group, the RRC message comprises information
9 related to a second UL timing group, the second UL timing group includes a secondary
10 CC;

11 cause the apparatus to transmit, to the UE, information indicating a random
12 access preamble;

13 cause the apparatus to receive, from the UE, the random access preamble
14 according to a non-contention selection, through one or more UL CCs, each of the one or
15 more UL CCs transmitting the random access preamble being set as a delegate CC for a
16 respective second UL timing group; and

17 cause the apparatus to transmit, to the UE, a random access response through the
18 primary CC, the random access response includes a Timing Advanced (TA) value to
19 adjust a UL transmission time for the second UL timing group in response to the received
20 the random access preamble, together with UL grant information for the UE,

21 wherein each TA value is calculated by the eNB for the respective second UL
22 timing group based on the received random access preamble associated with the delegate
23 CC of the respective second UL timing group, and

24 wherein the TA value is configured to be applied to the secondary CC for
25 respective second UL timing group.

1 14. The eNB of claim 13, wherein the one or more delegate CCs correspond to at
2 least one of i) a CC having a lowest center frequency value, ii) a CC having a center
3 frequency value that is closest to a mean value, iii) a CC having a highest center
4 frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be
5 used for monitoring downlink (DL) quality, from among the plurality of CCs forming the
6 second UL timing group; and the CC is included in one or more serving cells.

1 15. The eNB of claim 13, wherein the second UL timing group is configured of i)
2 at least one CC having a difference in a center frequency value within a threshold range,
3 ii) at least one CC to which a same beamforming scheme is applied, iii) at least one CC
4 used in devices in a same radio network, or iv) at least one CC that does not belong to
5 another UL timing group, from among the plurality of CCs; and the second UL timing
6 group is generated by the UE or the eNB.

1 16. The eNB of claim 13, wherein the random access response is configured to
2 include the TA value distinguished based on the second UL timing group, to include a
3 unit error distinguished based on the second UL timing group, or to include an error
4 distinguished based on the second UL timing group and having a size of an integer-
5 multiple of a predetermined unit value, or is configured as an indicator associated with a
6 rule determined based on the second UL timing group; and the random access response is
7 distinguished based on a group index of the second UL timing group.

ABSTRACT

Uplink synchronization establishment in a base station which operates a plurality of component carriers according to one embodiment of the present description, is performed in that the base station is connected to a user equipment, sets component carrier aggregation information, generates an uplink timing groups in the set component carrier aggregation, and transmits information on the thus-generated uplink timing groups to the user equipment.

