PTO/AIA/15 (03-13)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	GP.009C2
First Named Inventor	Kibum Kwon
Title	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✔] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [ ] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✔] **Specification** [*Total Pages* 51] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✔] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 11]
6. **Inventor's Oath or Declaration** [*Total Pages* 4] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [ ] Newly executed (original or copy)
   b. [✔] A copy from a prior application (37 CFR 1.63(d))
7. [✔] **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ADDRESS TO:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. [✔] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [✔] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [✔] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [ ] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [ ] **Other:** _____

***Note**: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✔] The address associated with Customer Number: 146410 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Seong Jun PARK/	Date	2020-01-02
Name (Print/Type)	Seong Jun PARK	Registration No. (Attorney/Agent)	73,534

This collection of information is required by 37 CFR 1.53(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.

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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	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. Add

Correspondence Information:

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	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	146410		
Email Address	edward.park@fidelis-laws.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	GP.009C2	**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	146410		

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	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			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15820980	2017-11-22
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15820980	Continuation of	14733068	2015-06-08
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
14733068	Continuation of	13578531	2012-08-10
Prior Application Status			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. Add

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).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10-2011-0008683	KR	2011-01-28	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM	

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10-2010-0027230	KR	2010-03-26	

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	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. Add

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	GP.009C2
	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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	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 — Remove

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	GOLDPEAK INNOVATIONS INC		
Mailing Address Information For Applicant:			
Address 1	SUITE #806, DIGITAL-RO 34-GIL, 55, GURO-GU		
Address 2			
City	Seoul	**State/Province**	
Country	KR	Postal Code	08378
Phone Number		Fax Number	
Email Address			

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

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.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	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.

Remove

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. Add

Signature:

Remove

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	/Seong Jun PARK/			Date (YYYY-MM-DD)	2020-01-02
First Name	Seong Jun	Last Name	PARK	Registration Number	73,534

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	GP.009C2
	Application Number	
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM	

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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 CooperationTreaty.

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.

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.

IPR2023-01269
Pantech Wireless, LLC Ex. 2021
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CLAIMS

1. A communication method comprising:

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

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

transmitting, at the UE, the random access preamble through the secondary CC; and

receiving, at the UE, a random access response through the primary CC.

2. A communication apparatus 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 timing group, the RRC message comprises information related to a second timing group, the second 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 through the secondary CC; and

cause the apparatus to receive a random access response through the primary CC.

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

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 13/578,531, filed on August 10, 2012, which is the 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.

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 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

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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.

[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

[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.

[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.

[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

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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.

[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 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) 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.

[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

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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

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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

[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 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;

[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;

[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

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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

[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 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.

[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 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

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(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

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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.

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[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.

[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 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 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 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,

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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

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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.

[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.

[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 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.

[0056] [Equation 1]

$$TA = \left(N_{TA} + N_{TA\,offset}\right) \cdot T_s \quad \text{seconds}$$

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[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 thatUE 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

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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.

[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 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 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. 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

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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 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 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.

[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

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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

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the following methods.

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

[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

[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 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 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.

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[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 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.

[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 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 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

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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

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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.

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[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.

[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 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 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

[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

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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

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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

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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 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 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 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 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.

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[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

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[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.

[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

[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

[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.

[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

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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

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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 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 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.

[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 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

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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.

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[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.

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[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,

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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

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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

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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 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. 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 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).

[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

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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

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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 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 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 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 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

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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). 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).

[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.

[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

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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.

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[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).

[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 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 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 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

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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.

[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.

[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 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).

[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

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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.

[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).

[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.

[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 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

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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.

[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 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 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 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

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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.

[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 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 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 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

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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 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 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 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 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

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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.

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[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

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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

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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

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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

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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

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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

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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.

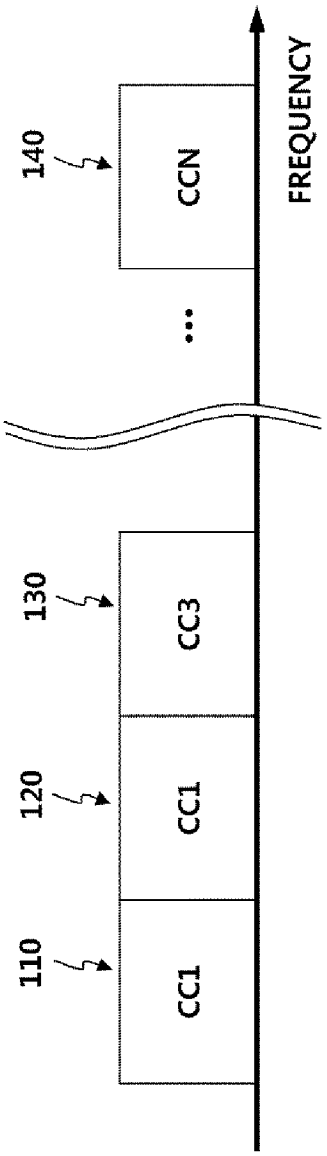
[0266] Subsequently, the transceiving unit 1105 may receive UL timing group information from the eNB, and simultaneously receive UL synchronization information through a few or all of DL CCs associated with the received UL timing group, and the controller 1110 may set a UL CC associated with a CC through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

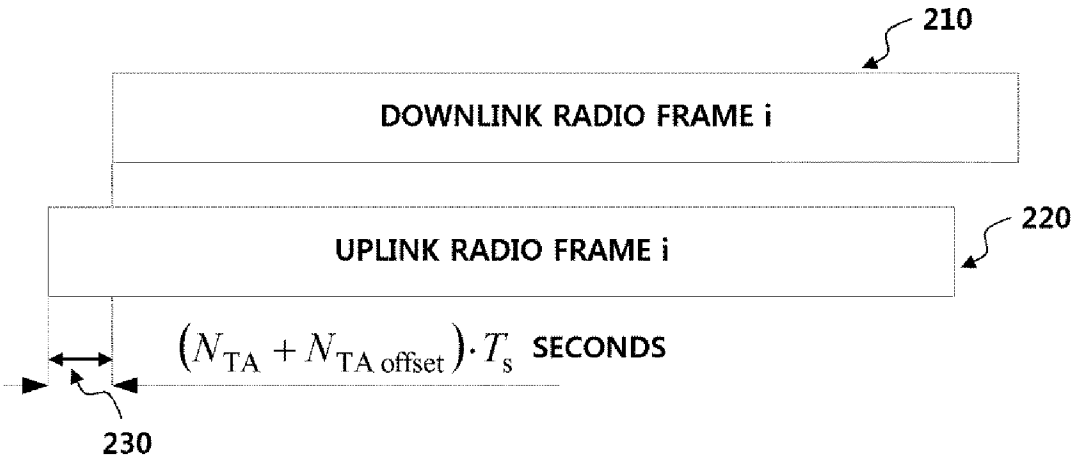
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FIG. 1



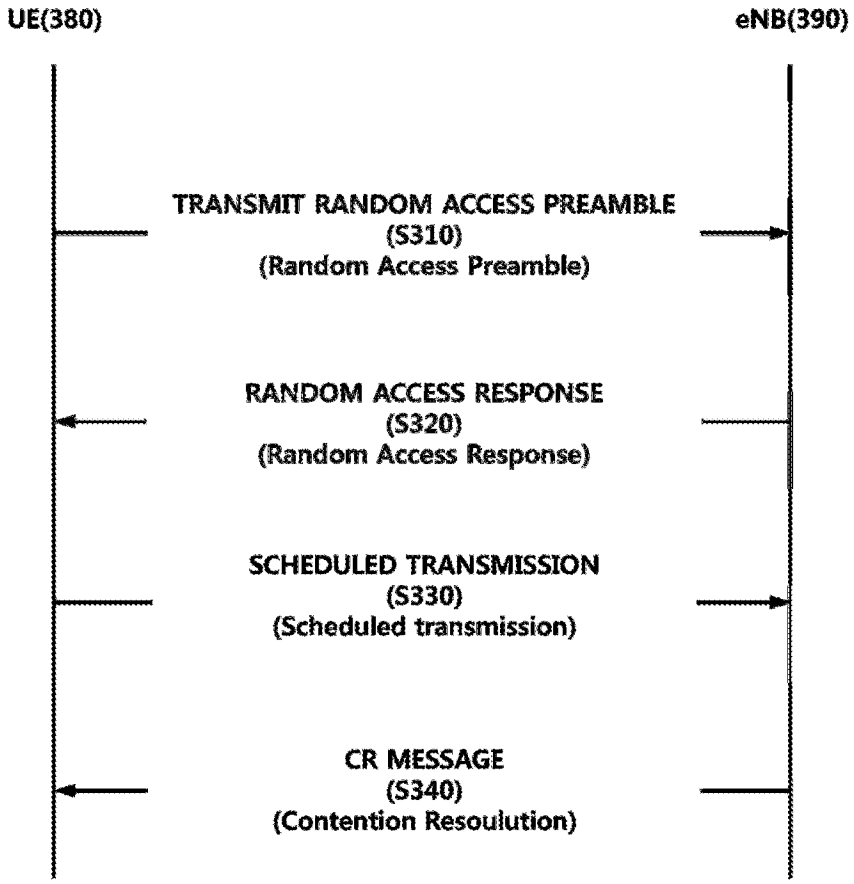
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FIG.2



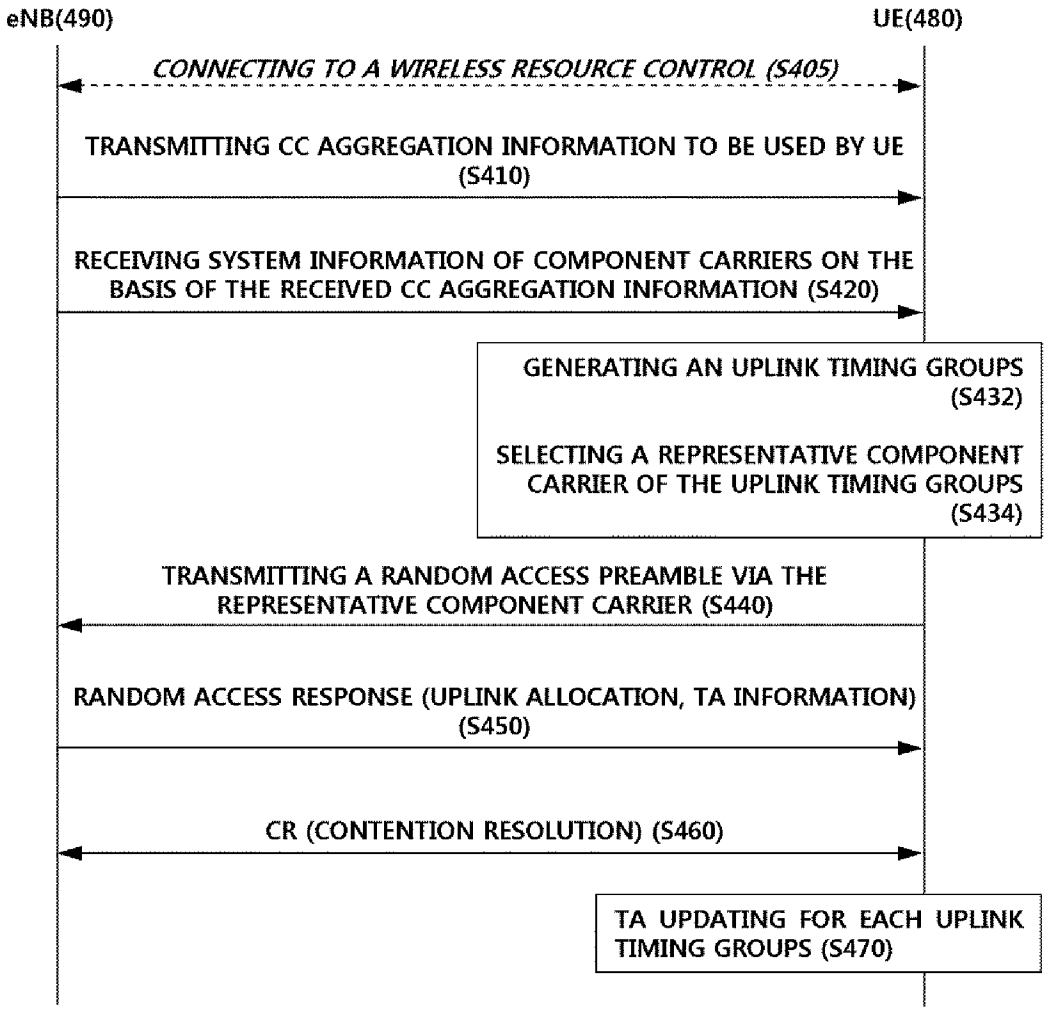
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FIG.3