FIG. 1

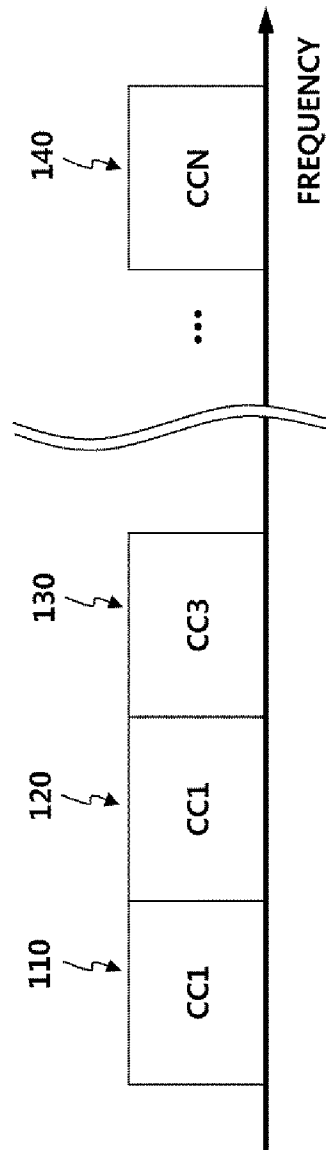


FIG. 2

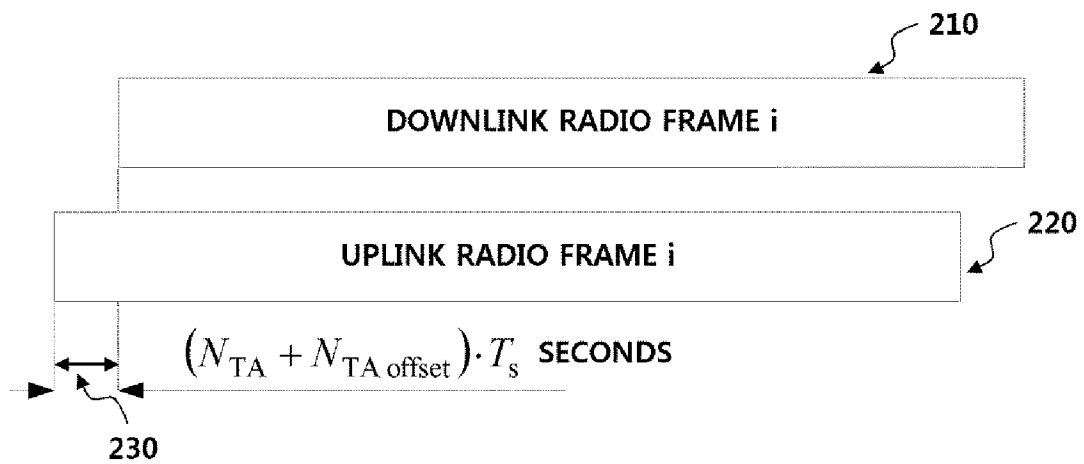


FIG.3

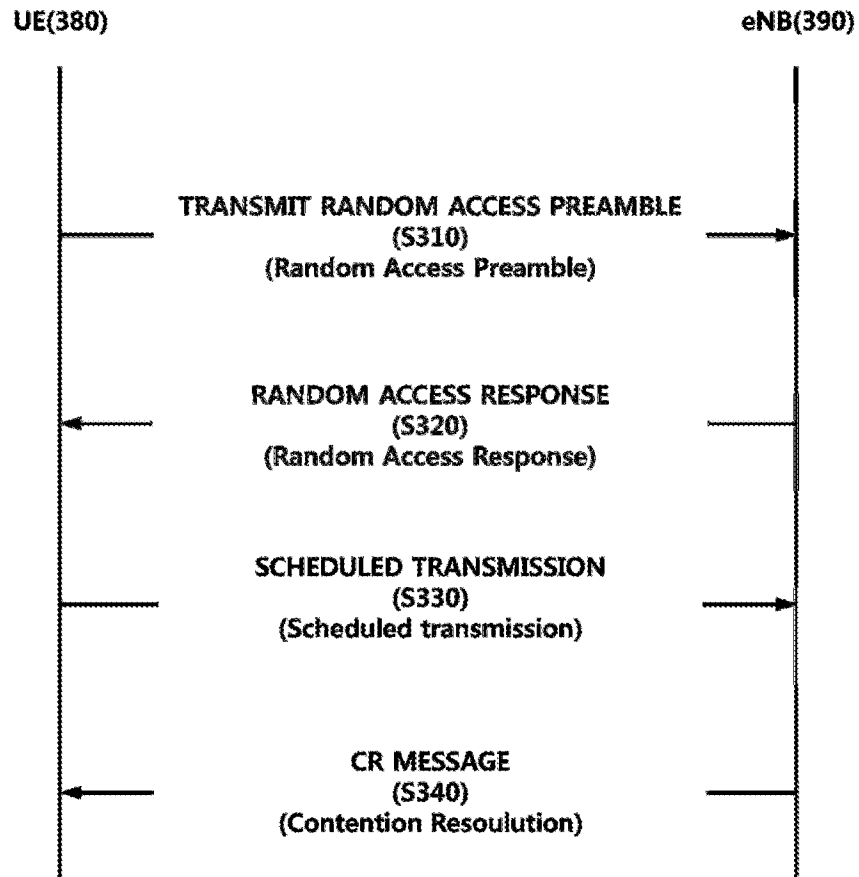


FIG. 4

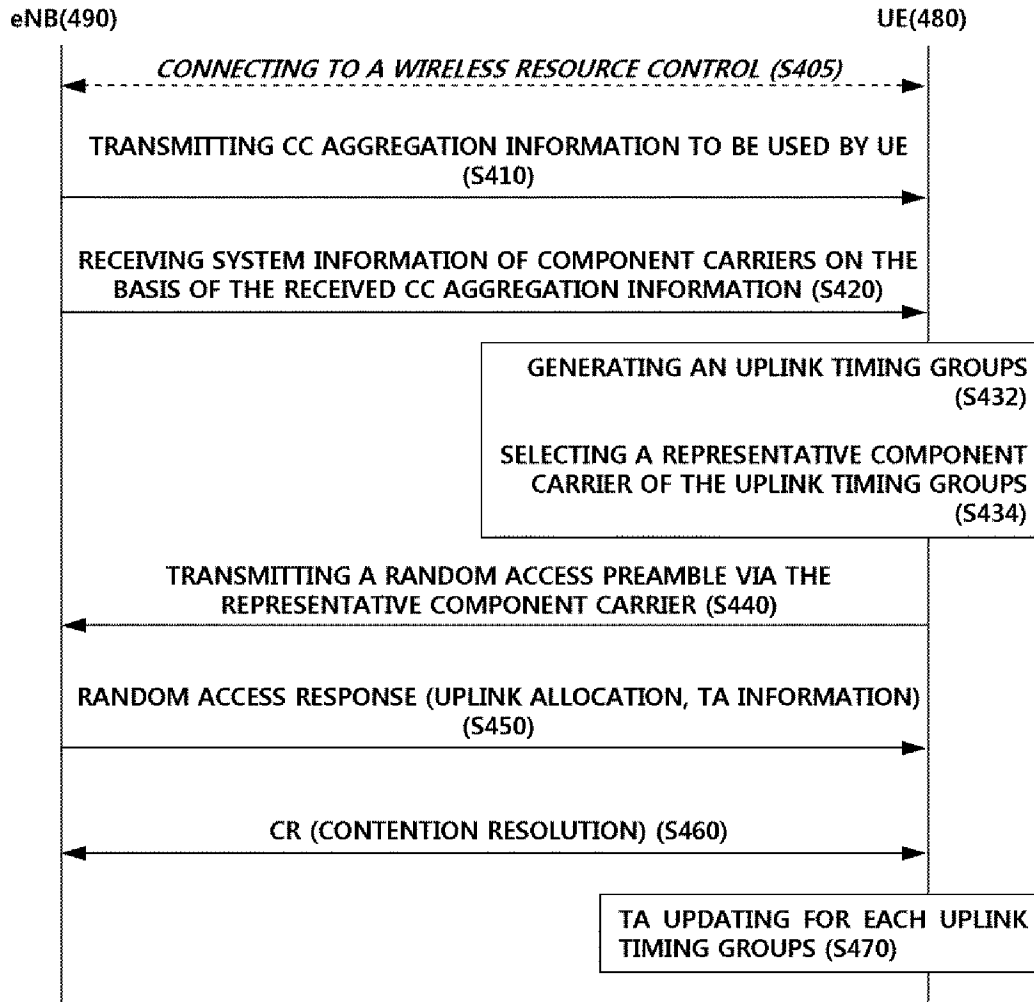


FIG.5

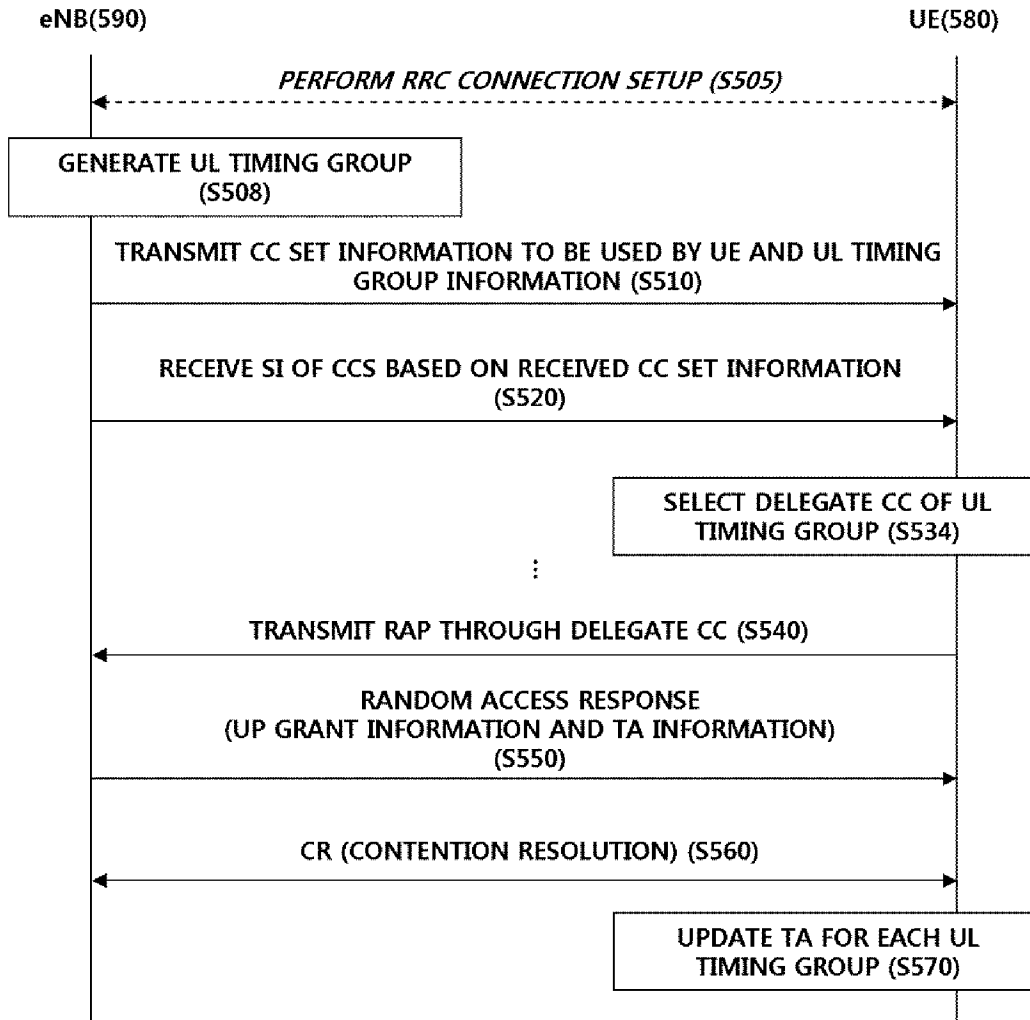


FIG. 6

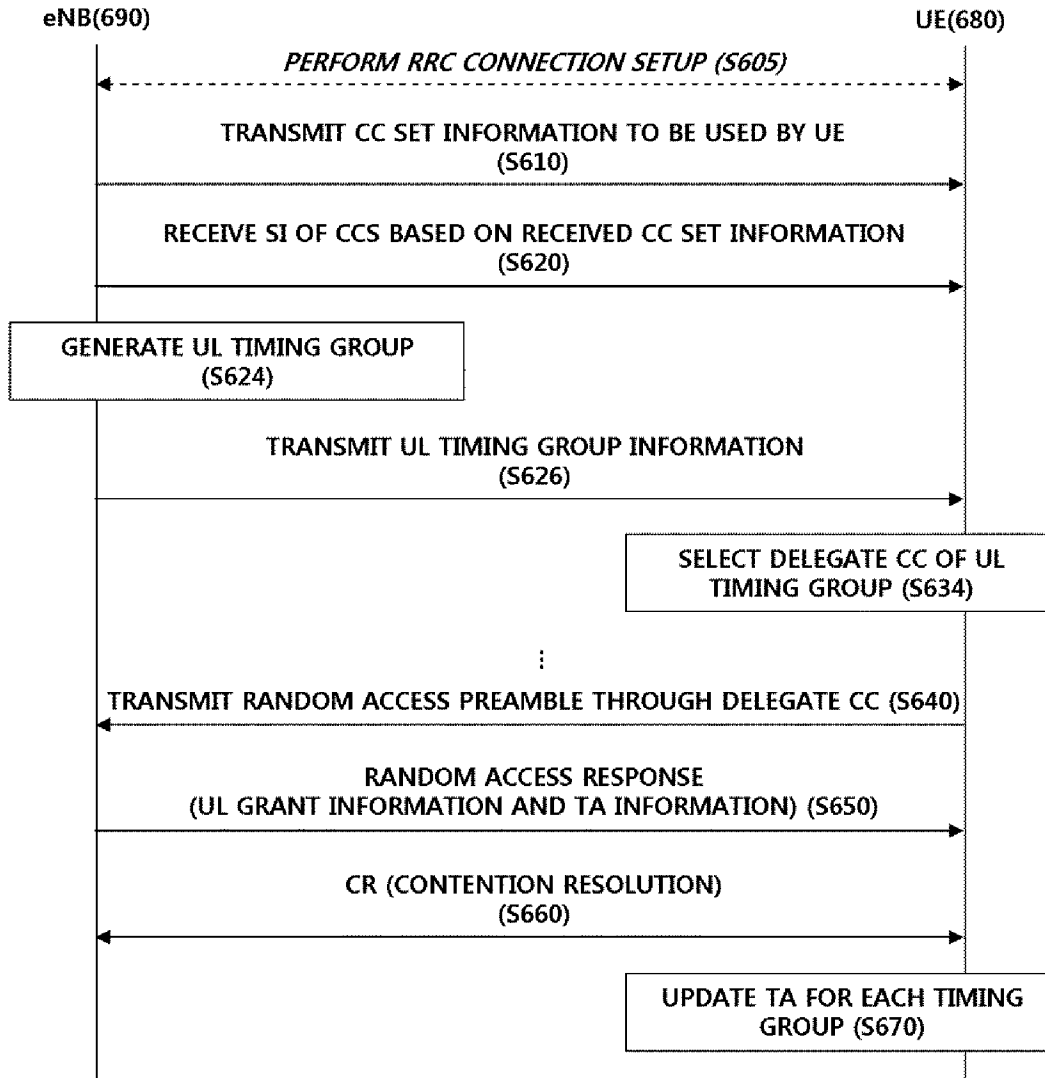


FIG. 7

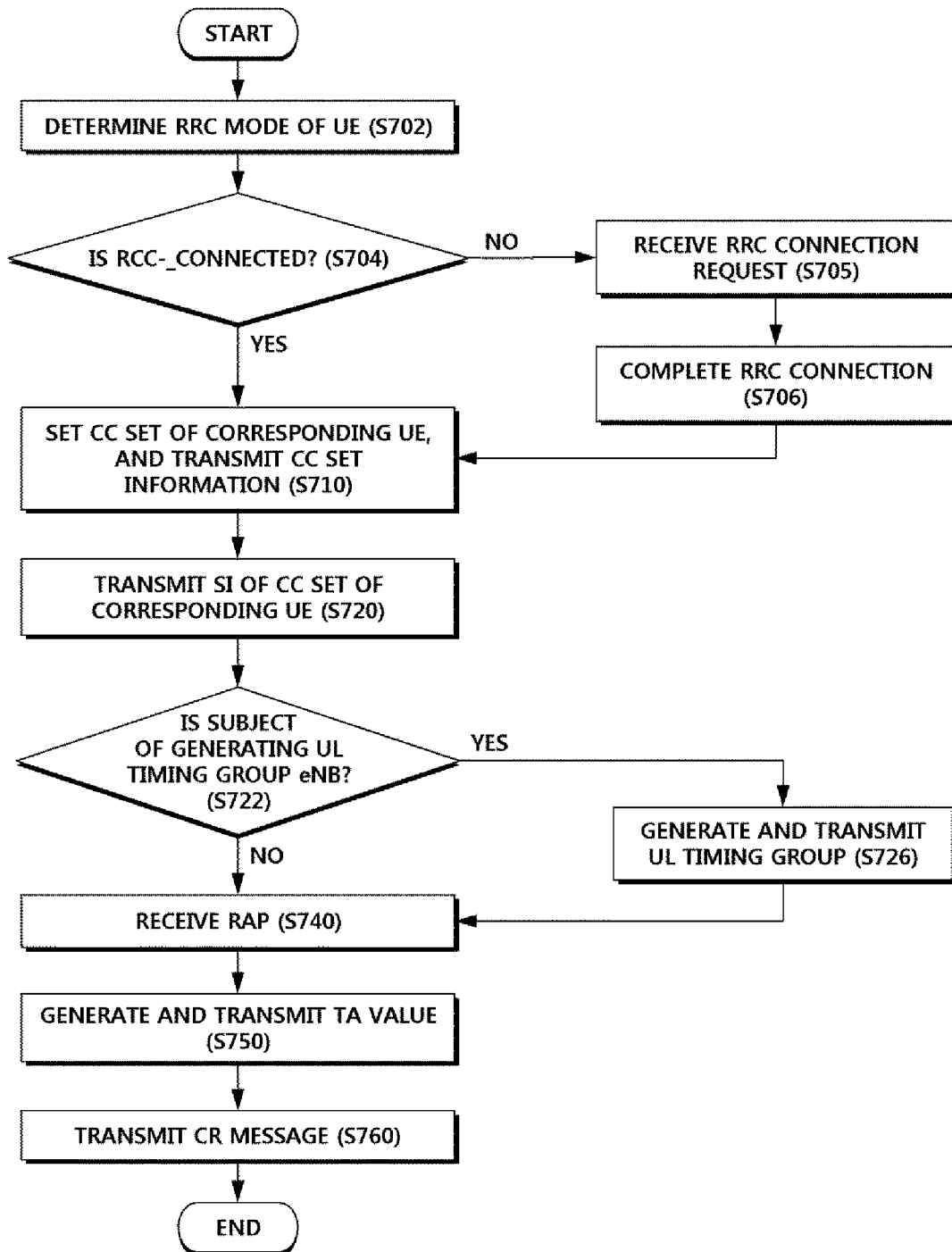


FIG. 8

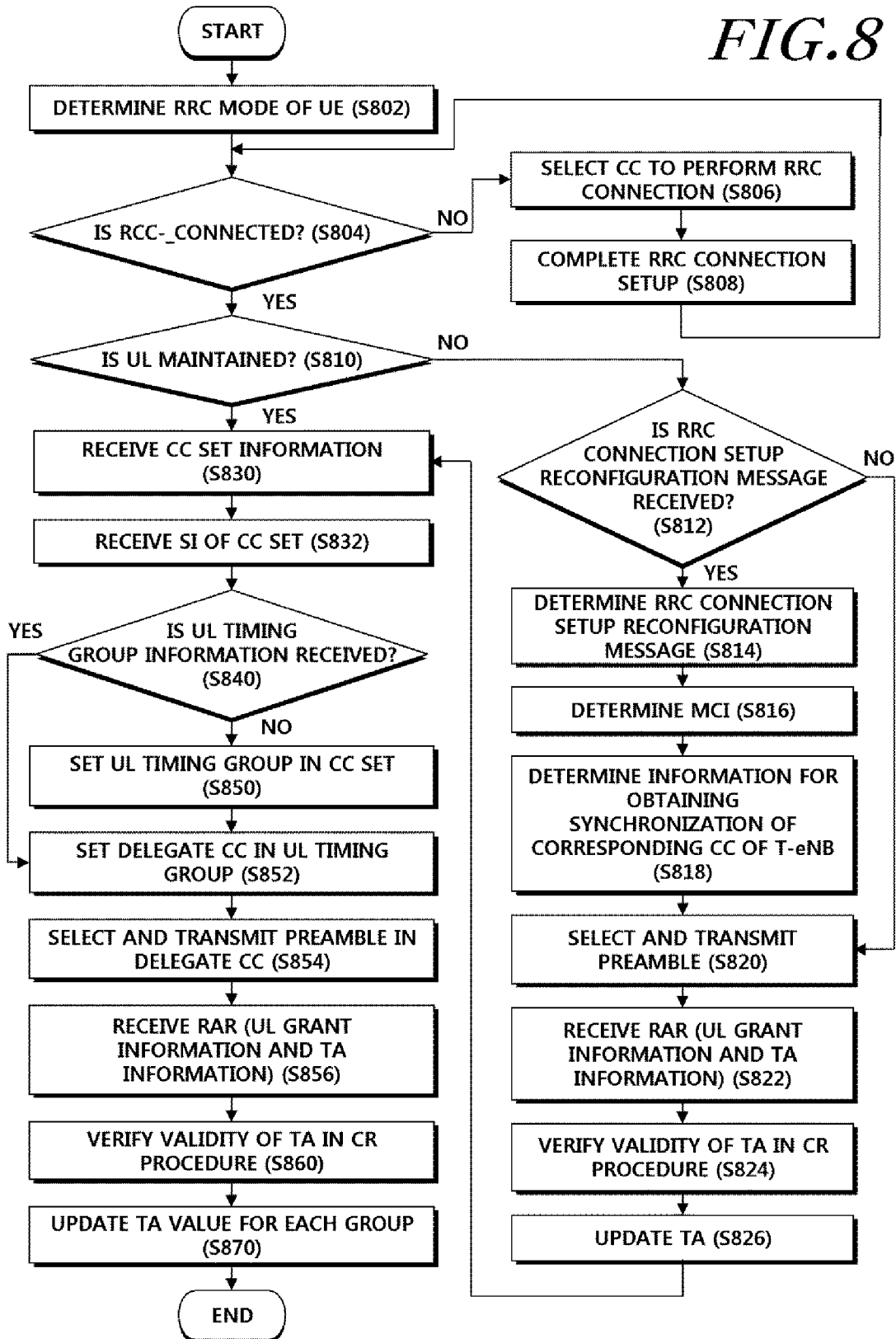


FIG. 9

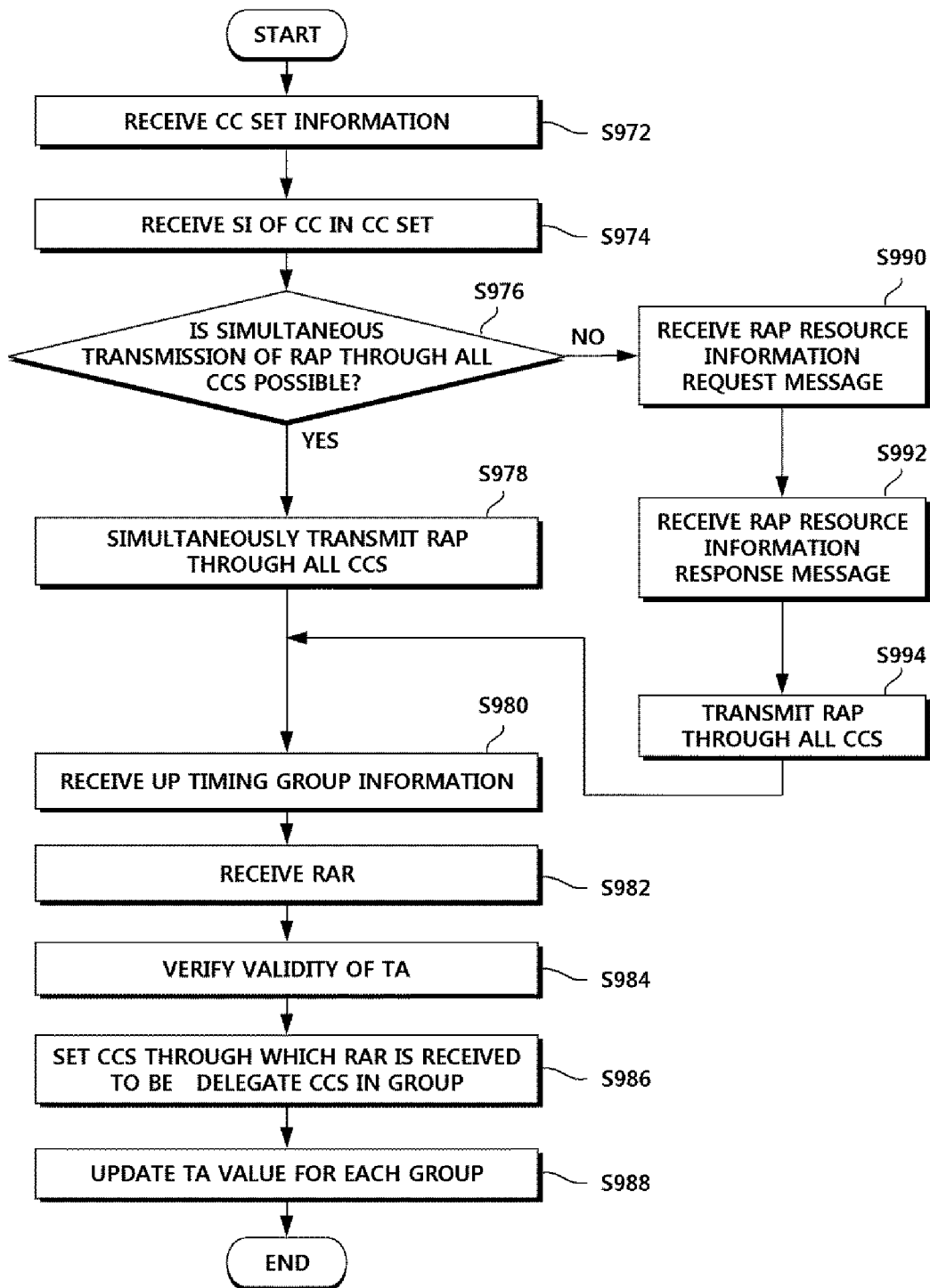


FIG. 10

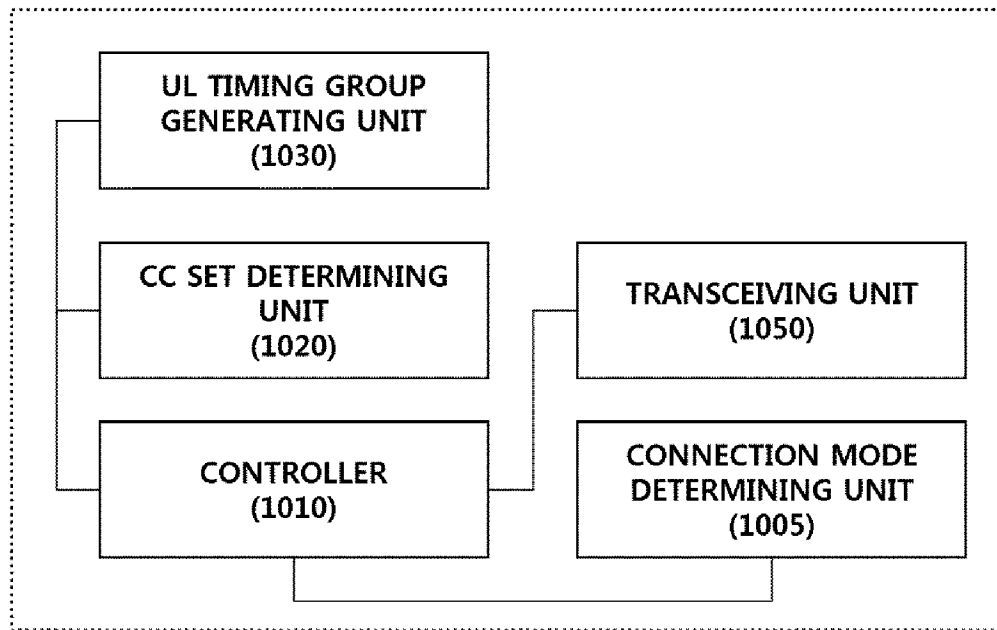
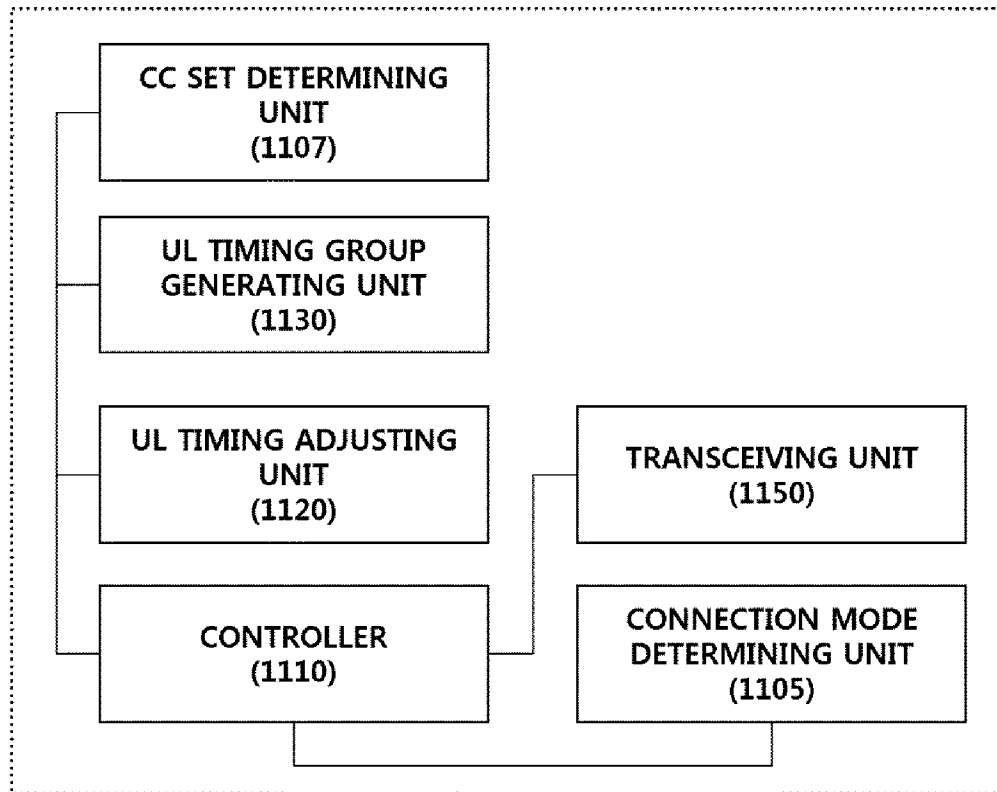


FIG. 11



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor 1					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Kibum		KWON		
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service					
City	Seoul	Country of Residence ⁱ	KR		
Mailing Address of Inventor:					
Address 1		Pantech Bldg., 1-2, DMC Sangam-dong, Mapo-gu			
Address 2					
City	Seoul	State/Province			
Postal Code	121-270	Country ⁱ	KR		
Inventor 2					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Myungcheul		JUNG		
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service					
City	Seoul	Country of Residence ⁱ	KR		
Mailing Address of Inventor:					
Address 1		Pantech Bldg., 1-2, DMC Sangam-dong, Mapo-gu			
Address 2					
City	Seoul	State/Province			
Postal Code	121-270	Country ⁱ	KR		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					

Correspondence Information:

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ An Address is being provided for the correspondence information of this application.

Customer Number	167455		
Email Address	patent@capitolilaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		
Attorney Docket Number	PPA0010USC1	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	11	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	167455		

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	16733106	2020-01-02		
Prior Application Status	Abandoned	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
16733106	Continuation of	15820980	2017-11-22		
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
15820980	Continuation of	14733068	2015-06-08	9854545	2017-12-26
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14733068	Continuation of	13578531	2012-08-10	9054835	2015-06-09
Prior Application Status	Pending	Remove			
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
13578531	a 371 of international	PCT/KR2011/000909	2011-02-10		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove Access Code ⁱ (if applicable)
10-2011-0008683	KR	2011-01-28	
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove Access Code ⁱ (if applicable)
10-2010-0027230	KR	2010-03-26	
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove Access Code ⁱ (if applicable)
10-2010-0012564	KR	2010-02-10	
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1			
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
☒ Assignee		☐ Legal Representative under 35 U.S.C. 117	
		☐ Joint Inventor	
☐ Person to whom the inventor is obligated to assign.		☐ Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	PANTECH CORPORATION		
Mailing Address Information For Applicant:			
Address 1	8 Yangjaecheonro-21gil, Suite 402, Seocho-gu		
Address 2			
City	Seoul	State/Province	
Country	KR	Postal Code	06748
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country ⁱ		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Yeesun Yoon, Reg.# 73663/		Date (YYYY-MM-DD)	2021-05-17
First Name	Yeesun	Last Name	Yoon	Registration Number
73663				

Additional Signature may be generated within this form by selecting the Add button.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	PPA0010USC1
		Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

- 1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
- 2 A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
- 3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
- 4 A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
- 5 A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
- 6 A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
- 7 A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
- 8 A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
- 9 A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM			
First Named Inventor/Applicant Name:	Kibum KWON			
Filer:	Yeasun Yoon			
Attorney Docket Number:	PPA0010USC1			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
Pages:				
Claims:				
INDEPENDENT CLAIMS IN EXCESS OF 3	1201	1	480	480
Miscellaneous-Filing:				
Petition:				

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Pantech Wireless, LLC Ex. 2023

Page 90 of 261

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2300

Electronic Acknowledgement Receipt

EFS ID:	42736641
Application Number:	17322832
International Application Number:	
Confirmation Number:	4900
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	167455
Filer:	Yeasun Yoon
Filer Authorized By:	
Attorney Docket Number:	PPA0010USC1
Receipt Date:	17-MAY-2021
Filing Date:	
Time Stamp:	22:11:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 2300
RAM confirmation Number	E20215GM12061583
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Pantech Wireless, LLC Ex. 2023

Page 92 of 261

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	PPA0010USC1-POA.pdf	149185	no	2
			8a3a5b02d6deac84280abee50fb1ba3d8f3d32c7		
Warnings:					
Information:					
2	Assignee showing of ownership per 37 CFR 3.73	PPA0010USC1-373.pdf	2325626	no	3
			632633b077a77a7cdab953c8ab8d02a93749335c		
Warnings:					
Information:					
3	Oath or Declaration filed	PPA0010USC1-Declaration.pdf	709379	no	4
			744fdfd22f2a9bb1d782a6ee949174014644477		
Warnings:					
Information:					
4	Specification	PPA0010USC1-Specification.pdf	5359443	no	51
			1493967e0a9faa6bcd14eb07de67497af1d779c		
Warnings:					
Information:					
5	Claims	PPA0010USC1-Claims_.pdf	1725400	no	8
			2bdf74cc8fed3a7f49876e8ea8bf2dba52a4cdac		
Warnings:					
Information:					
6	Abstract	PPA0010USC1-Abstract.pdf	33339	no	1
			986827f1bb5f9b29c534b6c30f12f1cb9e3aa89c		
Warnings:					
Information:					
IPB2023 01266					

7	Drawings-only black and white line drawings	PPA0010USC1-Drawings.pdf	236984	no	11				
			438e42b6317eafd6456597a6aa36441ce64e7d0e						
Warnings:									
Information:									
8	Application Data Sheet	PPA0010USC1-ADS.pdf	1860837	no	9				
			47105cc4e3c5030fc2ae31c6ebbedf0851995fab						
Warnings:									
Information:									
This is not an USPTO supplied ADS fillable form									
9	Fee Worksheet (SB06)	fee-info.pdf	36577	no	2				
			bfa0af494d1d8ad2f5a37f7aa7583f7213a6bb728						
Warnings:									
Information:									
Total Files Size (in bytes):			12436770						
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.									