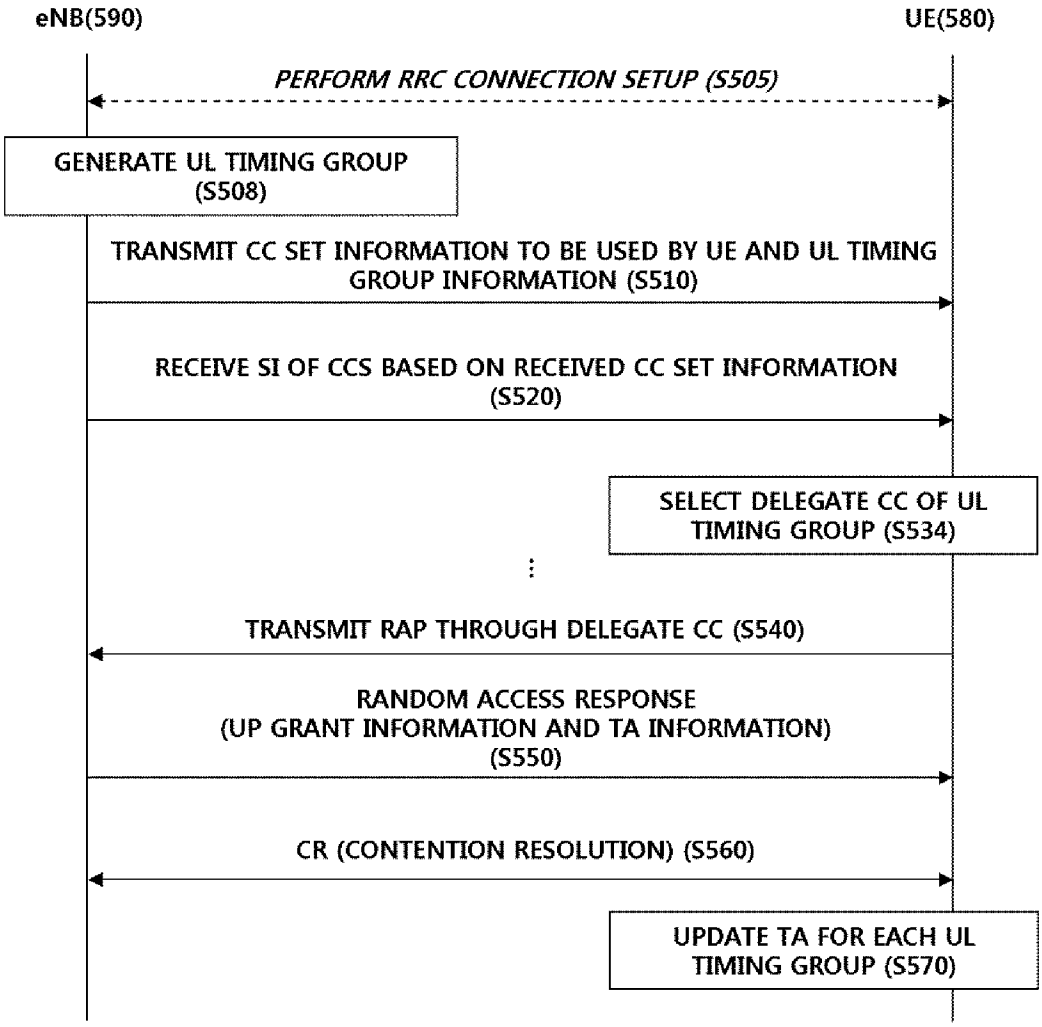
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FIG. 4



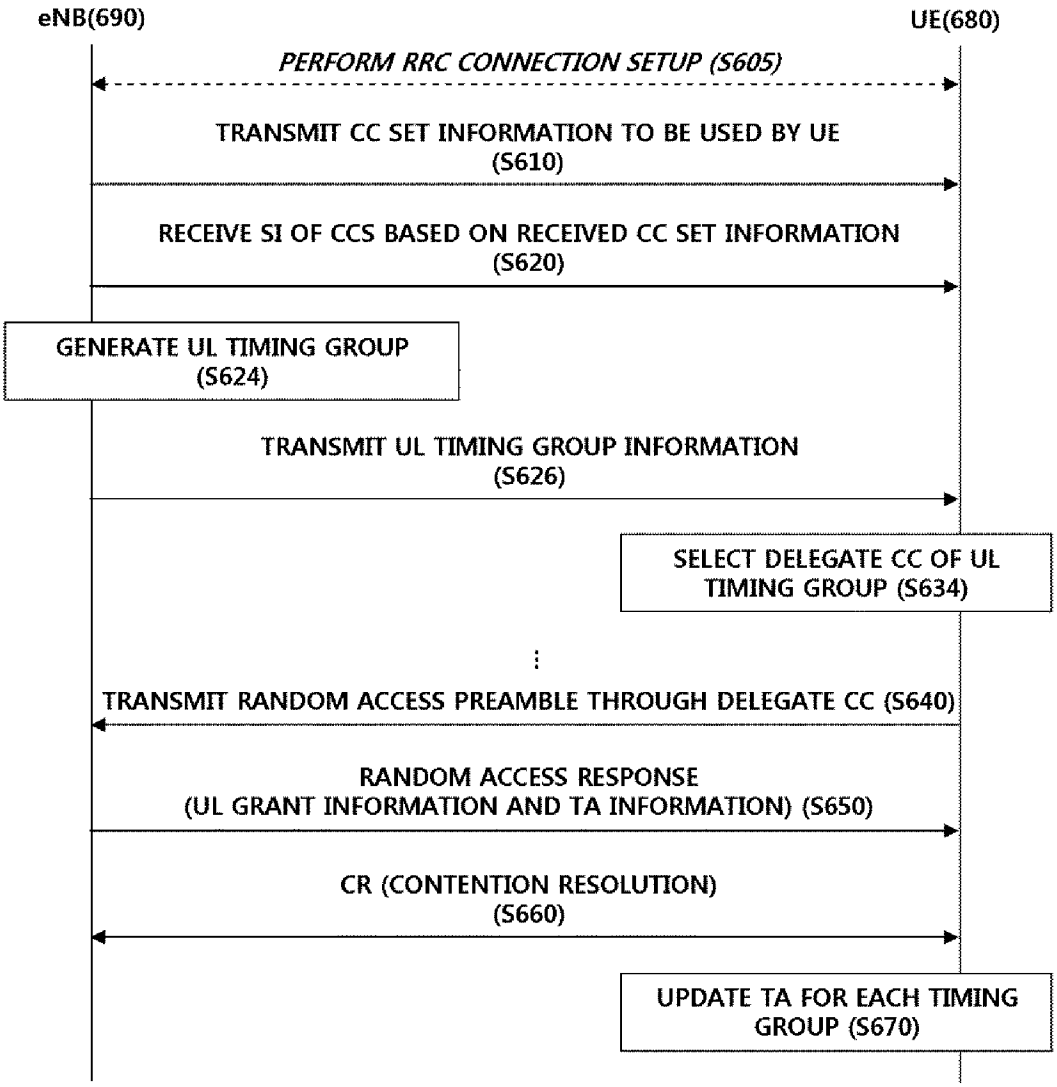
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FIG.5



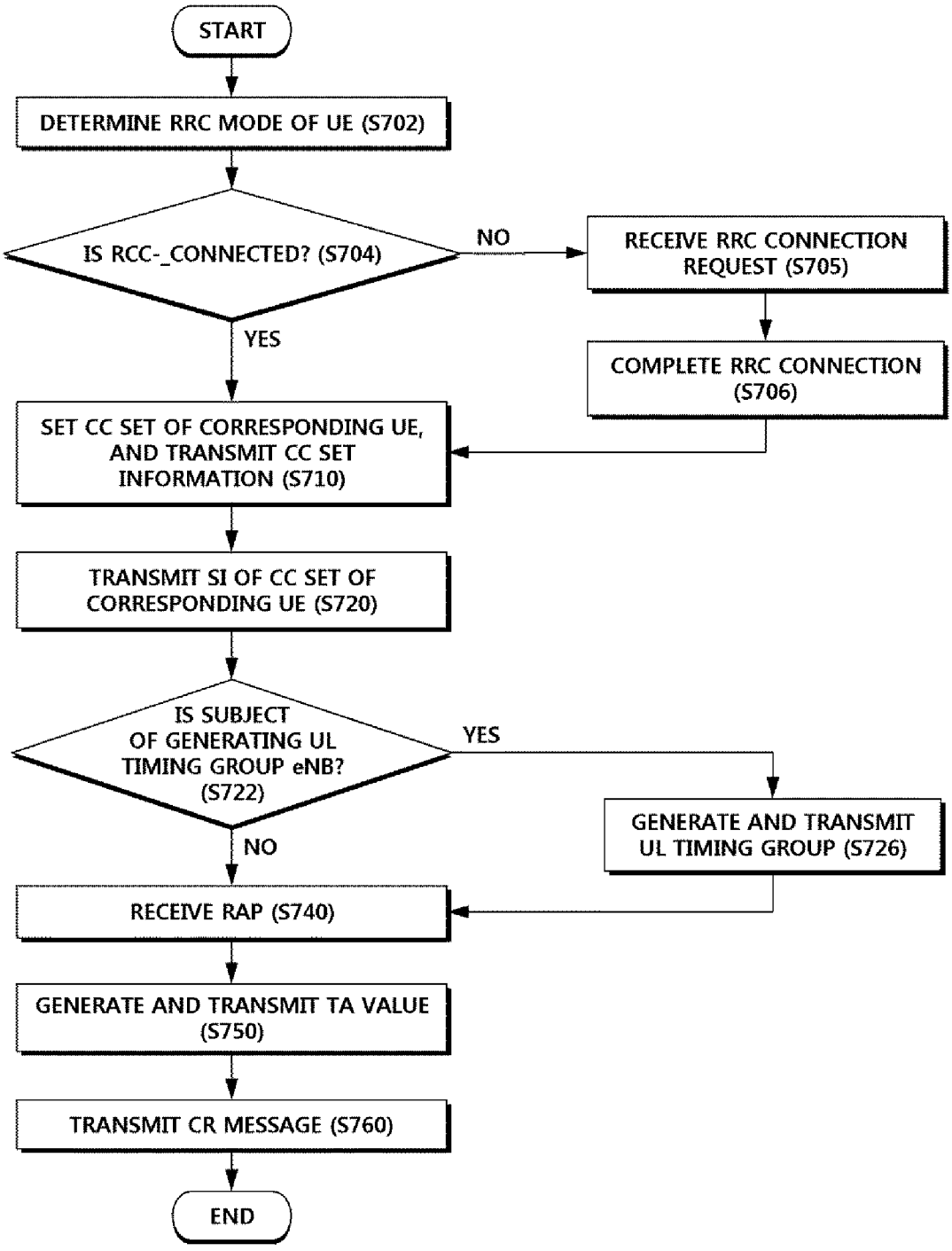
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FIG.6