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 17/322,832				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	700			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800			
TOTAL CLAIMS (37 CFR 1.16(j))	16	minus 20 = *				x 100 =	0.00			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 = *	1			x 480 =	480			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL		TOTAL	2300			
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
17/322,832	05/17/2021		2300	PPA0010USC1	16	4

CONFIRMATION NO. 4900

FILING RECEIPT



0000000125834089

167455
Capitol IP Law Group, PLLC
1918 18th St., Unit 4, NW
Washington, DC 20009

Date Mailed: 05/26/2021

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Kibum KWON, Seoul, KOREA, REPUBLIC OF;
Myungcheul JUNG, Seoul, KOREA, REPUBLIC OF;

Applicant(s)

PANTECH CORPORATION, Seoul, KOREA, REPUBLIC OF;

Power of Attorney: The patent practitioners associated with Customer Number 167455

Domestic Priority data as claimed by applicant

This application is a CON of 16/733,106 01/02/2020 PAT 11012954
which is a CON of 15/820,980 11/22/2017 ABN
which is a CON of 14/733,068 06/08/2015 PAT 9854545
which is a CON of 13/578,531 08/10/2012 PAT 9054835
which is a 371 of PCT/KR2011/000909 02/10/2011

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

REPUBLIC OF KOREA 10-2011-0008683 01/28/2011 No Access Code Provided
REPUBLIC OF KOREA 10-2010-0027230 03/26/2010 No Access Code Provided
REPUBLIC OF KOREA 10-2010-0012564 02/10/2010 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 05/24/2021

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/322,832**

Projected Publication Date: 09/02/2021

Non-Publication Request: No

Early Publication Request: No

Title

APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1

CONFIRMATION NO. 4900

PUBLICATION NOTICE



OC000000128163160

167455
Capitol IP Law Group, PLLC
1629 K Street NW Suite 300
Washington, DC 20006-1631

Title: APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

Publication No. US-2021-0274455-A1

Publication Date: 09/02/2021

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1	4900
167455	7590	09/22/2022	EXAMINER	
Capitol IP Law Group, PLLC 1629 K Street NW Suite 300 Washington, DC 20006-1631			TRUONG, LAN-HUONG	
			ART UNIT	PAPER NUMBER
			2464	
			NOTIFICATION DATE	DELIVERY MODE
			09/22/2022	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent@capitoliplaw.com

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.
2. This action is response to the application filed on 05/17/2021. Claims 1-16 are pending and herein considered.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Oath/Declaration

4. The receipt of oath/declaration is acknowledged.

Drawings

5. The drawings were received on 05/17/2021. These drawings are reviewed and accepted by the Examiner.

Specification

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

7. Claim 1 is objected to because of the following informalities:

Claim 1, line 9: There appears to be an extraneous a spacing between words "through one" should be replaced "through one".

Claim 1, line 10: There appears to be an extraneous a spacing between words "delegate CC for" should be replaced "delegate CC for".

Appropriate correction is required.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the

application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Claim(s) 1-16 is/are rejected on the ground of non-statutory double patenting as being unpatentable over claim(s) 1-20 of U.S. Patent No. 11,012,954 (Application no. 16/733,106).

Although the claims at issue are not identical, they are not patentably distinct from each other because claims of the instant application merely broaden the scope of the claims of U.S. Patent No. 11,012,954 (Application no. 16/733,106), in which the ordering of some limitations is changed, the wording is slightly modified, or slight changes in the limitations that would have been obvious to one of ordinary skill in the art have been made. It has been held that the omission an element and its function is an obvious expedient if the remaining elements perform the same function as before. *In re Karlson*, 136 USPQ 184 (CCPA). Also note *Ex parte Rainu*, 168 USPQ 375 (Bd.App.1969); omission of a reference element whose function is not needed would be obvious to one skilled in the art and where the patent and the application are directed relates generally to *receiving, at the UE, a Radio Resource Control (RRC) message through a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing group, the RRC message comprises information related to a second UL timing group, which has been set by an evolved Node B (eNB), the second UL timing group includes a secondary CC; receiving, at the UE, information indicating a random access preamble; transmitting, at the UE, the random access preamble according to a*

non-contention selection, through one or more CCs, each of the one or more CCs transmitting the random access preamble being set as a delegate CC for a respective second UL timing group; receiving, at the UE, a random access response through the primary CC, the random access response includes a Timing Advanced (TA) value that is calculated to adjust a UL transmission time for the second UL timing group in response to the transmitted the random access preamble, together with UL grant information for the UE, wherein each TA value is transmitted from the eNB for the respective second UL timing group based on the transmitted random access preamble associated with the delegate CC of the respective second UL timing group; and applying each TA value to the secondary CC for the respective second UL timing group. Thus, it would have been obvious to one of ordinary skill in the art before the effective filing date of the invention to modify claims 1-20 of U.S. Patent No. 11,012,954 (Application no. 16/733,106) to teach the invention of the claims 1-16 of the current application.

Allowable Subject Matter

9. Claims 1-16 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if a proper terminal disclaimer filed to overcome the double patenting rejection(s), set forth in this Office action.

References cited but not used

The prior arts made or record and not relied upon are considered pertinent to applicant's disclosures. Marinier et al. (U.S 2012/0008600), discloses the timing advance (TA) value used by the WTRU for uplink (UL) time alignment is provided by the network in either the RACH response to the WTRU's RACH request message and perform a method of maintaining time alignment with multiple UL carriers wherein a group of carriers operating with the same TA is referred to as a UL control carrier (CC)

set. Yoo et al. (U.S. 2009/0279495), discloses uplink time alignment between the UE and BS, a random access procedure is performed via a random access preamble. ZTE, "Impact analysis of multiple TA", 3GPP TSG RAN WG2#68bis, R2-100308, Valencia, Spain, 18-22, January 2010, discloses PRACH resources may be available on multiple UL CCs for carrier aggregation and UE try to receive RAR after its transmitted preamble and UL synchronization for the first configured/activated CC in a CC group.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAN-HUONG TRUONG whose telephone number is (571) 270-5829. The examiner can normally be reached on Monday-Friday 8am-5pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access

Art Unit: 2464

to the automated information system, call 800-786-9199 (IN USA OR CANADA) or
571-272-1000.

/LAN-HUONG TRUONG/
Primary Examiner, Art Unit 2464
09/17/2022

Notice of References Cited	Application/Control No. 17/322,832		Applicant(s)/Patent Under Reexamination KWON et al.	
	Examiner LAN-HUONG TRUONG		Art Unit 2464	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20120008600-A1	01-2012	Marinier; Paul	H04W74/0833	370/336
*	B	US-20090279495-A1	11-2009	Yoo; Hee Chul	H04W56/0045	455/552.1
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	ZTE, "Impact analysis of multiple TA", 3GPP TSG RAN WG2#68bis, R2-100308, Valencia, Spain, 18-22, January 2010 (Year: 2010)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

CPC - Searched*		
Symbol	Date	Examiner
H04W56/0045; H04W92/10; H04W88/08	09/15/2022	LT
H04L5/001; H04L5/0007	09/15/2022	LT

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
CPC searching performed	09/15/2022	LT
SEARCH PE2E performed	09/15/2022	LT
IEEE, 3GPP and IP searching performed	09/15/2022	LT
Text searching performed	09/15/2022	LT
Internet Google Patent search	09/15/2022	LT
Double Patenting searching performed	09/15/2022	LT

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<i>Search Notes</i> 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

--	--

1 - 50

Support of multiple timing advance groups for user equipment in carrier aggregation in lte

Methods, systems, and devices are described to support multiple timing advance groups for multi-carrier user equipment. Some embodiments provide for utilizing timing advance group synchronization information across multiple timing advance groups. Some embodiments provide support for performing...

QUALCOMM INC

EP2756719B1 : EPO Patents : 2020-01-15 : 5

Wireless Device Preamble Transmission Timing

A wireless device receives a control message configuring cell groups comprising a first cell group and a second cell group. The wireless device receives a control command causing the wireless device to transmit a random access preamble on a secondary cell in the secondary cell group. Transmission...

COMCAST CABLE COMM LLC

US20180100425 : US Applications : 2016-04-07 : 5

Support of multiple timing advance groups for user equipment in carrier aggregation in LTE

A method (1600) of using timing advance group synchronization information, the method comprising: identifying (1605) a plurality of component carriers as part of a carrier aggregation operation, the plurality of component carriers comprising one or more downlink component carriers and two or more...

QUALCOMM INC

ES2784513T3 : Spain Patents : 2020-09-28 : 5

Preamble Transmission in a Wireless Device

A wireless device receives a control message configuring cell groups comprising a primary cell group and a secondary cell group. The wireless device receives a control command causing the wireless device to transmit a random access preamble on random access resources of a secondary cell in the...

COMCAST CABLE COMM LLC

US20130272229 : US Applications : 2013-10-17 : 5

Wireless device preamble transmission timing

A wireless device receives a control message configuring cell groups comprising a first cell group and a second cell group. The wireless device receives a control command causing the wireless device to transmit a random access preamble on a secondary cell in the secondary cell group. Transmission...

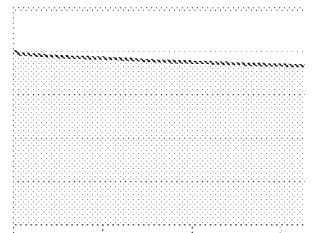
COMCAST CABLE COMM LLC

US9844096 : US Patents : 2017-12-12 : 4

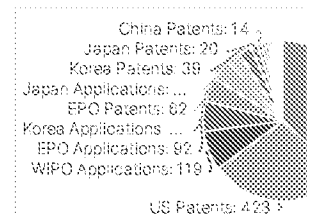
Preamble transmission in a wireless device

A wireless device receives a control message configuring cell groups comprising a primary cell group and a secondary

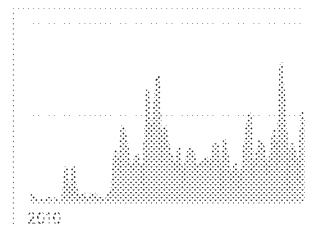
Relevance



Collections



Publication Date



Charts based on top 1500 results

More V

Result 1



About 100,531 results

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Pathloss reference configuration in a wireless device and base station



EP US • [US202002782](#) • Esmail Hejazi Dinan • Ofinno Technologies, LLC
Priority 2012-01-25 • Filed 2015-02-07 • Granted 2015-12-01 • Published 2015-12-01
a) a cell group index for said secondary cell, said cell group index identifying one of a plurality of cell groups, said plurality of cell groups comprising a primary cell group and a secondary cell group; and b) a time alignment timer parameter for each cell group in said plurality of cell groups

Au*

Wireless device preamble transmission timing



US • [US202002782](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC
Priority 2012-04-16 • Filed 2019-03-05 • Granted 2020-10-27 • Published 2020-10-27
further comprising transmitting a plurality of random access resource parameters comprising: an index, a frequency offset; and a plurality of sequence parameters. 37. The method of claim 31, wherein the configuration parameters comprise first configuration parameters of the random access resources.

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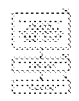
Random access mechanism for a wireless device and base station



US • [US202002782](#) • Esmail Hejazi Dinan • Ofinno Technologies, LLC
Priority 2012-04-01 • Filed 2015-01-15 • Granted 2016-07-05 • Published 2016-07-05
the wireless device is unable to acquire timing of the timing reference cell; and the secondary cell group does not comprise any other active cells except the timing reference cell. 15. The method of claim 14, further comprising allowing uplink transmission of at least one random access preamble in ...

Au*

Random access preamble transmission



WO EP US • [US202002782](#) • Esmail Hejazi Dinan • Ofinno Technologies, LLC
Priority 2012-01-25 • Filed 2013-07-20 • Granted 2013-10-22 • Published 2013-10-22
i) configurable to cause transmission of a first random access preamble on a secondary cell in said secondary cell group; and ii) unconfigurable to cause transmission of a second random access preamble on any secondary cell in said primary cell group such that any second secondary cell in said ...

Au*

Wireless device timing advance configuration



WO EP US • [US202002782](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC
Priority 2012-04-01 • Filed 2015-12-11 • Granted 2018-11-06 • Published 2018-11-06
an index identifying the random access preamble. 27. The method of claim 22, wherein the plurality of MAC dedicated parameters further comprise a deactivation parameter for at least one secondary cell. 28. The method of claim 22, further comprising determining that the cell group indicated by the ...

Au*

Wireless multicarrier random access process



WO EP US • [US202002782](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC
Priority 2012-01-25 • Filed 2018-10-23 • Granted 2021-05-18 • Published 2021-05-18
15. The method of claim 10, further comprising receiving, by the wireless device from the base station, at least one control message comprising: configuration parameters of the secondary cell and a first parameter for assignment of the secondary cell to the secondary cell group. 16. The method of

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Cell group configuration for uplink transmission in a multicarrier wireless ...



WO EP US • [EP202002782](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC
Priority 2012-04-16 • Filed 2013-04-14 • Published 2018-06-20
receiving at least one message comprising configuration parameters of a plurality of cells grouped into a plurality of cell groups; transmitting, via a first cell of the plurality of cells, a first sounding reference signal (SRS) overlapping in time with a transmission, via a second cell of the ...

Au*

Multicarrier signal transmission in wireless communications



US • [US202002782](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC
Priority 2012-01-25 • Filed 2017-08-21 • Granted 2018-09-25 • Published 2018-09-25
16. The method of claim 15, wherein the transmitting the at least one of the first RAP or the second RAP comprises transmitting the first RAP during a first time period and transmitting the second RAP during a second time period. 17. The method of claim 14, wherein the first RAP and the second RAP ...

Au*

Cell group configuration in a wireless device and base station with timing ...

WO EP • [EP202002782](#) • Esmail Dinan • Comcast Cable Communications LLC

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

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Priority 2012-01-25 • Filed 2013-01-25 • Published 2021-07-21
transmitting at least one control message comprising a timer value of a **timing** advance
timer for each of a plurality of **timing** advance **groups**; and transmitting a **timing** advance
command configured to adjust uplink transmission **timing** of a **timing** advance **group** of the
plurality of **timing** advance ...

Au*

Uplink transmission **timing** advance in a wireless device and base station

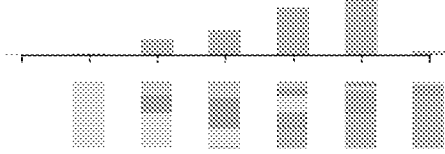


US • US20141418812 • Esmail Hejazi Ghan • Ofirno Technologies, LLC
Priority 2012-04-01 • Filed 2015-01-12 • Granted 2016-08-09 • Published 2016-08-09
wherein said first TAV is equal to a difference between reception **timing** of said secondary
timing reference and transmission **timing** of said uplink signals. 17. The wireless device of
claim 13, wherein said stored first updated TAV is released in said wireless device when
said secondary cell **group** ...

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Top 1000 results by filing date



Relative count of top 5 values

Assignees	Inventors	CPCs
Ofirno, LLC		18.5%
Comcast Cable Communications, LLC		11.4%
Lg Electronics Inc.		7.7%
シャープ株式会社		5.7%
엘지전자 주식회사		4.6%
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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	37	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 12:10 AM
L2	12	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 12:10 AM
L3	6	("20080273610" "20090186613" "20090279495").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:16 AM
L4	8	("20090274120" "2010041399" "20100111005").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:24 AM
L5	216	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:32 AM
L6	43	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (terminal OR UE OR (user adj equipment)) and (CC OR carrier)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:33 AM
L7	3922	(370/350).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:38 AM
L8	21823	(370/329).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:38 AM
L9	2840	(370/330).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:38 AM
L10	2474	(370/337).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:39 AM
L11	2290	(370/345).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:39 AM

L12	3023	(370/347).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:39 AM
L13	4	("20090005058").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:44 AM
L14	3	("20090116434").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:45 AM
L15	42	("2009/0116434").URP N.	(USPAT)	OR	ON	ON	2014/01/12 12:48 AM
L16	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH delegat\$3 NEAR3 (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:51 AM
L17	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH delegat\$3	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:52 AM
L18	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) WITH delegat\$3	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:52 AM
L19	8	delegat\$3 NEAR CC	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:53 AM
L20	2	delegat\$3 NEAR (component adj carrier)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:54 AM
L21	74	L5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:56 AM
L22	1	L5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/01/12 12:57 AM

		AND delegate	IBM_TDB)				
L23	13	set\$4 WITH (CC OR (component adj carrier)) NEAR9 aggregation NEAR4 information	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 09:39 AM
L24	2	("20120021756" "20120057490").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 09:42 AM
L27	2	("20110267957").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 09:49 AM
L28	3	("20090092091").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 09:50 AM
L30	7	("2010148532").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 10:06 AM
L31	9068	(UL OR uplink) WITH (sync OR synchronization)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 11:52 AM
L32	61	(UL OR uplink) WITH (sync OR synchronization) WITH receiv\$3 NEAR3 (random near access near preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 11:53 AM
L33	2	("2010/0331003").URP N.	(USPAT)	OR	ON	ON	2014/01/12 11:57 AM
L35	2	("20090316642").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:13 PM
L37	20	("20030096631" "20100331003" "20060166688" "20070072600" "7054298" "20040077357" "20090186613").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:23 PM
L38	7	("2006/0166688").URP N.	(USPAT)	OR	ON	ON	2014/01/12 12:46 PM
L46	2	("20090239583").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/13 01:58 PM
L47	21	("20070133611" "20120057525" "20050099986" "20030125073" "20120135715" "20090239582" "20090239583" "20120004013").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/13 02:00 PM

L50	3	("20100080155").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2014/01/13 02:19 PM
L51	11	("2010/0182992").URP N.	(USPAT)	OR	ON	ON	2014/01/13 02:25 PM
L52	2	"US 20130034087"	(US-PGPUB; USPAT; USOCR; DERWENT)	OR	ON	ON	2014/01/13 02:38 PM
L53	304	(establish\$3 OR creat\$3) WITH (UL OR uplink) NEAR3 (sync OR synchronization) and (select\$3 OR pick\$3 OR choos\$3) WITH (UE OR mobile near station OR user near equipment)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 11:41 AM
L54	3925	(370/350).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 11:46 AM
L55	20	L53 and L54	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 11:48 AM
L56	5	L53 and L54 and (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 01:43 PM
L57	15	("20080060249" "20080 305822" "20070230394 " "20080119979" "2007 0000967" "2007025465 6").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 01:46 PM
L58	2	"delegate component carrier"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 03:19 PM
L60	5	"delegate CC"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 03:20 PM
L61	21	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing and (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 03:38 PM
L62	276	set\$4 WITH (CC OR (component adj carrier))	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:34 AM

		WITH characteristic					
L63	1	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH UL NEAR3 synchronization	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:35 AM
L64	4	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH synchronization	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:35 AM
L66	31	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH state	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:36 AM
L67	256	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:38 AM
L68	1007	(370/324).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:39 AM
L69	0	L62 and L68	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:40 AM
L70	21847	(370/329).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:40 AM
L71	10	L62 and L70	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:40 AM
L72	3	("2011/0292887").URP N.	(USPAT)	OR	ON	ON	2014/01/15 09:51 AM
L73	3	("2011/0292887").URP N.	(USPAT)	OR	ON	ON	2014/01/15 09:56 AM
L74	2	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212" and establish\$3 near3 uplink	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 10:04 AM
L75	2	("2012/0063425").URP N.	(USPAT)	OR	ON	ON	2014/01/15 10:04 AM
L76	2	("13556165").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/01/15 10:16 AM

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			IBM_TDB)				
L78	13343	retransmission near data	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 10:56 AM
L80	357	retransmission near data WITH receive\$3 NEAR4 terminals	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 11:00 AM
L81	21	retransmission near data WITH receive\$3 NEAR4 terminals WITH threshold	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 11:00 AM
L83	4	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (terminal OR UE OR (user adj equipment)) and (CC OR carrier) WITH characteristic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 07:59 PM
L86	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH macro	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:58 PM
L87	11	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (threshold OR predetermin\$3 OR predefin\$3 OR preset\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 10:00 PM
L88	1308	form\$3 WITH timing near synchronization	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/16 10:13 AM
L89	13	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/16 10:14 AM
L90	4	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/01/16 11:03 AM

		(information OR message OR data) WITH (UL OR uplink) NEAR4 timing NEAR20 (simultaneously OR concurrently)	IBM_TDB)				
L91	4	("2008/0037502").URP N.	(USPAT)	OR	ON	ON	2014/01/16 11:12 AM
L94	62	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "201301662").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:19 PM
L95	62	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "201301662").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:20 PM

IPR2023-01269

		0110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "8031662").PN.					
L97	22	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "8031662").PN. and timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:20 PM
L98	4	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:21 PM

		20120188897 "20100227569 "20120307811 "8031662").PN. and timing WITH synchron\$5					
L99	44	("2007/0293224").URP N.	(USPAT)	OR	ON	ON	2014/02/15 05:23 PM
L100	17	("2012/0250520").URP N.	(USPAT)	OR	ON	ON	2014/02/15 09:09 PM
L101	17	("2012/0250520").URP N.	(USPAT)	OR	ON	ON	2014/02/15 09:13 PM
L102	13	("20100158147 "20110038271 "20110243016 "20100273515 "20090163211 "20090163211 "20090318180").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 09:41 PM
L103	435	("20080101268 "20060067364 "20050094670 "20060209870 "20040014452 "20080043619 "20050141541 "20060203760 "20060218271 "20080064390 "20080310452 "20090143074 "20090163199 "20110039536 "20050176430 "20080267126 "20020091860 "20030007490 "20080089292 "7916697 "20080287091 "20060187846 "20070206531 "7912471 "20050288022 "20060087994 "7245707 "7551643 "20050164719 "20060098688 "20060251105 "7912471 "20090092076 "20080089285 "20100272004 "20110116436 "7958542 "20070155389 "20080188223 "20080285691 "20100238903 "20040242195 "20090264164 "20030165122 "20040148427 "20070155390 "20090124259 "20100238799 "20090005051 "20070177569 "20060126554 "20050041610 "20030123485 "20070248075 "6567409 "20050085254 "20070291673 "20070258591 "20050232271 "20080076359 "2010030	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 10:47 PM

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L104	75	("20080101268" "20060 067364" "20050094670 " "20060209870" "2004 0014452" "2008004361 9" "20050141541" "200 60203760" "200602182 71" "20080064390" "20 080310452" "20090143 074" "20090163199" "2 0110039536" "2005017 6430" "20080267126" " 20020091860" "200300 07490" "20080089292" " "7916697" "200802870 91" "20060187846" "20 070206531" "7912471" " "20050288022" "20060 087994" "7245707" "75 51643" "20050164719" " "20060098688" "20060 251105" "7912471" "20 090092076" "20080089 285" "20100272004" "2 0110116436" "7958542 " "20070155389" "2008 0188223" "2008028569 1" "20100238903" "200	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 10:51 PM

		40242195" "200902641 64" "20030165122" "20 040148427" "20070155 390" "20090124259" "2 0100238799" "2009000 5051" "20070177569" " 20060126554" "200500 41610" "20030123485" " "20070248075" "65674 09" "20050085254" "20 070291673" "20070258 591" "20050232271" "2 0080076359" "2010030 9877" "6795419" "2004 0229605" "2005006334 7" "20070293224" "200 40042507" "200701553 89" "20110207427" "70 39425" "5588009" "200 30165133" "200801811 27" "20020028690" "20 010017850" "20020057 663" "20080056198" "2 0070206531" "2010016 5901" "8064676" "2009 0207771" "2010026589 6" "20010034791" "200 90239538" "200700413 82" "7525908" "200801 88223" "0776951" "760 6370" "20070291729" " 20030207696" "200702 91719" "20050009527" " "20060262811" "20100 046384" "20080280567 " "20100128669" "2007 0047452" "2010022761 4" "20100254340" "200 80268850" "201200025 89" "20050100048" "20 030119488" "20020059 464" "20020091860" "2 0050094670" "2006012 6570" "20070165635" " 20100195568" "200500 53029" "20060142019" " "20040014452" "67252 67" "20030189922" "20 050141462" "20040185 837" "20080225744" "2 0030050078" "2005026 5294" "20090086659" " 20090181710" "200903 18170" "20100027413" " "7443813" "200602511 05" "20070291646" "20 020059464" "20080240 439" "20080316959" "2					
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		uplink					
L106	44	("2007/0293224").URP N.	(USPAT)	OR	ON	ON	2014/02/15 11:15 PM
L107	15703	H04W72/04.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:47 PM
L108	230	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:47 PM
L109	6136	H04W72/00.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:48 PM
L111	1564	H04B7/216.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:48 PM
L112	7	L107 and L108	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:48 PM
L114	3	L109 and L108	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:49 PM
L115	260	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT)	OR	ON	ON	2014/05/19 01:52 PM
L116	2	("20120307821").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/27 11:56 PM
L117	1	("20120307821").PN.	(DERWENT)	OR	ON	ON	2014/06/27 11:56 PM
L118	3	("20130121264").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/28 10:01 PM
L119	31095	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:29 AM
L120	31048	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/06/29 12:30 AM

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			IBM_TDB)				
L121	885	(H04B1/7087).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:31 AM
L122	343	(establish\$3 OR creat\$3) WITH (UL OR uplink) NEAR3 (sync OR synchronization) and (select\$3 OR pick\$3 OR choos\$3) WITH (UE OR mobile near station OR user near equipment)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:31 AM
L123	53	L119 and L122	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:31 AM
L124	19	L120 and L122	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:32 AM
L125	2	L121 and L122	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:32 AM
L126	2	("20090186613").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2014/06/29 01:17 AM
L127	14	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing and (CC OR (component adj carrier)) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 09:56 AM
L128	9	("20030076812" "20090 161599" "20090290555 " "20090316642").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 10:03 AM
L129	31136	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:22 PM
L130	12	(UL OR uplink) NEAR4 timing WITH distinguished and (@pd OR @ptad OR @prad	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:28 PM

		OR @ad OR @rlad)<"20100212"					
L131	165	(UL OR uplink) NEAR4 timing WITH error and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:32 PM
L132	15	L129 and L131	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:33 PM
L133	26	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (RACH OR random NEAR access NEAR channel)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/07 10:46 PM
L134	0	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (RACH OR random NEAR access NEAR channel) WITH response	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/07 11:05 PM
L135	46	("20100260156" "8077671" "20070015511" "8274947" "20110103347" "7450944" "20100142485" "20090046665" "20100056160" "20100003981" "20120177006" "5440561" "20090070469" "20020160779" "7469142" "20030053431" "20030147370" "20100278150").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/07 11:09 PM
L136	19	("2010/0142485").URP N.	(USPAT)	OR	ON	ON	2014/12/07 11:15 PM
L137	13	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH contention	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/16 11:47 AM
L138	75	(transmit\$3 OR send\$3)	(US-PGPUB; USPAT;	OR	ON	ON	2014/12/16 11:26 AM

		WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) WITH contention	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				11:49 AM
L139	51	(component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2015/01/13 11:31 AM
L140	47	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 12:46 PM
L141	1	("2012/0108254").URP N.	(USPAT)	OR	ON	ON	2015/01/13 01:26 PM
L142	14	((MYUNCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:28 PM
L162	41	("20090116434" "20090 274120" "8606336" "20 110170495" "20090318 175" "20100086065" "2 0100238857" "2010032 3744" "20100041399" " 20090270094" "200903 16642" "20100111005" " 20100118720").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2015/01/13 01:51 PM
L177	2316	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 11:59 AM
L178	421	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:04 PM
L179	421	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:05 PM
L180	230	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:05 PM
L181	185	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:06 PM

		advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink)					
L182	169	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:07 PM
L183	3	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency)) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:08 PM
L184	9	("20030076812" "20090 161599" "20090290555 " "20090316642").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:17 PM
L185	2	tim\$4 NEAR3 group SAME (calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 03:08 PM
L186	50	("2012/0307811").URP N.	(USPAT)	OR	ON	ON	2016/12/12 03:18 PM
L187	17	("20070189205" "20100 227569" "20110261776 " "20110268032" "2011 0299489" "2012011394	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/14 04:27 PM

		1 "20120300743 "20120307811").PN.					
L188	3	("8982805").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/14 04:47 PM
L189	34	("20110039593 "20110159903 "20110045837 "20110243048 "20090279495 "20100232382 "20110026475 "20110243106 "20080310395 "20100177747 "20110235609 "20110317777 "20100296467 "20110134774 "20070293224").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/14 05:02 PM
L190	182	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR2 preamble) AND synchroniz\$4 NEAR2 (UL OR uplink) AND (carrier OR CC OR (common component ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/16 11:58 AM
L191	180	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR2 preamble) AND synchroniz\$4 NEAR2 (UL OR uplink) SAME (carrier OR CC OR (common component ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/16 11:58 AM
L192	0	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR2 preamble) AND synchroniz\$4 NEAR2 (UL OR uplink) SAME (carrier OR CC OR (common component ADJ carrier) OR (carrier ADJ frequency)) and (@pd OR @ptad OR @prad	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/16 11:58 AM

		OR @ad OR @rlad)<"20100210"					
L193	243	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:36 AM
L194	178	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:36 AM
L195	185	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:37 AM
L196	204	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR4 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:37 AM
L197	196	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2016/12/19 11:38 AM

		OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR2 (UL OR uplink)	IBM_TDB)				
L198	1	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) NEAR5 value SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR2 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:38 AM
L199	17	("20080002660" "20140293853" "20140073337" "20160100374" "20080279131" "20130116002").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:39 AM
L200	6	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random ADJ access ADJ response) NEAR5 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 12:11 PM
L201	10	("20100238908" "20110243111" "20120063425" "20120099577").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 12:13 PM
L202	120	random ADJ access NEAR2 (response OR reply) SAME timing NEAR2 advanc\$3 AND @ad<"20100210" AND (calculat\$4 OR comput\$3 OR determin\$3 OR estimat\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 01:18 PM
L203	42	random ADJ access NEAR2 (response OR reply) SAME timing NEAR2 advanc\$3 AND @ad<"20100210" AND (calculat\$4 OR comput\$3 OR determin\$3 OR	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 01:19 PM

		estimat\$3) WITH timing NEAR2 advanc\$3					
L204	2533	(H04J3/00).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 03:12 PM
L205	2	("20150271770").PN.	(US-PGPUB; USPAT; USOCR; DERWENT)	OR	ON	ON	2016/12/20 09:10 AM
L206	56	delegat\$3 NEAR2 (carrier OR CC OR CCs)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 11:59 AM
L207	26	delegat\$3 NEAR2 (carrier OR CC OR CCs) AND synchronization	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 12:00 PM
L208	6	("20080273610" "20090 186613" "20090279495 ").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 12:09 PM
L209	3	("20100118720").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/24 12:20 PM
L210	148	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic AND ((UL NEAR PCC) OR Pcell OR primary) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 02:16 PM
L211	309	set\$4 WITH (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:02 AM
L212	8428	(CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:03 AM
L213	561	(TA OR timing ADJ advanced) SAME (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:04 AM

		@rlad)<"20100212"					
L214	10	(calculat\$3 OR comput\$4 OR estimat\$4) SAME (TA OR timing ADJ advanced) SAME (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:05 AM
L215	2	("20100222059").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/26 02:02 AM
L216	34	("2010/0222059").URP N.	(USPAT)	OR	ON	ON	2016/12/26 02:06 AM
L217	9	set\$4 WITH (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) AND tim\$3 ADJ2 group and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/26 01:11 PM
L218	2	("20100142485").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/26 03:28 PM
L219	0	WO2009079913	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/26 11:16 PM
L220	5	"2009079913"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/26 11:16 PM
L221	64	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 09:54 AM
L222	21	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 09:54 AM
L232	61	("20090116434" "20090 274120" "20100177747 "20090270094" "2010 0041399" "2010011872 0" "20080002660" "200 80188219" "201001424 85" "20090316642" "20 090318175" "20100238 857" "8606336" "20100 111005" "20100323744 "20100238872" "2012 0008600" "2009027949	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2017/08/18 04:08 PM

		5 "20100086065 "20110170495 "20080268850").PN.					
L233	574	(TA OR timing ADJ advanced) SAME (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 06:26 PM
L234	2976	(H04J3/00).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 10:30 PM
L235	5	("9854545").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2018/11/09 11:14 PM
L236	539	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 11:47 PM
L237	4191	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 11:48 PM
L238	1	L234 AND L237	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 11:50 PM
L239	3	("9054835").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2018/11/09 11:52 PM
L240	3	("9054835").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/06/05 07:05 AM
L241	41	("20090116434 "20090274120 "8606336 "20110170495 "20090318175 "20100086065 "20100238857 "20100323744 "20100041399 "20090270094 "20090316642 "20100111005 "20100118720").PN.	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/06/05 08:36 AM
L242	3121	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/05 08:38 AM

L243	697	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) NEAR2 primary SAME (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/05 08:45 AM
L244	55	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) NEAR2 primary SAME (RRC OR (radio ADJ resource ADJ control)) SAME timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/05 08:46 AM
L245	0	random ADJ access NEAR2 (response OR reply) SAME timing NEAR2 groups AND @ad<"20100210" AND (calculat\$4 OR comput\$3 OR determin\$3 OR estimat\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:22 AM
L246	0	(RAP OR (random ADJ access ADJ preamble)) NEAR5 (response OR reply) SAME ((CC carrier) NEAR2 (second secondary other another)) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:30 AM
L247	5	(RAP OR (random ADJ access ADJ preamble)) SAME ((CC carrier) NEAR2 (second secondary other another)) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:32 AM
L248	7568	timing NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:39 AM
L249	17	timing NEAR2 advanced SAME tim\$3 NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:40 AM
L250	586	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/27 11:44 PM
L251	6	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 12:20 PM

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		(information OR message OR data) SAME (UL OR uplink) NEAR3 (tim\$3 timing) WITH delegat\$3 NEAR3 (CC OR (component adj carrier))					
L252	10	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5 (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) WITH delegat\$3 NEAR3 (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 12:35 PM
L253	196	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5 (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) WITH (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 02:55 PM
L254	30	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5 (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) WITH (CC OR (component adj carrier)) NEAR2 (primary CC1 CC2 secondary other another)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 03:26 PM
L255	77	("2013/0250925").URP N.	(USPAT)	OR	ON	ON	2019/07/09 03:29 PM
L256	308	(forward\$3 OR transmit\$3 OR send\$3) WITH (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) SAME (CC OR (component adj carrier)) NEAR2 (primary CC1 CC2 secondary other another)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 04:58 PM
L257	4	("20120008600").PN.	(US-PGPUB; USPAT;	OR	ON	ON	2019/07/09

			USOCR; FPRS; JPO; DERWENT)				05:34 PM
L258	16731	carrier ADJ2 aggregation AND timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:39 PM
L259	505	RACH SAME carrier ADJ2 aggregation AND timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:40 PM
L261	141	RACH SAME carrier ADJ2 aggregation AND timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:41 PM
L262	141	RACH SAME (CC1 CCs CC2 carriers) ADJ2 aggregation AND timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:41 PM
L263	636	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation AND timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:42 PM
L264	292	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation SAME timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:43 PM
L265	291	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation SAME timing NEAR2 groups AND timing NEAR2 advance	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:43 PM
L266	257	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:44 PM
L267	309	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:44 PM
L268	205	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:45 PM

		(carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)					
L269	5	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance) AND second ADJ timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:46 PM
L270	13	("20110243111" "20110243102" "20120099577" "20120250520" "20120300715" "20120294272" "20110243102").PN.	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:50 PM
L271	2	("20120300715").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/09 06:12 PM
L272	74	("2012/0300715").URP N.	(USPAT)	OR	ON	ON	2019/07/09 06:12 PM
L273	3	delegat\$3 SAME (component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 01:56 PM
L274	6	("20080273610" "20090186613" "20090279495").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 02:33 PM
L275	165	(TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 11:46 PM
L277	13	(TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND (UL uplink) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 11:48 PM
L278	6	(TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND (UL uplink) AND (RACH OR (random ADJ access)) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 11:49 PM
L279	2	("20080267165").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/24 08:45 AM
L280	4	("20120008600").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO;	OR	ON	ON	2019/07/24 11:49 PM

			DERWENT)				
L281	3	("9054835").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/24 11:52 PM
L282	5	("9854545").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/24 11:59 PM
L283	60	timing AND (component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:40 PM
L284	67	timing AND (component NEAR carrier AND (primary NEAR2 CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:40 PM
L285	2491	timing AND (component NEAR carrier AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:49 PM
L286	89	updat\$3 NEAR2 timing AND (component NEAR carrier AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:49 PM
L287	10	updat\$3 NEAR2 timing NEAR2 group AND (component NEAR carrier AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:49 PM
L288	12348	updat\$3 NEAR2 timing NEAR2 group aggregat\$3 NEAR2 carrier AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:51 PM
L291	109	updat\$3 NEAR2 timing NEAR2 group	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 03:04 PM
L292	12	updat\$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 03:05 PM
L293	2	("20200145949").PN.	(US-PGPUB; USPAT; USOCR; DERWENT)	OR	ON	ON	2020/08/26 09:41 PM
L294	152373	(H04W56/0005 or H04W76/27 or H04W74/004 or H04W56/0045 or H04W88/08 or H04W92/10 or H04W56/0015 or H04W74/08).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/26 10:12 PM
L295	108349	(H04L5/001 or H04L5/0007).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2020/08/26 10:12 PM

			JPO; DERWENT; IBM_TDB)				
L296	1453	(H04B1/7087).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/26 10:12 PM
L297	80	((("KWON") near3 ("Kibum"))).INV.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/08/26 10:13 PM
L298	28	((("JUNG") near3 ("Myungcheul"))).INV.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/08/26 10:13 PM
L299	3343	timing AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:05 PM
L300	3491	(TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:05 PM
L301	157	(TA timing) SAME ((CC2 CC2 CCs (component NEAR carrier)) SAME (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:05 PM
L302	55	("20080232316" "20110 013581" "20050053029 "8125948" "20110075 629" "20110098074" "2 0100240372" "2011000 3555" "20110261714" " 7782899" "2005005302 9" "20080212556" "201 10122794" "201201478 30" "20110268032" "20 060034204" "20080232 316" "20100130218" "2 0110142009" "2011023 5609" "20100302964" " 20100227569" "201002 85809" "20120218987") .PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:26 PM
L303	3	("20120099577").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2020/08/27 12:35 PM
L304	11	("2012/0099577").URP N.	(USPAT)	OR	ON	ON	2020/08/27 12:41 PM
L305	10	("20100238908" "20110 243111" "20120063425 "20120099577").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 02:02 PM
L306	80	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 12:29 AM
L307	28	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 12:29 AM

L308	12975	H04W72/00.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 12:34 AM
L309	3310	(H04J3/00).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 12:35 AM
L310	159786	(H04W56/0005 or H04W76/27 or H04W74/004 or H04W56/0045 or H04W88/08 or H04W92/10 or H04W56/0015 or H04W74/08).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 12:35 AM
L311	40	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:03 AM
L312	13	updat\$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:04 AM
L313	9	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 01:09 AM
L314	115654	RRC ANDdelegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 01:09 AM
L315	9	((radio ADJ resource ADJ control) OR RRC) AND delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 01:09 AM
L316	7	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink) AND ((radio ADJ resource ADJ control) OR RRC) AND RAP	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:11 AM
L317	17	(RAP OR random ADJ	(US-PGPUB; USPAT;	OR	ON	ON	2020/12/18

		access ADJ preamble) AND (creat\$3 form\$3) WITH timing near4 synchronization NEAR7 (UL OR uplink)	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:12 AM
L318	3	(apply obtain\$3) NEAR5 (TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND (UL uplink) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:14 AM
L319	60393	(H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:20 AM
L320	2181	H04B7/216.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:20 AM
L321	279	RAP AND (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:22 AM
L337	9	((timing ADJ2 advanced) OR TA) AND delegat\$3 NEAR2 CC AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 10:55 AM
L338	9	delegat\$3 NEAR2 CC AND (TA timing) AND (((second secondary) ADJ2 CC) CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 11:02 AM
L339	390	(SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing AND (transmit\$3 OR send\$3) WITH (CC OR (component ADJ carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 10:48 AM
L340	11	(((second secondary) ADJ2 CC) CC2 CC2 CCs (component NEAR carrier)) AND delegat\$3 NEAR2 CC AND (TA	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2022/09/16 10:54 AM