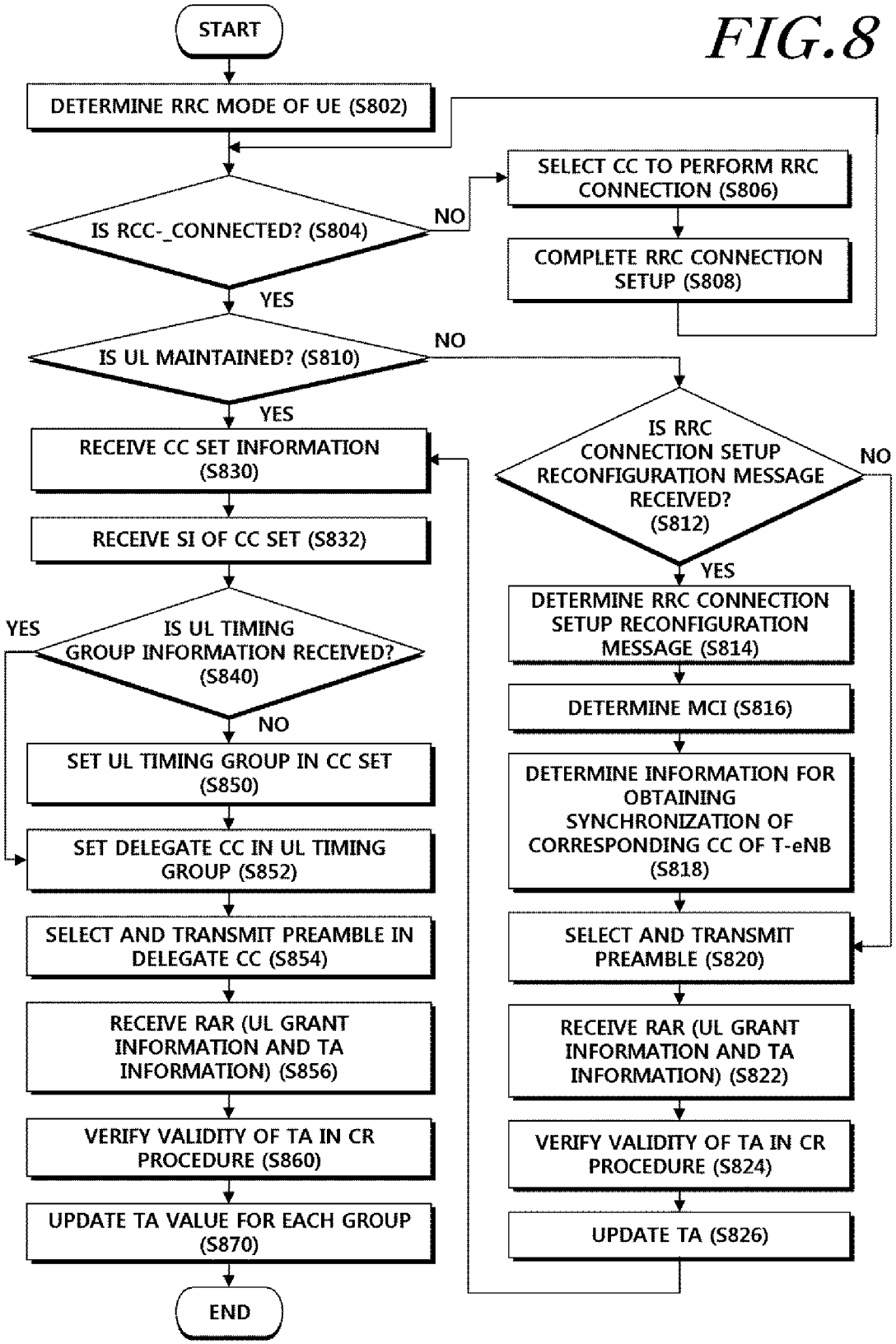
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FIG. 7



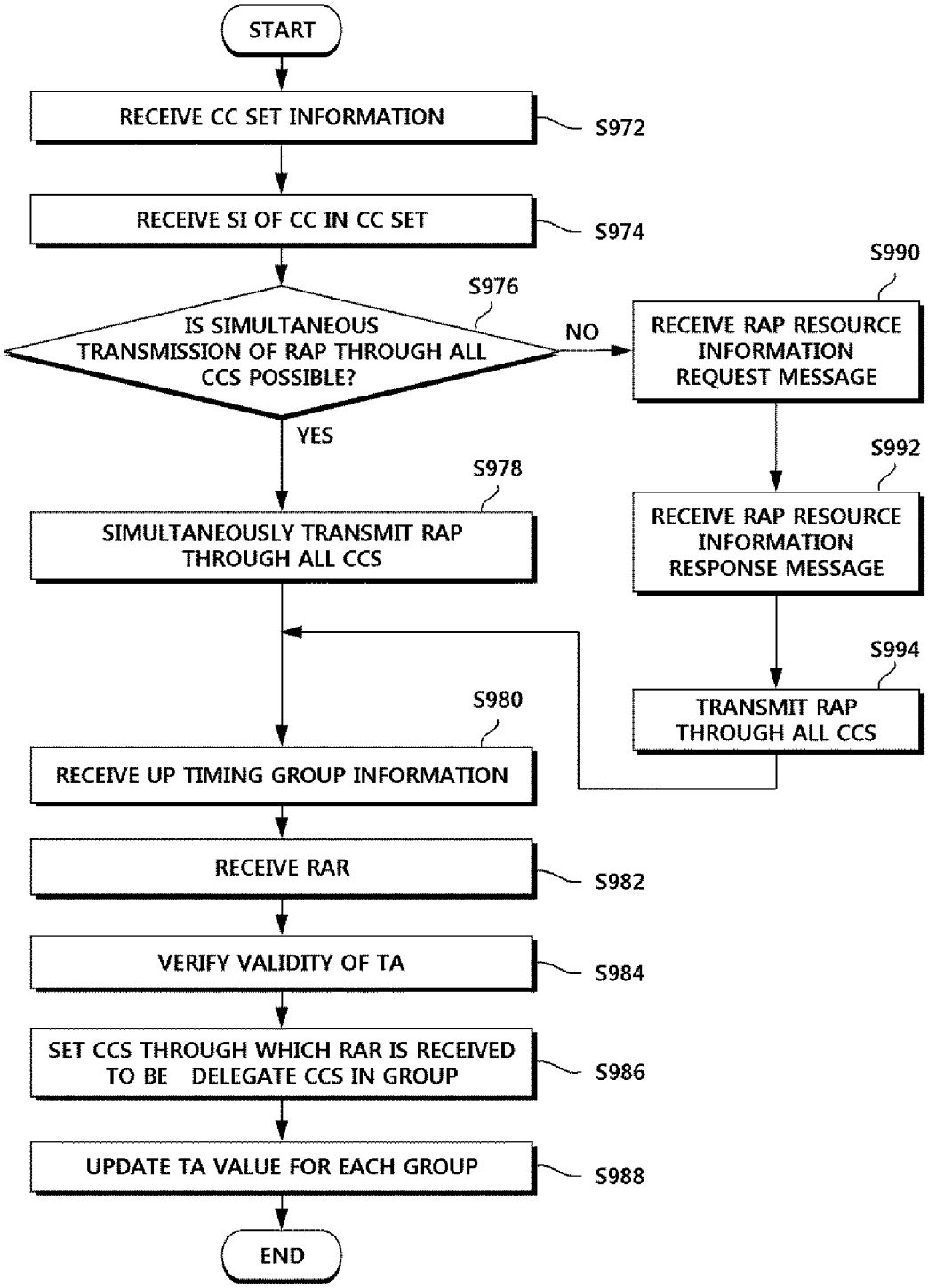
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FIG.8