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		timing) AND (primary NEAR2 CC)) AND UL NEAR2 timing					
L341	10797	(CC1 CC-1 (primary NEAR2 CC)) AND (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 10:59 AM
L342	4825	(CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L343	1363	(CC1 CC-1 (primary NEAR2 CC)) Near7 (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L344	1111	(CC1 CC-1 (primary NEAR2 CC)) Near5 (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L345	803	(CC1 CC-1 (primary NEAR2 CC)) Near5 (TA OR tim\$7 OR timing) NEAR5(CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L346	76	L319 AND L345	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:01 AM
L347	40	tim\$3 NEAR2 groups AND (TA OR tim\$4 NEAR2 advanced) SAME (UL uplink) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:34 AM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N143	3665	(370/350).CCLS.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:08 AM
N144	51	(component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:31 AM
N145	7	uplink NEAR timing NEAR group.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:31 AM

N146	22	UL NEAR group.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:31 AM
N147	83	synchronization NEAR request NEAR message.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:32 AM
N148	9	N143 AND N147	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:34 AM
N149	2	N146 AND N147	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:36 AM
N150	1	N144 AND N147	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:36 AM
N151	5348	uplink AND synchronization.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:37 AM
N152	646	N143 AND N151	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:40 AM
N153	1	N146 AND N152	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:40 AM
N154	1	N147 AND N152	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:40 AM
N155	3	UL NEAR timing NEAR group.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:42 AM
N156	15	(component NEAR carrier AND (primary NEAR CC) AND (second NEAR CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:44 AM
N157	3	delegate ADJ CC.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:32 PM
N158	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:32 PM
N159	1	N147 AND N158	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:33 PM
N160	10	N144 AND N158	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:33 PM
N161	64	(primary ADJ CC) AND (radio NEAR resource NEAR control) AND timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:34 PM
N163	8801	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:00 PM
N164	213	(H04B1/7087).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:00 PM
N165	8686	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:00 PM
N166	3665	(370/350).CCLS.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM
N167	86	(primary ADJ CC) AND (radio NEAR resource	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM

		NEAR control).clm.					
N168	7	N163 AND N167	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM
N169	86	N167 AND N167	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM
N170	56	N165 AND N167	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:02 PM
N171	5348	uplink AND synchronization.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:04 PM
N172	431	N163 AND N171	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:04 PM
N173	3	N167 AND N172	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:04 PM
N174	8686	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:31 PM
N175	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:32 PM
N176	56	N174 AND N175	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:32 PM
N223	15660	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 10:49 AM
N224	275	uplink AND timing NEAR advance NEAR value.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 10:50 AM
N225	12	uplink AND timing NEAR advance NEAR value AND RAR.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 10:50 AM
N226	5	uplink NEAR timing AND TA NEAR value AND RAR.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:02 AM
N227	93	(component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:20 AM
N228	236	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:20 AM
N229	0	N223 AND N224 AND N228	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:20 AM
N230	21	N223 AND N224	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:21 AM
N231	3	N224 AND N228	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:21 AM
N322	6	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:04 AM
N323	85	(TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:04 AM

		(primary NEAR2 CC)).clm.					
N324	6	updat\$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:04 AM
N325	6	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:08 AM
N326	9	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:08 AM
N327	8	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:09 AM
N328	8	((radio ADJ resource ADJ control) OR RRC) AND delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:10 AM
N329	5	(RAP OR random ADJ access ADJ preamble) AND (creat\$3 form\$3) WITH timing near4 synchronization NEAR7 (UL OR uplink).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:12 AM
N330	523	H04B7/216.CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:20 AM
N331	761	(H04J3/00).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:20 AM
N332	42755	(H04W56/0005 or H04W76/27 or H04W74/004 or H04W56/0045 or H04W88/08 or H04W92/10 or H04W56/0015 or H04W74/08).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:21 AM
N333	40	(receiv\$3 get\$4) SAME	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18

		(CC OR (component adj carrier)) NEAR2 primary SAME (RRC OR (radio ADJ resource ADJ control)).clm.					01:21 AM
N336	11	RAP AND (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:22 AM
N339	8	((timing ADJ2 advanced) OR TA) AND delegat\$3 NEAR2 CC AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 10:57 AM



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BIB DATA SHEET

CONFIRMATION NO. 4900

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.	
17/322,832	05/17/2021	370	2464	PPA0010USC1	
RULE					
APPLICANTS PANTECH CORPORATION, Seoul, KOREA, REPUBLIC OF; INVENTORS Kibum KWON, Seoul, KOREA, REPUBLIC OF; Myungcheul JUNG, Seoul, KOREA, REPUBLIC OF; ** CONTINUING DATA ***** This application is a CON of 16/733,106 01/02/2020 PAT 11012954 which is a CON of 15/820,980 11/22/2017 ABN which is a CON of 14/733,068 06/08/2015 PAT 9854545 which is a CON of 13/578,531 08/10/2012 PAT 9054835 which is a 371 of PCT/KR2011/000909 02/10/2011 ** FOREIGN APPLICATIONS ***** REPUBLIC OF KOREA 10-2011-0008683 01/28/2011 REPUBLIC OF KOREA 10-2010-0027230 03/26/2010 REPUBLIC OF KOREA 10-2010-0012564 02/10/2010 ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 05/24/2021					
Foreign Priority claimed ☒ Yes ☐ No 35 USC 119(a-d) conditions met ☒ Yes ☐ No Verified and /LAN HUONG Acknowledged TRUONG/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY KOREA, REPUBLIC OF	SHEETS DRAWINGS 11	TOTAL CLAIMS 16	INDEPENDENT CLAIMS 4
ADDRESS Capitol IP Law Group, PLLC 1629 K Street NW Suite 300 Washington, DC 20006-1631 UNITED STATES					
TITLE APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM					
FILING FEE RECEIVED 2300	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/322,832	Filing Date 05/17/2021	☐ To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		x \$480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

	(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	12/21/2022		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	x \$100 = 0
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 4	= 0	x \$480 = 0
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						0
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/PEARLIE A FENNELL/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".						
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.						

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce
Electronic Petition Request	TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	
Application Number	17322832	
Filing Date	17-May-2021	
First Named Inventor	Kibum KWON	
Attorney Docket Number	PPA0010USC1	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM	
☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action ☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.		
Owner	Percent Interest	
PANTECH CORPORATION	100%	
The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s) 11012954 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns. In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later: - expires for failure to pay a maintenance fee; - is held unenforceable; - is found invalid by a court of competent jurisdiction; - is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; - has all claims canceled by a reexamination certificate; - is reissued; or - is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer. ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.		

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status: ☐ Small Entity ☐ Micro Entity ☒ Regular Undiscounted	
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number <u>73663</u> ☐ A sole inventor ☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ☐ A joint inventor; all of whom are signing this request	
Signature	/Yeesun Yoon, Reg.# 73663/
Name	Yeesun Yoon

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
 Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	17322832			
Filing Date:	17-May-2021			
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM			
First Named Inventor/Applicant Name:	Kibum KWON			
Filer:	Yeasun Yoon			
Attorney Docket Number:	PPA0010USC1			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

IPR2023-01269

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Page 159 of 261

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				170

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 17322832

Filing Date: 17-May-2021

Applicant/Patent under Reexamination: KWON

Electronic Terminal Disclaimer filed on December 21, 2022

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	47229712
Application Number:	17322832
International Application Number:	
Confirmation Number:	4900
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	167455
Filer:	Yeasun Yoon
Filer Authorized By:	
Attorney Docket Number:	PPA0010USC1
Receipt Date:	21-DEC-2022
Filing Date:	17-MAY-2021
Time Stamp:	16:57:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 170
RAM confirmation Number	E2022BKG57293808
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	41471	no	2
			4b442c3f6c665c874b902acb9ecd9cf95f61a913		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	37809	no	2
			5dbd773cf49714102a71936b11e6fecfb3a1ca3a		
Warnings:					
Information:					
Total Files Size (in bytes):			79280		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Kibum KWON, *et al.*

Application No.: 17/322,832

Filing Date: May 17, 2021

Examiner: TRUONG, LAN-HUONG

Group Art Unit: 2464

Confirmation No.: 4900

Attorney Docket No.: PPA0010USC1

Title APPARATUS AND METHOD FOR ESTABLISHING UPLINK
: SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

REPLY AND AMENDMENT UNDER 37 C.F.R. § 1.111

Sir or Madam:

In response to the Non-Final Office Action dated September 22, 2022 (“Office Action”), Applicant respectfully requests reconsideration of the application in view of the following Amendments and Remarks.

Amendments to the Claims begin on page 2.

Remarks begin on page 11.

No extensions of time are required at this time. If extensions of time are necessary to prevent abandonment of this application, then they are petitioned for under 37. C.F.R. §1.136(a).

No fees for net addition of claims are required at this time. Any fees required for extensions of time or for the net addition of claims may be charged to our Deposit Account No. 603320.

AMENDMENTS TO THE CLAIMS / CLAIM LIST

Please **AMEND** claim 1 shown below.

This claim list replaces all prior claim lists in the application.

1.(Currently Amended) A communication method for a user equipment (UE) comprising:

receiving, at the UE, a Radio Resource Control (RRC) message through a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing group, the RRC message comprises information related to a second UL timing group, which has been set by an evolved Node B (eNB), the second UL timing group includes a secondary CC;

receiving, at the UE, information indicating a random access preamble;

transmitting, at the UE, the random access preamble according to a non-contention selection, through [[]]one or more CCs, each of the one or more CCs transmitting the random access preamble being set as a delegate [[]]CC for a respective second UL timing group;

receiving, at the UE, a random access response through the primary CC, the random access response includes a Timing Advanced (TA) value that is calculated to adjust a UL transmission time for the second UL timing group in response to the transmitted the random access preamble, together with UL grant information for the UE, wherein each TA value is transmitted from the eNB for the respective second UL timing

group based on the transmitted random access preamble associated with the delegate CC of the respective second UL timing group; and

applying each TA value to the secondary CC for the respective second UL timing group.

2.(Original) The method of claim 1, wherein the one or more delegate CCs correspond to at least one of i) a CC having a lowest center frequency value, ii) a CC having a center frequency value that is closest to a mean value, iii) a CC having a highest center frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be used for monitoring downlink (DL) quality, from among a plurality of CCs forming the second UL timing group; and the CC is included in one or more serving cells.

3.(Original) The method of claim 1, wherein the second UL timing group is configured of i) at least one CC having a difference in a center frequency value within a threshold range, ii) at least one CC to which a same beamforming scheme is applied, iii) at least one CC used in devices in a same radio network, or iv) at least one CC that does not belong to another second UL timing group, from among a plurality of CCs; and the second UL timing group is generated by the UE or the eNB.

4. (Original) The method of claim 1, wherein the random access response is configured to include the TA value distinguished based on the second UL timing group, to include a unit error distinguished based on the second UL timing group, or to include

an error distinguished based on the second UL timing group and having a size of an integer-multiple of a predetermined unit value, or is configured as an indicator associated with a rule determined based on the second UL timing group, and the random access response is distinguished based on a group index of the second UL timing group.

5. (Original) A communication apparatus for a user equipment (UE) comprising:
a memory; and
a processor operably coupled to the memory;
wherein the processor, when executing program instructions stored in the memory, is configured to:

cause the apparatus to receive a Radio Resource Control (RRC) message through a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing group, the RRC message comprises information related to a second UL timing group, which has been set by an evolved Node B(eNB), the second UL timing group includes a secondary CC;

cause the apparatus to receive information indicating a random access preamble;
cause the apparatus to transmit the random access preamble according to a non-contention selection, through one or more UL CCs, each of the one or more UL CCs transmitting the random access preamble being set as a delegate CC for a respective second UL timing group;

cause the apparatus to receive a random access response through the primary CC, the random access response includes a Timing Advanced(TA) value that is calculated to adjust a UL transmission time for the second UL timing group in response to the

transmitted the random access preamble, together with UL grant information for the UE, wherein each TA value is transmitted from the eNB for the respective second UL timing group based on the transmitted random access preamble associated with the delegate CC of the respective second UL timing group; and

cause the apparatus to apply each TA value to the secondary CC for the respective second UL timing group.

6. (Original) The UE of claim 5, wherein the one or more delegate CCs correspond to at least one of i) a CC having a lowest center frequency value, ii) a CC having a center frequency value that is closest to a mean value, iii) a CC having a highest center frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be used for monitoring downlink (DL) quality, from among a plurality of CCs forming the second UL timing group; and the CC is included in one or more serving cells.

7. (Original) The UE of claim 5, wherein the second UL timing group is configured of i) at least one CC having a difference in a center frequency value within a threshold range, ii) at least one CC to which a same beamforming scheme is applied, iii) at least one CC used in devices in a same radio network, or iv) at least one CC that does not belong to another second UL timing group, from among a plurality of CCs; and the second UL timing group is generated by the UE or the eNB.

8. (Original) The UE of claim 5, wherein the random access response is configured to include the TA value distinguished based on the second UL timing group, to include a unit error distinguished based on the second UL timing group, or to include an error distinguished based on the second UL timing group and having a size of an integer-multiple of a predetermined unit value, or is configured as an indicator associated with a rule determined based on the second UL timing group, and the random access response is distinguished based on a group index of the second UL timing group.

9. (Original) A communication method for an evolved Node-B (eNB) comprising:

transmitting, to a user equipment (UE), a Radio Resource Control (RRC) message through a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing group, the RRC message comprises information related to a second UL timing group, the second UL timing group includes a secondary CC;

transmitting, to the UE, information indicating a random access preamble;

receiving, from the UE, the random access preamble according to a non-contention selection, through one or more UL CCs, each of the one or more UL CCs transmitting the random access preamble being set as a delegate CC for a respective second UL timing group; and

transmitting, to the UE, a random access response through the primary CC, the random access response includes a Timing Advanced (TA) value to adjust a UL transmission time for the second UL timing group in response to the transmitted the random access preamble, together with UL grant information for the UE,

wherein each TA value is calculated by the eNB for the respective second UL timing group based on the received random access preamble associated with the delegate CC of the respective second UL timing group, and

wherein the TA value is configured to be applied to the secondary CC for respective second UL timing group.

10. (Original) The method of claim 9, wherein the one or more delegate CCs correspond to at least one of i) a CC having a lowest center frequency value, ii) a CC having a center frequency value that is closest to a mean value, iii) a CC having a highest center frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be used for monitoring downlink (DL) quality, from among a plurality of CCs forming the second UL timing group; and the CC is included in one or more serving cells.

11. (Original) The method of claim 9, wherein the second UL timing group is configured of i) at least one CC having a difference in a center frequency value within a threshold range, ii) at least one CC to which a same beamforming scheme is applied, iii) at least one CC used in devices in a same radio network, or iv) at least one CC that does not belong to another second UL timing group, from among a plurality of CCs; and the second UL timing group is generated by the UE or the eNB.

12. (Original) The method of claim 9, wherein the random access response is configured to include the TA value distinguished based on the second UL timing group,

to include a unit error distinguished based on the second UL timing group, or to include an error distinguished based on the second UL timing group and having a size of an integer-multiple of a predetermined unit value, or is configured as an indicator associated with a rule determined based on the second UL timing group; and the random access response is distinguished based on a group index of the second UL timing group.

13. (Original) A communication apparatus for an evolved Node-B (eNB) comprising:

a memory; and

a processor operably coupled to the memory;

wherein the processor, when executing program instructions stored in the memory, is configured to:

cause the apparatus to transmit, to a user equipment (UE), a Radio Resource Control (RRC) message through a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing group, the RRC message comprises information related to a second UL timing group, the second UL timing group includes a secondary CC;

cause the apparatus to transmit, to the UE, information indicating a random access preamble;

cause the apparatus to receive, from the UE, the random access preamble according to a non-contention selection, through one or more UL CCs, each of the one or more UL CCs transmitting the random access preamble being set as a delegate CC for a respective second UL timing group; and

cause the apparatus to transmit, to the UE, a random access response through the primary CC, the random access response includes a Timing Advanced (TA) value to adjust a UL transmission time for the second UL timing group in response to the received the random access preamble, together with UL grant information for the UE,

wherein each TA value is calculated by the eNB for the respective second UL timing group based on the received random access preamble associated with the delegate CC of the respective second UL timing group, and

wherein the TA value is configured to be applied to the secondary CC for respective second UL timing group.

14. (Original) The eNB of claim 13, wherein the one or more delegate CCs correspond to at least one of i) a CC having a lowest center frequency value, ii) a CC having a center frequency value that is closest to a mean value, iii) a CC having a highest center frequency value, iv) a CC having a broadest frequency band, and v) a CC that is set to be used for monitoring downlink (DL) quality, from among the plurality of CCs forming the second UL timing group; and the CC is included in one or more serving cells.

15. (Original) The eNB of claim 13, wherein the second UL timing group is configured of i) at least one CC having a difference in a center frequency value within a threshold range, ii) at least one CC to which a same beamforming scheme is applied, iii) at least one CC used in devices in a same radio network, or iv) at least one CC that does

not belong to another UL timing group, from among the plurality of CCs; and the second UL timing group is generated by the UE or the eNB.

16. (Original) The eNB of claim 13, wherein the random access response is configured to include the TA value distinguished based on the second UL timing group, to include a unit error distinguished based on the second UL timing group, or to include an error distinguished based on the second UL timing group and having a size of an integer-multiple of a predetermined unit value, or is configured as an indicator associated with a rule determined based on the second UL timing group; and the random access response is distinguished based on a group index of the second UL timing group.

REMARKS

Claim 1 has been amended. Accordingly, claims 1-16 are currently pending in the Application, of which claims 1, 5, 9 and 13 are independent.

Applicants respectfully submit that the above amendments do not add new matter to the Application and are fully supported by the specification.

In view of the above amendments and the following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending objections and rejections for the reasons discussed below.

Claim Objections

Claim 1, line 9 and 10 are objected to because of the informalities.

Claim 1, line 9 and 10 have been amended to correct the informalities as following,

Claim 1, line 9: An extraneous spacing between words “through one” is replaced “through one”.

Claim 1, line 10: An extraneous spacing between words “delegate CC for” is replaced “delegate CC for”.

Accordingly, Applicants respectfully requests withdrawal of the objections for claim 1.

Rejection of Claims under Double Patenting

Claims 1-16 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U. S. Patent No. 11,012,954 (Application no. 16/733,106).

Applicant notes that “[t]he filing of a terminal disclaimer to obviate a rejection based on nonstatutory double patenting is not an admission of the propriety of the rejection [because] the filing of a terminal disclaimer simply serves the statutory function of removing the rejection of double patenting, and raises neither a presumption nor estoppel on the merits of the rejection” (MPEP § 804.02.II, citations omitted). Hence, the terminal disclaimer included with this reply simply serves the statutory function of removing the double patenting rejection without raising a presumption or estoppel on the merits of the rejection.

CONCLUSION

A full and complete response has been made to the pending Office Action, and all of the stated objections and grounds for rejection have been overcome or rendered moot. Accordingly, all pending claims are allowable, and the application is in condition for allowance.