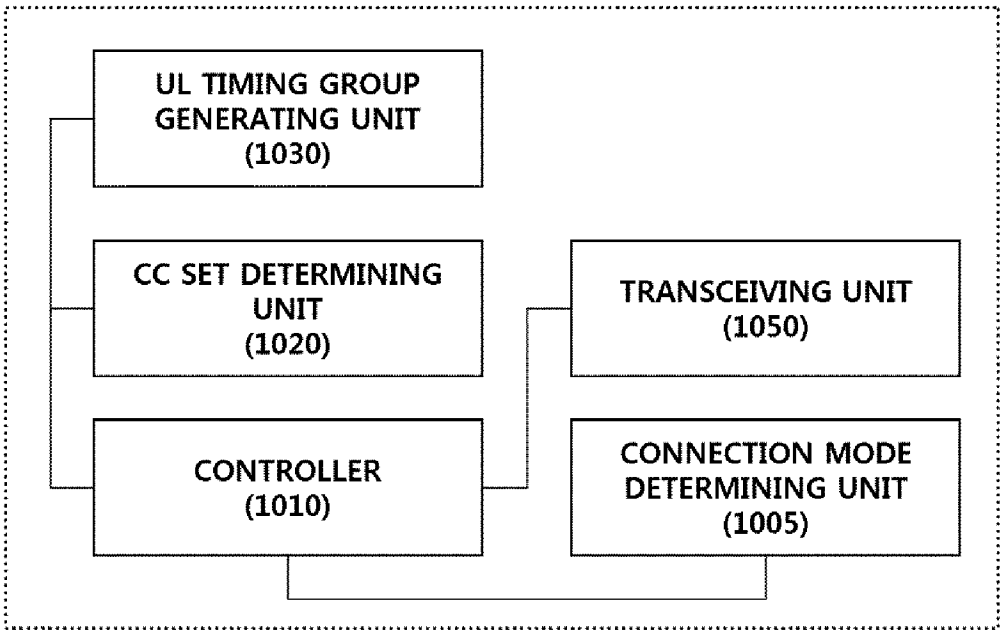
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FIG.9



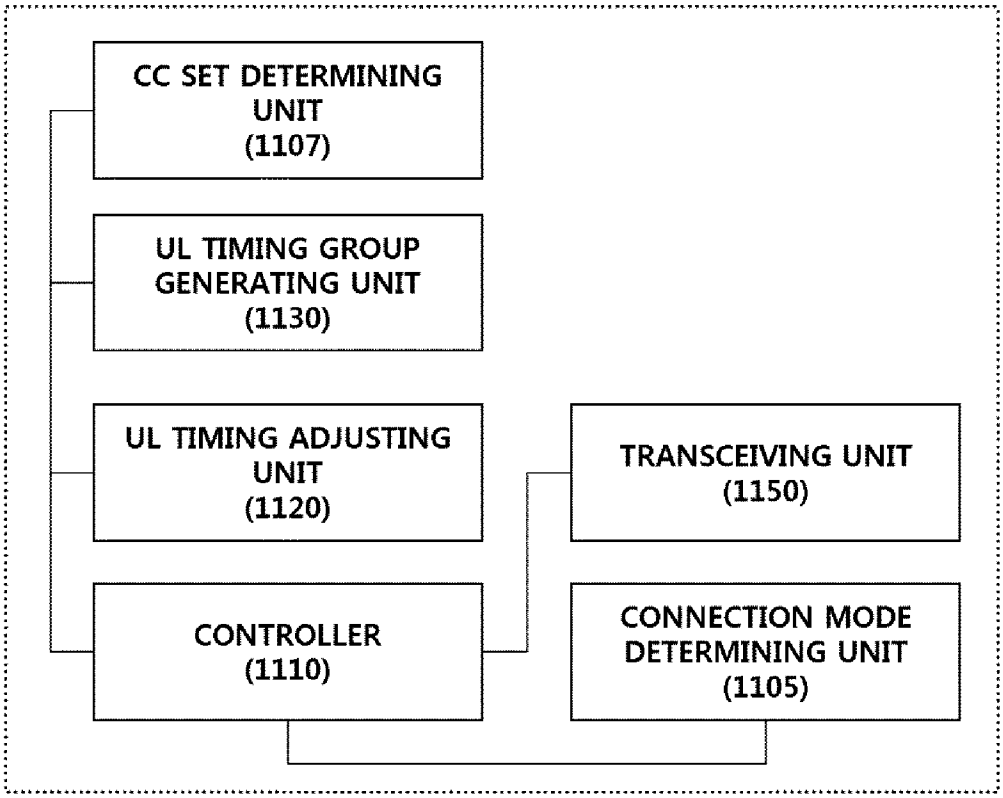
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FIG.10



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FIG.11



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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: 146410

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 assignments 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: 146410

OR

☐

Firm or Individual Name	Fidelis Law Group, PLLC		
Address	444 W Broad St unit 426		
City	Falls Church	State VA	Zip 22046
Country	USA		
Telephone	571.730.4572	Email	edward.park@fidelis-laws.com

Assignee Name and Address: GOLDPEAK INNOVATIONS INC
SUITE #806, DIGITAL-RO 34-GIL, 55, GURO-GU
SEOUL, 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	27 / Mar / 2017
Name	Youngjoon Rhee	Telephone	+82.10.8929.1905
Title	CEO		

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.
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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.
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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.

PTO/AIA/01 (06-12)
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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:

- [x] 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.

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: Myung Cheul JUNG Date (Optional) 2015-06-09

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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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:

- [x] 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: _____

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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PTO/AIA/96 (08-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: GOLDPEAK INNOVATIONS INC

Application No./Patent No.: n/a Filed/Issue Date: 2020-01-02

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

GOLDPEAK INNOVATIONS INC, 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 042098, Frame 0653, 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: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. 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.

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.

STATEMENT UNDER 37 CFR 3.73(c)

3. 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.

4. 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.

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.