The Examiner is invited to contact Applicant's undersigned representative at the number below if it would expedite prosecution. Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

/Yeesun Yoon, Reg.# 73663/

Yeesun Yoon
Reg. No. 73,663

Date: December 21, 2022

CUSTOMER NO. 167455
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1629 K Street NW Suite 300
Washington DC 20006-1631
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YY/esp

Electronic Acknowledgement Receipt

EFS ID:	47255805
Application Number:	17322832
International Application Number:	
Confirmation Number:	4900
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	167455
Filer:	Yeasun Yoon
Filer Authorized By:	
Attorney Docket Number:	PPA0010USC1
Receipt Date:	21-DEC-2022
Filing Date:	17-MAY-2021
Time Stamp:	16:59:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		PPA0010USC1-NFOAReply.pdf	134696	yes	13
			c4b67b25e06258f41cdcf30829234b5339 66c0c		

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

Page 177 of 261

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Request for Reconsideration-After Non-Final Rejection	1	1
	Claims	2	10
	Applicant Arguments/Remarks Made in an Amendment	11	13
Warnings:			
Information:			
Total Files Size (in bytes):		134696	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			



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NOTICE OF ALLOWANCE AND FEE(S) DUE

167455 7590 01/17/2023
Capitol IP Law Group, PLLC
1629 K Street NW Suite 300
Washington, DC 20006-1631

EXAMINER	
TRUONG, LAN-HUONG	
ART UNIT	PAPER NUMBER
2464	

DATE MAILED: 01/17/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1	4900

TITLE OF INVENTION: APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	04/17/2023

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

167455 7590 01/17/2023
Capitol IP Law Group, PLLC
1629 K Street NW Suite 300
Washington, DC 20006-1631

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/322.832	05/17/2021	Kibum KWON	PPA0010USC1	4900

TITLE OF INVENTION: APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	04/17/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
TRUONG, LAN-HUONG	2464	370-350000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1	4900
167455	7590	01/17/2023	EXAMINER	
Capitol IP Law Group, PLLC 1629 K Street NW Suite 300 Washington, DC 20006-1631			TRUONG, LAN-HUONG	
			ART UNIT	PAPER NUMBER
			2464	
DATE MAILED: 01/17/2023				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 17/322,832	Applicant(s) KWON et al.	
	Examiner LAN-HUONG TRUONG	Art Unit 2464	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/21/2022.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-16. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☒ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☒ Certified copies of the priority documents have been received in Application No. 15/820,980.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)	5. ☐ Examiner's Amendment/Comment
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.	6. ☒ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☐ Other _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	

/LAN-HUONG TRUONG/
Primary Examiner, Art Unit 2464

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.
2. This action is in response to the amendment filed on 12/21/2022.

Response to arguments

3. An Electronic Terminal Disclaimer filed on 12/21/2022 has been recorded and approved 12/21/2022. Therefore, the double patenting rejection is withdrawn. Arguments are persuasive and the previous rejection is withdrawn.

Allowable Subject Matter

Claims 1-16 are allowed.

The following is an examiner's statement of reasons for allowance:

The closest prior arts are Marinier et al. (U.S. 2012/0008600); Yoo et al. (U.S. 2009/0279495) and ZTE, "Impact analysis of multiple TA", 3GPP TSG RAN WG2#68bis, R2-100308, Valencia, Spain, 18-22, January 2010.

Marinier et al. (U.S. 2012/0008600), discloses the timing advance (TA) value used by the WTRU for uplink (UL) time alignment is provided by the network in either the RACH response to the WTRU's RACH request message and perform a method of maintaining time alignment with multiple UL carriers wherein a group of carriers operating with the same TA is referred to as a UL control carrier (CC) set. Yoo et al. (U.S. 2009/0279495), discloses uplink time alignment between the UE and BS, a random-access procedure is performed via a random-access preamble. ZTE, "Impact analysis of multiple TA", 3GPP TSG RAN WG2#68bis, R2-100308, Valencia, Spain, 18-22, January 2010, discloses PRACH resources may be available on multiple UL CCs

for carrier aggregation and UE try to receive RAR after its transmitted preamble and UL synchronization for the first configured/activated CC in a CC group.

Claims 1, 5, 9 and 13 are allowable because the Prior Art of record, singly or in combination fails to teach the feature of claim(s) limitations in the context of claims 1, 5, 9 and 13 as a whole. Specially, inter alia, it fails to show or render obvious *receiving, at the UE, a Radio Resource Control (RRC) message through a primary Component Carrier (CC), wherein the primary CC belongs to a first uplink (UL) timing group, the RRC message comprises information related to a second UL timing group, which has been set by an evolved Node B (eNB), the second UL timing group includes a secondary CC; receiving, at the UE, information indicating a random access preamble; transmitting, at the UE, the random access preamble according to a non-contention selection, through one or more CCs, each of the one or more CCs transmitting the random access preamble being set as a delegate CC for a respective second UL timing group* as recited in the context of claims 1, 5, 9 and 13. Therefore, the claims are allowable over the cited prior arts.

Claims 2-4, 6-8, 10-12 and 14-16 depend from claims 1, 5, 9 and 13 are allowed since they depend from allowable claims 1, 5, 9 and 13.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAN HUONG TRUONG whose telephone number is (571)270-5829. The examiner can normally be reached on Mon-Fri (7:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, RICKY NGO can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lan-Huong Truong/
Primary Examiner, Art Unit: 2464
12/30/2022

<i>Search Notes</i> 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

CPC - Searched*		
Symbol	Date	Examiner
H04W56/0045; H04W92/10; H04W88/08	09/15/2022	LT
H04L5/001; H04L5/0007	09/15/2022	LT

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
CPC searching performed	09/15/2022	LT
SEARCH PE2E performed	09/15/2022	LT
IEEE, 3GPP and IP searching performed	09/15/2022	LT
Search PE2E updated	12/30/2022	LT
Internet Google Patent search	09/15/2022	LT
Double Patenting searching performed	09/15/2022	LT

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<i>Search Notes</i> 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
US-PGPUB, UPAT	Database Interference Search	12/30/2022	LT
H04W92/10;	H04L5/001;	12/30/2022	LT

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Issue Classification 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

CPC						
Symbol					Type	Version
H04W	/	56	/	0005	F	2013-01-01
H04W	/	76	/	27	I	2018-02-01
H04W	/	56	/	0045	I	2013-01-01
H04L	/	5	/	001	I	2013-01-01
H04W	/	74	/	004	I	2013-01-01
H04L	/	5	/	0007	A	2013-01-01
H04W	/	88	/	08	A	2013-01-01
H04W	/	92	/	10	A	2013-01-01
H04B	/	1	/	7087	A	2013-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 16	
/LAN-HUONG TRUONG/ Primary Examiner, Art Unit 2464 (Primary Examiner) _____ (Date) _____		30 December 2022 O.G. Print Claim(s) Claim 1	O.G. Print Figure Figure 5

Issue Classification 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

INTERNATIONAL CLASSIFICATION			
CLAIMED			
H04W	/	88	/ 08
NON-CLAIMED			
	/		/

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE	Total Claims Allowed:	
(Assistant Examiner)	(Date)	16
/LAN-HUONG TRUONG/ Primary Examiner, Art Unit 2464	30 December 2022	O.G. Print Claim(s) Claim 1
(Primary Examiner)	(Date)	O.G. Print Figure Figure 5

Issue Classification 	Application/Control No. 17/322,832	Applicant(s)/Patent Under Reexamination KWON et al.
	Examiner LAN-HUONG TRUONG	Art Unit 2464

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10												
	2		11												
	3		12												
	4		13												
	5		14												
	6		15												
	7		16												
	8														
	9														

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 16	
/LAN-HUONG TRUONG/ Primary Examiner, Art Unit 2464 (Primary Examiner) _____ (Date) 30 December 2022		O.G. Print Claim(s) Claim 1	O.G. Print Figure Figure 5

☐ 1 - 50

☐ 1. Random Access Response Process in a Wireless Communications

A wireless device transmits a random access preamble with an initial transmission power. The wireless device monitors a control channel on a primary cell for a corresponding random access response. The monitoring is performed within a time frame which starts at a first subframe having a duration...

COMCAST CABLE COMM LLC

US20130258008 ; US Applications ; 2013-10-03 ; 5

☐ 2. Random Access Failure in Wireless Device Multiple Timing Advance Groups

A wireless device receives a control command to transmit a random access preamble on a first secondary cell. The wireless device repeatedly transmits the random access preamble until a random access response corresponding to the random access preamble is received or a predetermined number of...

COMCAST CABLE COMM LLC

US20130188473 ; US Applications ; 2013-07-25 ; 5

☐ 3. Radio Access for a Wireless Device and Base Station

A wireless device configures cell groups comprising a primary cell group and secondary cell group(s). The wireless device receives a control command for transmission of a random access preamble on a first secondary cell. The wireless device receives a random access response on the primary cell. The...

COMCAST CABLE COMM LLC

US20130258862 ; US Applications ; 2013-10-03 ; 5

☐ 4. Random access with primary and secondary component carrier communications

The invention relates to random access procedures in an LTE-system applying carrier aggregation, in particular to support network-initiated random access on secondary cells. A UE transmits a preamble on a random access channel to a radio base station on a secondary cell and receives or detects a...

TELEFON AB LM ERICSSON PUBL

WO201305811A1 ; WIPO Applications ; 2013-01-10 ; 5

☐ 5. Random access failure in wireless device multiple timing advance groups

A wireless device receives a control command to transmit a random access preamble on a first secondary cell. The wireless device repeatedly transmits the random access preamble until a random access response corresponding to the random access preamble is received or a predetermined number of...

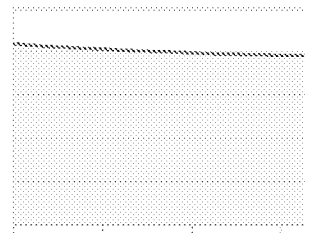
COMCAST CABLE COMM LLC

US8588160 ; US Patents ; 2013-11-19 ; 5

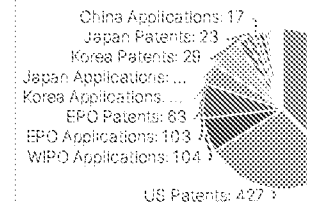
☐ 6. Preamble Transmission in a Wireless Device

A wireless device receives a control message configuring cell groups comprising a primary cell group and a secondary

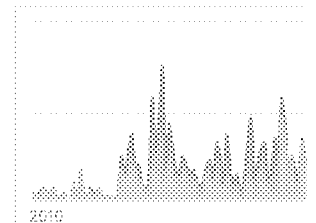
Relevance



Collections



Publication Date



Charts based on top 1500 results

[More V](#)
☐ Result 1

radio resource control AND primary component carrier AND UL timing group AND random access preamble;

About 81,581 results

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Sort by: Relevance Group by: None Deduplicate by: Family Results / page: 10

Random access with preamble transmission



US • [US10027753B2](#) • Esmail Hejazi Dinan • Ofirno, LLC

Priority 2015-07-05 • Filed 2019-01-16 • Granted 2020-11-03 • Published 2020-11-03

claim 11, wherein the instructions, when executed by the one or more processors, further cause the wireless device to: perform an LBT procedure for transmission of a preamble for the random access procedure at a transmission opportunity; and transmit the preamble at the transmission opportunity ...

Starting a Time Alignment Timer Before Receiving an Initial Timing Advance ...

US • [US20210367817A1](#) • Esmail Hejazi Dinan • Ofirno, LLC

Priority 2015-07-05 • Filed 2021-08-06 • Published 2021-11-25

The wireless device of claim 17, wherein the cell group is a timing advance group. 19. The wireless device of claim 2, wherein: the RRC message comprise a time alignment timer information element (IE) indicating a value of the time alignment timer of the cell group; and the value is in terms of a ...

Random access process of an unlicensed cell in a wireless device

US • [US11417134B2](#) • Esmail Dinan • Ofirno, LLC

Priority 2015-07-05 • Filed 2020-10-09 • Granted 2022-08-16 • Published 2022-08-16

A wireless device initiates a random access procedure on an unlicensed cell. A listen-before-talk (LBT) procedure for transmission of a preamble of the random access procedure is performed. In response to the LBT procedure indicating an LBT success, a downlink control channel monitors for a random ...

Wireless device timing advance configuration



WO EP US • [US10120288B2](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC

Priority 2012-04-01 • Filed 2015-12-11 • Granted 2018-11-06 • Published 2018-11-06

a secondary cell group index associated with a secondary cell group of the at least one secondary cell group, wherein the secondary time alignment timer value is associated with the secondary cell group indicated by the secondary cell group index, and wherein the secondary time alignment timer ...

Apparatus and method for setting up uplink synchronization in a wireless ...

WO EP US CN JP KR • [JP6175666B2](#) • パンテックインコーポレイテッド Pantech Inc.

Priority 2010-02-15 • Filed 2015-08-04 • Granted 2017-08-02 • Published 2017-08-02

Information on a component carrier set used by the user terminal is received from a base station through a main component carrier by radio resource control (RRC), and system information on component carriers of the component carrier set is based on information on the component carrier set.

Random access mechanism for a wireless device and base station



US • [US10233472B2](#) • Esmail Hejazi Dinan • Comcast Cable Communications, LLC

Priority 2012-04-01 • Filed 2019-07-09 • Granted 2021-03-02 • Published 2021-03-02

based on the wireless device receiving the timing advance command, starting or restarting a first time alignment timer corresponding to the first cell group. 32. The method of claim 26, further comprising determining that the first cell group is: out-of-sync, if a first time alignment timer has ...

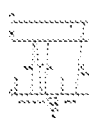
Uplink transmission timing advance in a wireless device and base station

US • [US2021036682](#) • Esmail Hejazi Dinan • Ofirno Technologies, LLC

Priority 2012-04-01 • Filed 2015-01-12 • Granted 2016-08-09 • Published 2016-08-09

a) uplink transmissions in said primary cell group employ a first synchronization signal transmitted on said primary cell as a primary timing reference; and b) said second subset comprises a reference secondary cell, uplink transmissions in said secondary cell group employing a second ...

Random access in a wireless device and wireless network



US • [US10661733B2](#) • Alireza Bahaai • Ofirno, LLC

Priority 2016-12-16 • Filed 2017-12-18 • Granted 2020-06-09 • Published 2020-06-09

1. A method comprising: receiving, by a wireless device from a first base station, at least one first message comprising: configuration parameters for a plurality of cells comprising a plurality of cell groups comprising a first cell group for communication with the first base station; and a ...

Random access response of an uplink bandwidth part of a cell

WO EP US CN JP KR AU CA DK ES FI HU PL • US11264422B2 • Hua Zhou • Ofinno, Llc
Priority 2017-11-09 • Filed 2020-08-21 • Granted 2022-03-22 • Published 2022-03-22

first memory storing first instructions that, when executed by the one or more first processors, cause the wireless device to: transmit a preamble via a **random** access channel of a first uplink bandwidth **part** of a cell; determine a **random** access radio network temporary identifier (RA-RNTI) based on:

Random access response reception for a two-step random access procedure

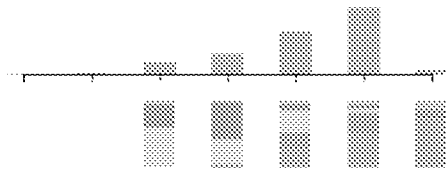
US • US11412550B2 • Hyeongsuk Jeon • Ofinno, Llc

Priority 2019-05-02 • Filed 2020-05-01 • Granted 2022-08-09 • Published 2022-08-09

claim 10, wherein the instructions, when executed by the one or more processors, further cause the wireless device to receive **random** access configuration parameters for a two-step **random** access procedure, the **random** access configuration parameters indicating: at least one **random** access channel for ...

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	37	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 12:10 AM
L2	12	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 12:10 AM
L3	6	("20080273610" "20090186613" "20090279495").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:16 AM
L4	8	("20090274120" "2010041399" "20100111005").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:24 AM
L5	216	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:32 AM
L6	43	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (terminal OR UE OR (user adj equipment)) and (CC OR carrier)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:33 AM
L7	3922	(370/350).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:38 AM
L8	21823	(370/329).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:38 AM
L9	2840	(370/330).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:38 AM
L10	2474	(370/337).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:39 AM
L11	2290	(370/345).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:39 AM

L12	3023	(370/347).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:39 AM
L13	4	("20090005058").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:44 AM
L14	3	("20090116434").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:45 AM
L15	42	("2009/0116434").URP N.	(USPAT)	OR	ON	ON	2014/01/12 12:48 AM
L16	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH delegat\$3 NEAR3 (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:51 AM
L17	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH delegat\$3	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:52 AM
L18	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) WITH delegat\$3	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:52 AM
L19	8	delegat\$3 NEAR CC	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:53 AM
L20	2	delegat\$3 NEAR (component adj carrier)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:54 AM
L21	74	L5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:56 AM
L22	1	L5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/01/12 12:57 AM

		AND delegate	IBM_TDB)				
L23	13	set\$4 WITH (CC OR (component adj carrier)) NEAR9 aggregation NEAR4 information	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 09:39 AM
L24	2	("20120021756" "20120057490").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/12 09:42 AM
L27	2	("20110267957").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 09:49 AM
L28	3	("20090092091").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 09:50 AM
L30	7	("2010148532").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 10:06 AM
L31	9068	(UL OR uplink) WITH (sync OR synchronization)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 11:52 AM
L32	61	(UL OR uplink) WITH (sync OR synchronization) WITH receiv\$3 NEAR3 (random near access near preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 11:53 AM
L33	2	("2010/0331003").URP N.	(USPAT)	OR	ON	ON	2014/01/12 11:57 AM
L35	2	("20090316642").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:13 PM
L37	20	("20030096631" "20100331003" "20060166688" "20070072600" "7054298" "20040077357" "20090186613").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/12 12:23 PM
L38	7	("2006/0166688").URP N.	(USPAT)	OR	ON	ON	2014/01/12 12:46 PM
L46	2	("20090239583").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/13 01:58 PM
L47	21	("20070133611" "20120057525" "20050099986" "20030125073" "20120135715" "20090239582" "20090239583" "20120004013").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/13 02:00 PM

L50	3	("20100080155").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2014/01/13 02:19 PM
L51	11	("2010/0182992").URP N.	(USPAT)	OR	ON	ON	2014/01/13 02:25 PM
L52	2	"US 20130034087"	(US-PGPUB; USPAT; USOCR; DERWENT)	OR	ON	ON	2014/01/13 02:38 PM
L53	304	(establish\$3 OR creat\$3) WITH (UL OR uplink) NEAR3 (sync OR synchronization) and (select\$3 OR pick\$3 OR choos\$3) WITH (UE OR mobile near station OR user near equipment)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 11:41 AM
L54	3925	(370/350).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 11:46 AM
L55	20	L53 and L54	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 11:48 AM
L56	5	L53 and L54 and (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 01:43 PM
L57	15	("20080060249" "20080 305822" "20070230394 " "20080119979" "2007 0000967" "2007025465 6").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 01:46 PM
L58	2	"delegate component carrier"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 03:19 PM
L60	5	"delegate CC"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 03:20 PM
L61	21	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing and (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/14 03:38 PM
L62	276	set\$4 WITH (CC OR (component adj carrier))	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:34 AM

		WITH characteristic					
L63	1	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH UL NEAR3 synchronization	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:35 AM
L64	4	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH synchronization	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:35 AM
L66	31	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH state	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:36 AM
L67	256	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 09:38 AM
L68	1007	(370/324).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:39 AM
L69	0	L62 and L68	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:40 AM
L70	21847	(370/329).CCLS.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:40 AM
L71	10	L62 and L70	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:40 AM
L72	3	("2011/0292887").URP N.	(USPAT)	OR	ON	ON	2014/01/15 09:51 AM
L73	3	("2011/0292887").URP N.	(USPAT)	OR	ON	ON	2014/01/15 09:56 AM
L74	2	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212" and establish\$3 near3 uplink	(US-PGPUB; USPAT)	OR	ON	ON	2014/01/15 10:04 AM
L75	2	("2012/0063425").URP N.	(USPAT)	OR	ON	ON	2014/01/15 10:04 AM
L76	2	("13556165").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/01/15 10:16 AM