/Seong Jun PARK/	2020-01-02
Signature	Date
Seong Jun PARK	73,534
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number	Continuation of U.S. Application No. 15/820,980	Confirmation No.:	TBD
Applicant	GOLDPEAK INNOVATIONS INC		
Filed	Herewith		
Title	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		
TC/Art Unit	TBD		
Examiner	TBD		
Docket No.	GP.009C2		
Customer No.	146410		

INFORMATION DISCLOSURE STATEMENT

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Applicant wishes to make of record the references listed on the PTO/SB/08 and PTO-892 forms from parent application No. 15/820,980 filed on November 22, 2017 for consideration and request the references cited therein be made of record by the U.S. Patent and Trademark Office ("USPTO") in the above-captioned application. The listed documents were previously cited in the parent applications, upon which Applicant relies for the benefits provided under 35 U.S.C. § 120. Accordingly, pursuant to 37 C.F.R. § 1.98(d), a copy of each reference is not provided. Applicant will, however, provide copies of the references for the Examiner's convenience upon request.

Applicant respectfully notes that the submission of the listed references in this Information Disclosure Statement ("IDS") is not an admission that they are prior art or that they are material to patentability of any claims of the application. Also, the submission of this IDS is not an indication that a search has been made by Applicant.

Consideration of the foregoing plus the prompt return of a copy of the enclosed Form PTO/SB/08B with the Examiner's initials in the left column in accordance with MPEP 609 are respectfully requested.

Respectfully submitted,

FIDELIS LAW GROUP, PLLC

Dated: January 2, 2020

By: /Seong Jun PARK/

Seong Jun PARK
Registration No 73,534

FIDELIS LAW GROUP, PLLC
8300 Greensboro Dr STE L1-101
McLean, VA 22102
Phone (571) 310-2302

IPR2023-01269
Pantech Wireless, LLC Ex. 2021
Page 86 of 345

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number	:	Continuation of U.S. Application No. 15/820,980	Confirmation No.:	TBD
Inventor	:	Kibum Kwon *et al.*		
Filed	:	Herewith		
Title	:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM		
TC/Art Unit	:	TBD		
Examiner	:	TBD		
Docket No.	:	GP.009C1		
Customer No.	:	146410		

PRELIMINARY AMENDMENT FILED WITH CONTINUATION APPLICATION OF U.S. PATENT APPLICATION NO. 15/820,980

Mail Stop New Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to examination on the merits, please amend the above-identified patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Remarks begin on page 3 of this paper.

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Pantech Wireless, LLC Ex. 2021
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AMENDMENTS TO THE SPECIFICATION

Please AMEND the paragraph [0001] on Page 1 as below:

[0001] This application 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, which is a continuation of U.S. Patent Application No. 13/578,531, filed on August 10, 2012, which is the 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.

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REMARKS

The application is a continuation of U.S. Patent Application No. 15/820,980.

CONCLUSION

In view of the foregoing amendments and arguments, it is respectfully submitted that this application is now in condition for allowance. If the Examiner believes that prosecution and allowance of the application will be expedited through an interview, whether personal or telephonic, the Examiner is invited to telephone the undersigned with any suggestions leading to the favorable disposition of the application.

It is believed that all necessary fees are being paid with this Preliminary Amendment. However, the Director is hereby authorized to treat any current or future reply, requiring a petition for an extension of time for its timely submission as incorporating a petition for extension of time for the appropriate length of time.

Respectfully submitted,

FIDELIS LAW GROUP, PLLC

By: /Seong Jun PARK/
Seong Jun PARK
Registration No 73,534

Dated: January 2, 2020

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Pantech Wireless, LLC Ex. 2021
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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:	Seong Jun Park
Attorney Docket Number:	GP.009C2

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	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1720**

Electronic Acknowledgement Receipt

EFS ID:	38190205
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	146410
Filer:	Seong Jun Park
Filer Authorized By:	
Attorney Docket Number:	GP.009C2
Receipt Date:	02-JAN-2020
Filing Date:	
Time Stamp:	18:29:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1720
RAM confirmation Number	E202012I29556967
Deposit Account	601655
Authorized User	Seong Jun Park

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

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	00UtilityAppTransmittalForm.pdf	276701 72c7d63643c09cafe8f83133b9cb51a4a608f848	no	2
Warnings:					
Information:					
2	Application Data Sheet	01ADS.pdf	1823587 7979043d88dfd3c1cda4d10d23f40680ac9bef21	no	9
Warnings:					
Information:					
3	Abstract	02abs.pdf	12325 65afd7deb06be05b191c9a54202a04492db00ac5	no	1
Warnings:					
Information:					
4	Claims	02claims1p.pdf	10978 cb35b04e6578fe72e4f844695d10c89f00bcf82a	no	1
Warnings:					
Information:					
5	Specification	02spec51p.pdf	2124783 3e4834ab2f6b64f7cd92006197f4d37587d96e21	no	51
Warnings:					
Information:					
6	Drawings-only black and white line drawings	03drawings11p.pdf	233544 0636e368eabb4db33f0a02c23e46f093d0f2b704	no	11
Warnings:					
Information:					

7	Power of Attorney	04POA.pdf	1045958 a87949d5c25ca9a30afe1aff1de0bb07b1b67cde	no	2
Warnings:					
Information:					
8	Oath or Declaration filed	05dec4p.pdf	594588 f7d8e1544d5e7e85108b2bdc91028f91102e00d6	no	4
Warnings:					
Information:					
9	Assignee showing of ownership per 37 CFR 3.73	06statement.pdf	123388 81db42c216b5378388fb20d87f3cd8503458eb5e	no	3
Warnings:					
Information:					
10	Transmittal Letter	07IDStrans.pdf	19872 b167298f16fb052a6a684ea8e025bf8b9baabe38	no	2
Warnings:					
Information:					
11		08PreAmd.pdf	33502 f263acad96801db7936d0643923f5d00356 26f24	yes	3

Multipart Description/PDF files in .zip description

Document Description	Start	End
Preliminary Amendment	1	1
Specification	2	2
Applicant Arguments/Remarks Made in an Amendment	3	3

Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	35099 118b7a84436f3155b384e8ed50cc2de4533ed637	no	2
Warnings:					

Information:	
Total Files Size (in bytes):	6334325

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.