IPR2023-01269

			IBM_TDB)				
L78	13343	retransmission near data	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 10:56 AM
L80	357	retransmission near data WITH receive\$3 NEAR4 terminals	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 11:00 AM
L81	21	retransmission near data WITH receive\$3 NEAR4 terminals WITH threshold	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 11:00 AM
L83	4	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (terminal OR UE OR (user adj equipment)) and (CC OR carrier) WITH characteristic	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 07:59 PM
L86	2	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH macro	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 09:58 PM
L87	11	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (threshold OR predetermin\$3 OR predefin\$3 OR preset\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/15 10:00 PM
L88	1308	form\$3 WITH timing near synchronization	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/16 10:13 AM
L89	13	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/01/16 10:14 AM
L90	4	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/01/16 11:03 AM

		(information OR message OR data) WITH (UL OR uplink) NEAR4 timing NEAR20 (simultaneously OR concurrently)	IBM_TDB)				
L91	4	("2008/0037502").URP N.	(USPAT)	OR	ON	ON	2014/01/16 11:12 AM
L94	62	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "201301662").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:19 PM
L95	62	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "201301662").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:20 PM

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L97	22	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "20120188897" "20100227569" "20120307811" "8031662").PN. and timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:20 PM
L98	4	("20110299489" "20120113941" "20120300743" "20120076103" "20130078913" "20130094466" "20110268032" "20120113914" "20120113962" "20130094433" "20120113962" "20120250520" "20120300743" "20120224552" "20130072246" "20070189205" "20110261776" "20110268032" "20120076103" "20120008600" "20120243498" "20120250520" "20130010704" "20130084913" "20070189205" "20120008600" "20120307811" "20120113941" "20070293224" "20110261776" "20120243498" "20100227569" "20110299489" "20120113914" "20120077484" "	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 05:21 PM

		20120188897 "20100227569 "20120307811 "8031662").PN. and timing WITH synchron\$5					
L99	44	("2007/0293224").URP N.	(USPAT)	OR	ON	ON	2014/02/15 05:23 PM
L100	17	("2012/0250520").URP N.	(USPAT)	OR	ON	ON	2014/02/15 09:09 PM
L101	17	("2012/0250520").URP N.	(USPAT)	OR	ON	ON	2014/02/15 09:13 PM
L102	13	("20100158147 "20110038271 "20110243016 "20100273515 "20090163211 "20090163211 "20090318180").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 09:41 PM
L103	435	("20080101268 "20060067364 "20050094670 "20060209870 "20040014452 "20080043619 "20050141541 "20060203760 "20060218271 "20080064390 "20080310452 "20090143074 "20090163199 "20110039536 "20050176430 "20080267126 "20020091860 "20030007490 "20080089292 "7916697 "20080287091 "20060187846 "20070206531 "7912471 "20050288022 "20060087994 "7245707 "7551643 "20050164719 "20060098688 "20060251105 "7912471 "20090092076 "20080089285 "20100272004 "20110116436 "7958542 "20070155389 "20080188223 "20080285691 "20100238903 "20040242195 "20090264164 "20030165122 "20040148427 "20070155390 "20090124259 "20100238799 "20090005051 "20070177569 "20060126554 "20050041610 "20030123485 "20070248075 "6567409 "20050085254 "20070291673 "20070258591 "20050232271 "20080076359 "2010030	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 10:47 PM

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L104	75	("20080101268" "20060 067364" "20050094670 " "20060209870" "2004 0014452" "2008004361 9" "20050141541" "200 60203760" "200602182 71" "20080064390" "20 080310452" "20090143 074" "20090163199" "2 0110039536" "2005017 6430" "20080267126" " 20020091860" "200300 07490" "20080089292" " "7916697" "200802870 91" "20060187846" "20 070206531" "7912471" " "20050288022" "20060 087994" "7245707" "75 51643" "20050164719" " "20060098688" "20060 251105" "7912471" "20 090092076" "20080089 285" "20100272004" "2 0110116436" "7958542 " "20070155389" "2008 0188223" "2008028569 1" "20100238903" "200	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/02/15 10:51 PM

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		uplink					
L106	44	("2007/0293224").URP N.	(USPAT)	OR	ON	ON	2014/02/15 11:15 PM
L107	15703	H04W72/04.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:47 PM
L108	230	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:47 PM
L109	6136	H04W72/00.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:48 PM
L111	1564	H04B7/216.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:48 PM
L112	7	L107 and L108	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:48 PM
L114	3	L109 and L108	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/05/19 01:49 PM
L115	260	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT)	OR	ON	ON	2014/05/19 01:52 PM
L116	2	("20120307821").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/27 11:56 PM
L117	1	("20120307821").PN.	(DERWENT)	OR	ON	ON	2014/06/27 11:56 PM
L118	3	("20130121264").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/28 10:01 PM
L119	31095	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:29 AM
L120	31048	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2014/06/29 12:30 AM

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			IBM_TDB)				
L121	885	(H04B1/7087).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:31 AM
L122	343	(establish\$3 OR creat\$3) WITH (UL OR uplink) NEAR3 (sync OR synchronization) and (select\$3 OR pick\$3 OR choos\$3) WITH (UE OR mobile near station OR user near equipment)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:31 AM
L123	53	L119 and L122	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:31 AM
L124	19	L120 and L122	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:32 AM
L125	2	L121 and L122	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:32 AM
L126	2	("20090186613").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2014/06/29 01:17 AM
L127	14	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing and (CC OR (component adj carrier)) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 09:56 AM
L128	9	("20030076812" "20090 161599" "20090290555 " "20090316642").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 10:03 AM
L129	31136	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:22 PM
L130	12	(UL OR uplink) NEAR4 timing WITH distinguished and (@pd OR @ptad OR @prad	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:28 PM

		OR @ad OR @rlad)<"20100212"					
L131	165	(UL OR uplink) NEAR4 timing WITH error and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:32 PM
L132	15	L129 and L131	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/06/29 12:33 PM
L133	26	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (RACH OR random NEAR access NEAR channel)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/07 10:46 PM
L134	0	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH (RACH OR random NEAR access NEAR channel) WITH response	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/07 11:05 PM
L135	46	("20100260156" "8077671" "20070015511" "8274947" "20110103347" "7450944" "20100142485" "20090046665" "20100056160" "20100003981" "20120177006" "5440561" "20090070469" "20020160779" "7469142" "20030053431" "20030147370" "20100278150").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/07 11:09 PM
L136	19	("2010/0142485").URP N.	(USPAT)	OR	ON	ON	2014/12/07 11:15 PM
L137	13	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH contention	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2014/12/16 11:47 AM
L138	75	(transmit\$3 OR send\$3)	(US-PGPUB; USPAT;	OR	ON	ON	2014/12/16 11:26 AM

		WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) WITH contention	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				11:49 AM
L139	51	(component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2015/01/13 11:31 AM
L140	47	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 12:46 PM
L141	1	("2012/0108254").URP N.	(USPAT)	OR	ON	ON	2015/01/13 01:26 PM
L142	14	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:28 PM
L162	41	("20090116434" "20090 274120" "8606336" "20 110170495" "20090318 175" "20100086065" "2 0100238857" "2010032 3744" "20100041399" " 20090270094" "200903 16642" "20100111005" " 20100118720").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2015/01/13 01:51 PM
L177	2316	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 11:59 AM
L178	421	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:04 PM
L179	421	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:05 PM
L180	230	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:05 PM
L181	185	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:06 PM

		advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink)					
L182	169	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:07 PM
L183	3	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency)) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:08 PM
L184	9	("20030076812" "20090 161599" "20090290555 " "20090316642").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 12:17 PM
L185	2	tim\$4 NEAR3 group SAME (calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/12 03:08 PM
L186	50	("2012/0307811").URP N.	(USPAT)	OR	ON	ON	2016/12/12 03:18 PM
L187	17	("20070189205" "20100 227569" "20110261776 " "20110268032" "2011 0299489" "2012011394	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/14 04:27 PM

		1 "20120300743 "20120307811").PN.					
L188	3	("8982805").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/14 04:47 PM
L189	34	("20110039593 "20110159903 "20110045837 "20110243048 "20090279495 "20100232382 "20110026475 "20110243106 "20080310395 "20100177747 "20110235609 "20110317777 "20100296467 "20110134774 "20070293224").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/14 05:02 PM
L190	182	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR2 preamble) AND synchroniz\$4 NEAR2 (UL OR uplink) AND (carrier OR CC OR (common component ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/16 11:58 AM
L191	180	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR2 preamble) AND synchroniz\$4 NEAR2 (UL OR uplink) SAME (carrier OR CC OR (common component ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/16 11:58 AM
L192	0	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced)) SAME (random NEAR2 access NEAR2 preamble) AND synchroniz\$4 NEAR2 (UL OR uplink) SAME (carrier OR CC OR (common component ADJ carrier) OR (carrier ADJ frequency)) and (@pd OR @ptad OR @prad	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/16 11:58 AM

		OR @ad OR @rlad)<"20100210"					
L193	243	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:36 AM
L194	178	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:36 AM
L195	185	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:37 AM
L196	204	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR4 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:37 AM
L197	196	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2016/12/19 11:38 AM

		OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR2 (UL OR uplink)	IBM_TDB)				
L198	1	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) NEAR5 value SAME (random NEAR2 access NEAR2 (preamble OR response)) AND synchroniz\$4 NEAR2 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:38 AM
L199	17	("20080002660" "20140293853" "20140073337" "20160100374" "20080279131" "20130116002").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 11:39 AM
L200	6	(calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (random ADJ access ADJ response) NEAR5 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 12:11 PM
L201	10	("20100238908" "20110243111" "20120063425" "20120099577").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 12:13 PM
L202	120	random ADJ access NEAR2 (response OR reply) SAME timing NEAR2 advanc\$3 AND @ad<"20100210" AND (calculat\$4 OR comput\$3 OR determin\$3 OR estimat\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 01:18 PM
L203	42	random ADJ access NEAR2 (response OR reply) SAME timing NEAR2 advanc\$3 AND @ad<"20100210" AND (calculat\$4 OR comput\$3 OR determin\$3 OR	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 01:19 PM

		estimat\$3) WITH timing NEAR2 advanc\$3					
L204	2533	(H04J3/00).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/19 03:12 PM
L205	2	("20150271770").PN.	(US-PGPUB; USPAT; USOCR; DERWENT)	OR	ON	ON	2016/12/20 09:10 AM
L206	56	delegat\$3 NEAR2 (carrier OR CC OR CCs)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 11:59 AM
L207	26	delegat\$3 NEAR2 (carrier OR CC OR CCs) AND synchronization	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 12:00 PM
L208	6	("20080273610" "20090 186613" "20090279495 ").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 12:09 PM
L209	3	("20100118720").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/24 12:20 PM
L210	148	set\$4 WITH (CC OR (component adj carrier)) WITH characteristic AND ((UL NEAR PCC) OR Pcell OR primary) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/24 02:16 PM
L211	309	set\$4 WITH (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:02 AM
L212	8428	(CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:03 AM
L213	561	(TA OR timing ADJ advanced) SAME (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:04 AM

		@rlad)<"20100212"					
L214	10	(calculat\$3 OR comput\$4 OR estimat\$4) SAME (TA OR timing ADJ advanced) SAME (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/25 12:05 AM
L215	2	("20100222059").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/26 02:02 AM
L216	34	("2010/0222059").URP N.	(USPAT)	OR	ON	ON	2016/12/26 02:06 AM
L217	9	set\$4 WITH (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) AND tim\$3 ADJ2 group and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/26 01:11 PM
L218	2	("20100142485").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2016/12/26 03:28 PM
L219	0	WO2009079913	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/26 11:16 PM
L220	5	"2009079913"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2016/12/26 11:16 PM
L221	64	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 09:54 AM
L222	21	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 09:54 AM
L232	61	("20090116434" "20090 274120" "20100177747 "20090270094" "2010 0041399" "2010011872 0" "20080002660" "200 80188219" "201001424 85" "20090316642" "20 090318175" "20100238 857" "8606336" "20100 111005" "20100323744 "20100238872" "2012 0008600" "2009027949	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2017/08/18 04:08 PM

		5 "20100086065 "20110170495 "20080268850").PN.					
L233	574	(TA OR timing ADJ advanced) SAME (CC OR (component adj carrier)) AND ((UL NEAR PCC) OR Pcell OR primary NEAR cell) and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 06:26 PM
L234	2976	(H04J3/00).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 10:30 PM
L235	5	("9854545").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2018/11/09 11:14 PM
L236	539	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 11:47 PM
L237	4191	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 11:48 PM
L238	1	L234 AND L237	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2018/11/09 11:50 PM
L239	3	("9054835").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2018/11/09 11:52 PM
L240	3	("9054835").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/06/05 07:05 AM
L241	41	("20090116434 "20090274120 "8606336 "20110170495 "20090318175 "20100086065 "20100238857 "20100323744 "20100041399 "20090270094 "20090316642 "20100111005 "20100118720").PN.	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/06/05 08:36 AM
L242	3121	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/05 08:38 AM

L243	697	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) NEAR2 primary SAME (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/05 08:45 AM
L244	55	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) NEAR2 primary SAME (RRC OR (radio ADJ resource ADJ control)) SAME timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/05 08:46 AM
L245	0	random ADJ access NEAR2 (response OR reply) SAME timing NEAR2 groups AND @ad<"20100210" AND (calculat\$4 OR comput\$3 OR determin\$3 OR estimat\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:22 AM
L246	0	(RAP OR (random ADJ access ADJ preamble)) NEAR5 (response OR reply) SAME ((CC carrier) NEAR2 (second secondary other another)) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:30 AM
L247	5	(RAP OR (random ADJ access ADJ preamble)) SAME ((CC carrier) NEAR2 (second secondary other another)) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:32 AM
L248	7568	timing NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:39 AM
L249	17	timing NEAR2 advanced SAME tim\$3 NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/26 08:40 AM
L250	586	(transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/06/27 11:44 PM
L251	6	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 12:20 PM

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		(information OR message OR data) SAME (UL OR uplink) NEAR3 (tim\$3 timing) WITH delegat\$3 NEAR3 (CC OR (component adj carrier))					
L252	10	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5 (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) WITH delegat\$3 NEAR3 (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 12:35 PM
L253	196	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5 (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) WITH (CC OR (component adj carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 02:55 PM
L254	30	(forward\$3 OR transmit\$3 OR send\$3) WITH (SYNC OR synchroniz\$5) NEAR5 (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) WITH (CC OR (component adj carrier)) NEAR2 (primary CC1 CC2 secondary other another)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 03:26 PM
L255	77	("2013/0250925").URP N.	(USPAT)	OR	ON	ON	2019/07/09 03:29 PM
L256	308	(forward\$3 OR transmit\$3 OR send\$3) WITH (information OR message OR data) AND (UL OR uplink) NEAR3 (tim\$3 timing) SAME (CC OR (component adj carrier)) NEAR2 (primary CC1 CC2 secondary other another)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/09 04:58 PM
L257	4	("20120008600").PN.	(US-PGPUB; USPAT;	OR	ON	ON	2019/07/09

			USOCR; FPRS; JPO; DERWENT)				05:34 PM
L258	16731	carrier ADJ2 aggregation AND timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:39 PM
L259	505	RACH SAME carrier ADJ2 aggregation AND timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:40 PM
L261	141	RACH SAME carrier ADJ2 aggregation AND timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:41 PM
L262	141	RACH SAME (CC1 CCs CC2 carriers) ADJ2 aggregation AND timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:41 PM
L263	636	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation AND timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:42 PM
L264	292	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation SAME timing NEAR2 groups	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:43 PM
L265	291	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation SAME timing NEAR2 groups AND timing NEAR2 advance	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:43 PM
L266	257	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2 aggregation SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:44 PM
L267	309	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:44 PM
L268	205	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:45 PM

		(carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)					
L269	5	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance) AND second ADJ timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:46 PM
L270	13	("20110243111" "20110243102" "20120099577" "20120250520" "20120300715" "20120294272" "20110243102").PN.	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2019/07/09 05:50 PM
L271	2	("20120300715").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/09 06:12 PM
L272	74	("2012/0300715").URP N.	(USPAT)	OR	ON	ON	2019/07/09 06:12 PM
L273	3	delegat\$3 SAME (component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 01:56 PM
L274	6	("20080273610" "20090186613" "20090279495").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 02:33 PM
L275	165	(TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 11:46 PM
L277	13	(TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND (UL uplink) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 11:48 PM
L278	6	(TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND (UL uplink) AND (RACH OR (random ADJ access)) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/23 11:49 PM
L279	2	("20080267165").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/24 08:45 AM
L280	4	("20120008600").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO;	OR	ON	ON	2019/07/24 11:49 PM

			DERWENT)				
L281	3	("9054835").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/24 11:52 PM
L282	5	("9854545").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2019/07/24 11:59 PM
L283	60	timing AND (component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:40 PM
L284	67	timing AND (component NEAR carrier AND (primary NEAR2 CC)).clm.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:40 PM
L285	2491	timing AND (component NEAR carrier AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:49 PM
L286	89	updat\$3 NEAR2 timing AND (component NEAR carrier AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:49 PM
L287	10	updat\$3 NEAR2 timing NEAR2 group AND (component NEAR carrier AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:49 PM
L288	12348	updat\$3 NEAR2 timing NEAR2 group aggregat\$3 NEAR2 carrier AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 02:51 PM
L291	109	updat\$3 NEAR2 timing NEAR2 group	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 03:04 PM
L292	12	updat\$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2019/07/26 03:05 PM
L293	2	("20200145949").PN.	(US-PGPUB; USPAT; USOCR; DERWENT)	OR	ON	ON	2020/08/26 09:41 PM
L294	152373	(H04W56/0005 or H04W76/27 or H04W74/004 or H04W56/0045 or H04W88/08 or H04W92/10 or H04W56/0015 or H04W74/08).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/26 10:12 PM
L295	108349	(H04L5/001 or H04L5/0007).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2020/08/26 10:12 PM

			JPO; DERWENT; IBM_TDB)				
L296	1453	(H04B1/7087).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/26 10:12 PM
L297	80	((("KWON") near3 ("Kibum"))).INV.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/08/26 10:13 PM
L298	28	((("JUNG") near3 ("Myungcheul"))).INV.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/08/26 10:13 PM
L299	3343	timing AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:05 PM
L300	3491	(TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:05 PM
L301	157	(TA timing) SAME ((CC2 CC2 CCs (component NEAR carrier)) SAME (primary NEAR2 CC))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:05 PM
L302	55	("20080232316" "20110 013581" "20050053029 "8125948" "20110075 629" "20110098074" "2 0100240372" "2011000 3555" "20110261714" " 7782899" "2005005302 9" "20080212556" "201 10122794" "201201478 30" "20110268032" "20 060034204" "20080232 316" "20100130218" "2 0110142009" "2011023 5609" "20100302964" " 20100227569" "201002 85809" "20120218987") .PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 12:26 PM
L303	3	("20120099577").PN.	(US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT)	OR	OFF	OFF	2020/08/27 12:35 PM
L304	11	("2012/0099577").URP N.	(USPAT)	OR	ON	ON	2020/08/27 12:41 PM
L305	10	("20100238908" "20110 243111" "20120063425 "20120099577").PN.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/08/27 02:02 PM
L306	80	((KIBUM) near2 (KWON)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 12:29 AM
L307	28	((MYUNGCHEUL) near2 (JUNG)).INV.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 12:29 AM

L308	12975	H04W72/00.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 12:34 AM
L309	3310	(H04J3/00).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 12:35 AM
L310	159786	(H04W56/0005 or H04W76/27 or H04W74/004 or H04W56/0045 or H04W88/08 or H04W92/10 or H04W56/0015 or H04W74/08).cpc.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 12:35 AM
L311	40	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:03 AM
L312	13	updat\$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:04 AM
L313	9	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 01:09 AM
L314	115654	RRC ANDdelegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 01:09 AM
L315	9	((radio ADJ resource ADJ control) OR RRC) AND delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 01:09 AM
L316	7	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink) AND ((radio ADJ resource ADJ control) OR RRC) AND RAP	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:11 AM
L317	17	(RAP OR random ADJ	(US-PGPUB; USPAT;	OR	ON	ON	2020/12/18

		access ADJ preamble) AND (creat\$3 form\$3) WITH timing near4 synchronization NEAR7 (UL OR uplink)	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:12 AM
L318	3	(apply obtain\$3) NEAR5 (TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND (UL uplink) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:14 AM
L319	60393	(H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:20 AM
L320	2181	H04B7/216.CPC.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:20 AM
L321	279	RAP AND (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2020/12/18 01:22 AM
L337	9	((timing ADJ2 advanced) OR TA) AND delegat\$3 NEAR2 CC AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 10:55 AM
L338	9	delegat\$3 NEAR2 CC AND (TA timing) AND (((second secondary) ADJ2 CC) CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2020/12/18 11:02 AM
L339	390	(SYNC OR synchroniz\$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing AND (transmit\$3 OR send\$3) WITH (CC OR (component ADJ carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 10:48 AM
L340	11	(((second secondary) ADJ2 CC) CC2 CC2 CCs (component NEAR carrier)) AND delegat\$3 NEAR2 CC AND (TA	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2022/09/16 10:54 AM

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		timing) AND (primary NEAR2 CC)) AND UL NEAR2 timing					
L341	10797	(CC1 CC-1 (primary NEAR2 CC)) AND (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 10:59 AM
L342	4825	(CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L343	1363	(CC1 CC-1 (primary NEAR2 CC)) NEar7 (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L344	1111	(CC1 CC-1 (primary NEAR2 CC)) NEar5 (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L345	803	(CC1 CC-1 (primary NEAR2 CC)) NEar5 (TA OR tim\$7 OR timing) NEAR5(CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:00 AM
L346	76	L319 AND L345	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:01 AM
L347	40	tim\$3 NEAR2 groups AND (TA OR tim\$4 NEAR2 advanced) SAME (UL uplink) AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/16 11:34 AM
L348	20	"11012954"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2022/09/17 04:31 PM

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			VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L349	77	(CC1 CCs CC2 AND (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance) AND second ADJ timing AND (RA (random ADJ access) RACH)	(US-PGPUB; USPAT; FPRS; EPO; DERWENT)	OR	ON	ON	2022/12/30 02:46 PM
L350	40	(TA OR tim\$4 NEAR2 advanced) SAME (UL uplink) AND tim\$3 NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:47 PM
L351	9	(UL uplink) AND (TA OR tim\$4 NEAR2 advanced) SAME tim\$3 NEAR2 groups AND @ad<"20100210"	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:47 PM
L352	836	updat\$3 NEAR2 (TA OR (timing NEAR2 group)) AND (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:47 PM
L353	74	updat\$3 NEAR2 (TA OR (timing NEAR2 group)) SAME (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:48 PM
L354	1222	(updat\$3 up\$2dat\$3 correct\$3 revis\$3 amend\$3 reconcil\$3 replace\$3 replac\$3 edit\$3 chang\$3 edit\$3) NEAR2 (TA OR (timing NEAR2 group)) SAME (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:49 PM
L355	23	L109 AND (updat\$3 up\$2dat\$3 correct\$3 revis\$3 amend\$3 reconcil\$3 replace\$3 replac\$3 edit\$3 chang\$3 edit\$3) NEAR2 (TA OR (timing NEAR2 group)) SAME (primary NEAR2 CC OR PCELL)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:51 PM
L356	0	L111 AND (updat\$3 up\$2dat\$3 correct\$3 revis\$3 amend\$3 reconcil\$3 replace\$3 replac\$3 edit\$3 chang\$3 edit\$3)	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 02:51 PM

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		NEAR2 (TA OR (timing NEAR2 group)) SAME (primary NEAR2 CC OR PCELL)					
L357	18	(random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:31 PM
L358	232	(CC OR (component ADJ carrier)) SAME RAP AND (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:33 PM
L359	0	L353 AND (CC OR (component ADJ carrier)) SAME RAP AND (RRC OR (radio ADJ resource ADJ control))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:33 PM
L360	1708	RRC AND (CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:34 PM
L361	816	UL NEAR2 grant AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/12/30

		RRC AND (CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				04:34 PM
L362	376	UL NEAR2 grant SAME RRC AND (CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:35 PM
L363	193	UL NEAR2 grant SAME RRC AND (CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) NEAR3 group SAME (CC2 CC2 CCs (component NEAR carrier))	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:35 PM
L364	28	delegate NEAR2 CC AND RRC AND ((TA NEAR2 value) OR (tim\$4 NEAR2 advanced)) AND (UL uplink) AND (tim\$3 NEAR2 groups)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/12/30 04:42 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N143	3665	(370/350).CCLS.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:08 AM
N144	51	(component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:31 AM
N145	7	uplink NEAR timing NEAR group.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:31 AM
N146	22	UL NEAR group.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:31 AM
N147	83	synchronization NEAR request NEAR message.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:32 AM

N148	9	N143 AND N147	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:34 AM
N149	2	N146 AND N147	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:36 AM
N150	1	N144 AND N147	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:36 AM
N151	5348	uplink AND synchronization.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:37 AM
N152	646	N143 AND N151	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:40 AM
N153	1	N146 AND N152	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:40 AM
N154	1	N147 AND N152	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:40 AM
N155	3	UL NEAR timing NEAR group.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:42 AM
N156	15	(component NEAR carrier AND (primary NEAR CC) AND (second NEAR CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 11:44 AM
N157	3	delegate ADJ CC.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:32 PM
N158	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:32 PM
N159	1	N147 AND N158	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:33 PM
N160	10	N144 AND N158	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:33 PM
N161	64	(primary ADJ CC) AND (radio NEAR resource NEAR control) AND timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 01:34 PM
N163	8801	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:00 PM
N164	213	(H04B1/7087).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:00 PM
N165	8686	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:00 PM
N166	3665	(370/350).CCLS.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM
N167	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM
N168	7	N163 AND N167	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM
N169	86	N167 AND N167	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:01 PM

N170	56	N165 AND N167	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:02 PM
N171	5348	uplink AND synchronization.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:04 PM
N172	431	N163 AND N171	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:04 PM
N173	3	N167 AND N172	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:04 PM
N174	8686	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:31 PM
N175	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:32 PM
N176	56	N174 AND N175	(US-PGPUB; USPAT)	OR	ON	ON	2015/01/13 03:32 PM
N223	15660	(H04L5/001 OR H04L5/0007).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 10:49 AM
N224	275	uplink AND timing NEAR advance NEAR value.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 10:50 AM
N225	12	uplink AND timing NEAR advance NEAR value AND RAR.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 10:50 AM
N226	5	uplink NEAR timing AND TA NEAR value AND RAR.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:02 AM
N227	93	(component NEAR carrier AND (primary NEAR CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:20 AM
N228	236	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:20 AM
N229	0	N223 AND N224 AND N228	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:20 AM
N230	21	N223 AND N224	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:21 AM
N231	3	N224 AND N228	(US-PGPUB; USPAT)	OR	ON	ON	2017/04/20 11:21 AM
N322	6	form\$3 WITH timing near4 synchronization NEAR7 (UL OR uplink).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:04 AM
N323	85	(TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:04 AM
N324	6	updat\$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:04 AM

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N325	6	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:08 AM
N326	9	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:08 AM
N327	8	delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:09 AM
N328	8	((radio ADJ resource ADJ control) OR RRC) AND delegat\$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:10 AM
N329	5	(RAP OR random ADJ access ADJ preamble) AND (creat\$3 form\$3) WITH timing near4 synchronization NEAR7 (UL OR uplink).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:12 AM
N330	523	H04B7/216.CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:20 AM
N331	761	(H04J3/00).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:20 AM
N332	42755	(H04W56/0005 or H04W76/27 or H04W74/004 or H04W56/0045 or H04W88/08 or H04W92/10 or H04W56/0015 or H04W74/08).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:21 AM
N333	40	(receiv\$3 get\$4) SAME (CC OR (component adj carrier)) NEAR2 primary SAME (RRC OR (radio ADJ resource ADJ control)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 01:21 AM
N336	11	RAP AND (CC OR	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18

		(component adj carrier) SAME (RRC OR (radio ADJ resource ADJ control)).clm.					01:22 AM
N339	8	((timing ADJ2 advanced) OR TA) AND delegat\$3 NEAR2 CC AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/12/18 10:57 AM
N340	0	L109 AND (updat\$3 up\$2dat\$3 correct\$3 revis\$3 amend\$3 reconcil\$3 replace\$3 replac\$3 edit\$3 chang\$3 edit\$3) NEAR2 (TA OR (timing NEAR2 group)) SAME (primary NEAR2 CC OR PCELL).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:30 PM
N341	271	(establish\$3 OR creat\$3) WITH (UL OR uplink) NEAR3 (sync OR synchronization) AND (select\$3 OR pick\$3 OR choos\$3) WITH (UE OR mobile NEAR station OR user NEAR equipment).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:30 PM
N342	5	(random NEAR2 access NEAR3 preamble) AND synchroniz\$4 NEAR4 (UL OR uplink) AND (calculat\$3 OR estimat\$3 OR comput\$4) WITH (TA OR (timing NEAR advanced) OR timing NEAR2 group) SAME (CC OR (commponent ADJ carrier) OR (carrier ADJ frequency)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:32 PM
N343	39	(CC OR (component ADJ carrier)) SAME RAP AND (RRC OR (radio ADJ resource ADJ control)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:32 PM
N344	5	UL NEAR2 grant SAME RRC AND (CC1 CC-1 (primary NEAR2 CC)) SAME (TA OR tim\$7 OR timing) NEAR3 group SAME (CC2 CC2	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:35 PM

		CCs (component NEAR carrier)).clm.					
N345	805	(TA OR tim\$4 NEAR2 advanced) SAME (UL uplink) AND tim\$3 NEAR2 groups .clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:39 PM
N346	906	(TA OR tim\$4 NEAR2 advanced) AND (UL uplink) AND tim\$3 NEAR2 groups .clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:39 PM
N347	838	RRC AND (TA OR tim\$4 NEAR2 advanced) AND (UL uplink) AND (tim\$3 NEAR2 groups) .clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:40 PM
N348	580	RRC AND ((TA NEAR2 value) OR (tim\$4 NEAR2 advanced)) AND (UL uplink) AND (tim\$3 NEAR2 groups) .clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:40 PM
N349	13	delegate NEAR2 CC AND RRC AND ((TA NEAR2 value) OR (tim\$4 NEAR2 advanced)) AND (UL uplink) AND (tim\$3 NEAR2 groups) .clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/12/30 04:41 PM

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Capitol IP Law Group, PLLC
1629 K Street NW Suite 300
Washington, DC 20006-1631



**Courtesy Reminder for
Application Serial No: 17/322,832**

Attorney Docket No: PPA0010USC1

Customer Number: 167455

Date of Electronic Notification: 01/17/2023

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:
patent@capitoliplaw.com

To view your correspondence online or update your email addresses, please visit us anytime at <https://ppair-my.uspto.gov/pair/PrivatePair>.
If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number:

158747

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number:

158747

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone			Email

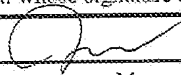
Assignee Name and Address:

PANTECH CORPORATION
10F, 251, Gangnam-daero, Seocho-gu, Seoul 05735, Rep. of Korea

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	Jan 27, 2023
Name	Yang-Won Jung	Telephone	+82-10-2250-9592
Title	Executive Vice President		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: PANTECH CORPORATIONApplication No./Patent No.: 17/322,832Filed/Issue Date: May 17, 2021Titled: APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEMPANTECH CORPORATION, a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: KWON, KIBUM et al. To: PANTECH CO., LTD.The document was recorded in the United States Patent and Trademark Office at
Reel 028776, Frame 0338, or for which a copy thereof is attached.2. From: PANTECH CO., LTD. To: PANTECH INC.The document was recorded in the United States Patent and Trademark Office at
Reel 039428, Frame 0268, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2. IPR2023-01269

Pantech Wireless, LLC Ex. 2023

Page 242 of 261

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)3. From: PANTECH INC. To: GOLDPEAK INNOVATIONS INCThe document was recorded in the United States Patent and Trademark Office at
Reel 042098, Frame 0451, or for which a copy thereof is attached.4. From: GOLDPEAK INNOVATIONS INC To: PANTECH CORPORATIONThe document was recorded in the United States Patent and Trademark Office at
Reel 052657, Frame 0066, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.☐ Additional documents in the chain of title are listed on a supplemental sheet(s).☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Young Seok Koo 76,255/February 2, 2023

Signature

Date

Young Seok KOO76,255

Printed or Typed Name

Title or Registration Number

[Page 2 of 2]

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	47474384
Application Number:	17322832
International Application Number:	
Confirmation Number:	4900
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	167455
Filer:	Young Seok Koo/Azatuhi Chinaryan
Filer Authorized By:	Young Seok Koo
Attorney Docket Number:	PPA0010USC1
Receipt Date:	03-FEB-2023
Filing Date:	17-MAY-2021
Time Stamp:	01:32:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	PANTECH_POA_executed.pdf	1170483	no	2
			974770a231121fa88ae6215e33dfb23623cd76		

Warnings:

IPR2023-01269

Pantech Wireless, LLC Ex. 2023

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Information:					
2	Assignee showing of ownership per 37 CFR 3.73	970060_Statement373c.pdf	90681	no	3
			4b51f1efcd163d24c35ade9e9e24b332d9f37c		
Warnings:					
Information:					
Total Files Size (in bytes):				1261164	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1

CONFIRMATION NO. 4900

POWER OF ATTORNEY NOTICE



OC000000137347097

Date Mailed: 02/08/2023

167455
Capitol IP Law Group, PLLC
1629 K Street NW Suite 300
Washington, DC 20006-1631

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/03/2023.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/mtklemichael/



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1

CONFIRMATION NO. 4900

POA ACCEPTANCE LETTER



OC000000137347108

158747
LADAS & PARRY
E-MAIL
4525 WILSHIRE BOULEVARD
SUITE 240
LOS ANGELES, CA 90010

Date Mailed: 02/08/2023

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/03/2023.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/mtklemichael/

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CHANGE OF CORRESPONDENCE ADDRESS *Application*

Address to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	17/322,832
Filing Date	05-17-2021
First Named Inventor	Kibum KWON
Art Unit	2464
Examiner Name	Truong, Lan-Huong
Attorney Docket Number	B-11526 970060-7

Please change the Correspondence Address for the above-identified patent application to:

The address associated with
Customer Number:

158747

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:



Applicant

Attorney or agent of record. Registration Number 76255.

Registered practitioner named in the application transmittal papers who acts in a representative capacity under 37 CFR 1.34. See 37 CFR 1.33(a)(1). Registration Number _____.

Signature /Young Seok Koo 76,255/

Typed or Printed
Name Young Seok Koo

Date April 17, 2023

Telephone 323-934-2300

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.
Submit multiple forms if more than one signature is required, see below*.

☐ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

"FEE ADDRESS" INDICATION FORM**Address to:**

**Mail Stop Maintenance Fee
Director of the United States
Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450**

-OR-**Fax to:****571-273-6500**

INSTRUCTIONS: The issue fee must have been paid for the application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application.

When to check the first box below: If you have a Customer Number to represent the fee address.

When to check the second box below: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

Customer Number: **158747****OR**

The attached Request for Customer Number form (PTO/SB/125)

PATENT NUMBER
(if known)

APPLICATION NUMBER

17/322,832

Completed by (check one):



Applicant/Inventor

/Young Seok Koo 76,255/

Signature

Attorney or Agent of record **76,255****Young Seok Koo**

Typed or printed name



Assignee of record of the entire interest. See
37 CFR 3.71. Statement under 37 CFR 3.73(c)
(Form PTO/AIA/96) is enclosed or was filed on

323-934-2300

Requester's telephone number

(Date)

April 17, 2023

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. If the assignee is a juristic entity, this form must be signed by a patent practitioner (attorney or agent) of record. Submit multiple forms if more than one signature is required, see below*.

*Total of **1** forms are submitted

This collection of information is required by 37 CFR 1.363. The information is required to obtain or retain a benefit by the public, which is to indicate (and for the USPTO to process) a fee address. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND COMPLETED FORMS TO THE PREVIOUS ADDRESS. **SEND COMPLETED FORMS TO: Mail Stop Maintenance Fee, Director of the United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	17322832			
Filing Date:	17-May-2021			
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM			
First Named Inventor/Applicant Name:	Kibum KWON			
Filer:	Young Seok Koo/Lianne Herbert			
Attorney Docket Number:	B-11526 970060-7			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

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Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1200

Electronic Acknowledgement Receipt

EFS ID:	47853164
Application Number:	17322832
International Application Number:	
Confirmation Number:	4900
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	158747
Filer:	Young Seok Koo/Lianne Herbert
Filer Authorized By:	Young Seok Koo
Attorney Docket Number:	B-11526 970060-7
Receipt Date:	17-APR-2023
Filing Date:	17-MAY-2021
Time Stamp:	14:55:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1200
RAM confirmation Number	E20234GE56407619
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Pantech Wireless, LLC Ex. 2023

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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	2023-04-17-970060-IssueFee-Transmittal.pdf	125737	no	1
			449a85f98cef88bef888b3afd776628e69b2eb38		
Warnings:					
Information:					
2	Change of Address	2023-04-17-970060-Change-of-CorrespondenceAddress-Form.pdf	264878	no	2
			e2703efa61dc2090669f95e046cbe8756d38e39e		
Warnings:					
Information:					
3	Maintenance Fee Address Change	2023-04-17-970060-FeeAddress-IndicationForm.pdf	264027	no	2
			d5305709a0110962e25c5560d82be276441352fb		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	38174	no	2
			8d7197b3e7282c407b3c2950c10fa412c9f08792		
Warnings:					
Information:					
Total Files Size (in bytes):			692816		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

167455 7590 01/17/2023
Capitol IP Law Group, PLLC
1629 K Street NW Suite 300
Washington, DC 20006-1631

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

	(Typed or printed name)
	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/322,832	05/17/2021	Kibum KWON	PPA0010USC1	4900

TITLE OF INVENTION: APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	04/17/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
TRUONG, LAN-HUONG	2464	370-350000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☒ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☒ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Ladas & Parry, LLP

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

PANTECH CORPORATION

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

SEOUL, REPUBLIC OF KOREA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 12-0415

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29☐ Applicant asserting small entity status. See 37 CFR 1.27☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Young Seok Koo 76,255/

Date April 17, 2023

Typed or printed name Young Seok Koo

Registration No. 76,255



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/322,832	05/23/2023	11659503	B-11526 970060-7	4900

158747 7590 05/03/2023
LADAS & PARRY
E-MAIL
4525 WILSHIRE BOULEVARD
SUITE 240
LOS ANGELES, CA 90010

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at <https://patentcenter.uspto.gov/>. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at <https://certifiedcopycenter.uspto.gov/index.html>. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 67 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Kibum KWON, Seoul, KOREA, REPUBLIC OF;
Myungcheul JUNG, Seoul, KOREA, REPUBLIC OF;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

PANTECH CORPORATION, Seoul, KOREA, REPUBLIC OF;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address : COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, VA 22313-1450

www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.
17/322,832	23-MAY-23	11659503

LADAS & PARRY E-MAIL
4525 WILSHIRE BOULEVARD SUITE 240
LOS ANGELES, CA 90010

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at <https://patentcenter.uspto.gov>

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit <https://www.uspto.gov/electronicgrants>