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C46575

Sale Accounting Date:01/24/2020

Sale Item Reference Number	Effective Date
16733106	01/02/2020

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20201N019139446	1051	LATE FILING FEE FOR OATH OR DECLARATION	$160.00	Deposit Account

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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/733,106	01/02/2020		1880	GP.009C2	2	2

CONFIRMATION NO. 6857

146410
Fidelis Law Group , PLLC
8300 Greensboro Dr Ste L1-101
McLean, VA 22102

FILING RECEIPT

OC000000114195112

Date Mailed: 01/27/2020

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)

GOLDPEAK INNOVATIONS INC, Seoul, KOREA, REPUBLIC OF;

Power of Attorney: The patent practitioners associated with Customer Number 146410

Domestic Priority data as claimed by applicant

This application is a CON of 15/820,980 11/22/2017
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: 01/23/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/733,106**

Projected Publication Date: 05/07/2020

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

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).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/733,106

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	2 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 460 =	0.00
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	1720

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	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.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/733,106	01/02/2020	Kibum KWON	GP.009C2

CONFIRMATION NO. 6857

146410
Fidelis Law Group , PLLC
8300 Greensboro Dr Ste L1-101
McLean, VA 22102

INFORMAL NOTICE

OC000000114195113

Date Mailed: 01/27/2020

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s) *as named on the application data sheet:*
  Myungcheul JUNG
  An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor must be submitted no later than the date on which the issue fee is paid in response to a notice requiring such fee. See 37 CFR 1.53(f).
  If the name of the inventor provided on the ADS is not correct, applicant must submit a request to correct the inventor name according to 37 CFR 1.48(f), accompanied by the appropriate fee under 37 CFR 1.17(i) and a corrected ADS in compliance with 37 CFR 1.76(c), i.e., identifying the information that is being changed with underlining for insertions, and strike-through or brackets for text removed.

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**.

/tnguyen/

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Pantech Wireless, LLC Ex. 2021
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PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16733106
Filing Date	2020-04-27
First Named Inventor	Ki Bum KWON
Art Unit	2462
Examiner Name	MESFIN, YEMANE
Attorney Docket Number	GP.009C2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8606336		2013-12-10	Womack, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090274120		2009-11-05	Chou	
	2	20100111005		2010-05-06	Ahn, et al.	
	3	20100041399		2010-02-18	kim, et al.	
	4	20100238857		2010-09-23	Zhang,et al.	
	5	20100323744		2010-12-23	Kim, et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16733106
	Filing Date	2020-04-27
	First Named Inventor	Ki Bum KWON
	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
	Attorney Docket Number	GP.009C2

	6	20100118720		2010-05-13	Gauvreau, et al.	
	7	20110170495		2011-07-14	Earnshaw, et al.	
	8	20090316642		2009-12-24	Yamada, et al.	
	9	20090318175		2009-12-24	Sandberg	
	10	20100086065		2010-04-08	Higuchi, et al.	
	11	20090270094		2009-10-29	Ito, et al.	
	12	20090116434		2009-05-07	Lohr, et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	10-2009-0115913	KR		2009-11-10	Industrial Technology Research Institute		
	2	10-2008-0063023	KR		2008-07-03	Posdata Co., Ltd.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16733106
	Filing Date	2020-04-27
	First Named Inventor	Ki Bum KWON
	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
	Attorney Docket Number	GP.009C2

	3	10-2008-0079961	KR		2008-09-02	LG Electronics Inc.		
	4	2009/113815	WO		2009-09-17	LG ELECTRONICS INC.		
	5	2013-516917	JP		2013-05-13	INTER DIGITAL PATENT HOLDINGS, INC.		
	6	2010-254386	JP		2010-11-11	MITSUBISHI ELECTRIC BUILDING TECHNO SERVICE CO LTD		

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	International Search Report of PCT/KR2011/000909 dated December 7, 2011.	
	2	Non Final Office Action issued on July 16, 2014, in U.S. Application No. 13/578,531.	
	3	Notice of Allowance issued on February 4, 2015, in U.S. Application No. 13/578,531.	
	4	Qualcomm Incorporated, "Supporting multiple timing advance groups", 3GPP TSG-RAN WG2 meeting#68bis, January 18-22, 2010, R2-100423, Valencia, Spain.	
	5	ITRI, "Time Alignment Timer for different TA", 3GPP TSG-RAN WG2 meeting#68bis, January 18-22, 2010, R2-100560, Valencia, Spain.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16733106
	Filing Date	2020-04-27
	First Named Inventor	Ki Bum KWON
	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
	Attorney Docket Number	GP.009C2

	6	NTT DOCOMO, INC., "TA maintenance for CA", 3GPP TSG-RAN2#68bis, January 18-22, 2010, R2-100472, Valencia, Spain.
	7	Huawei, "Different Timing Advance Impact on Carrier Aggregation", 3GPP TSG RAN WG2 meeting#67bis, October 12-16, 2009, R2-095815, Miyazaki, Japan.
	8	CATT, "L3 Anchor Carrier", 3GPP TSG-RAN WG2 Meeting #67, R2-094322, August 24-28, 2009, 2 pages, Shenzhen, China.
	9	Nokia Corporation, Nokia Siemens Networks, "RACH and carrier aggregation", 3GPP TSG-RAN WG2 Meeting #67bis, 2009.10.12-16, 3 pages, Miyazaki, Japan.
	10	Office Action issued by JPO on June 13, 2017 for the corresponding JP Application No. 2015-154385
	11	Office Action issued by KIPO on 12/21/2016 for the corresponding KR Application No. 10-2011-0008683.
	12	Nokia Corporation et al, 3GPP TSG-RAN WG2 Meeting #67bis, R2-095898, "RACH and carrier aggregation", Miyazaki, Japan dated October 12th- 16th, 2009.
	13	Office Action issued by Chinese Patent Office on 11/04/2019 for the corresponding CN Application No. 201610908740.4

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16733106
	Filing Date	2020-04-27
	First Named Inventor	Ki Bum KWON
	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
	Attorney Docket Number	GP.009C2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Seong Jun PARK/	Date (YYYY-MM-DD)	2020-04-27
Name/Print	Seong Jun PARK	Registration Number	73,534

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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 record s.

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.

检 索 报 告

申请号：2016109087404	申请日：20110210	首次检索
申请人：金峰创新公司	最早的优先权日：20100210	
权利要求项数：9	说明书段数：272+11	
审查员确定的 IPC 分类号：H04L 5/00,H04W 56/00,H04B 1/7087,H04W 88/08,H04W 92/10		
检索记录信息：CNABS,CNTXT,VEN,CNKI,ISI,IEEE,ETSI,ITU-T,3GPP,IETF,GOOGLE WEB,GOOGLE SCHOLAR：WO2008112255A2,495 USTXT-EPTXT-WOTXT,(up+ or UL) and (carrier+ or CC) and (RRC AND RAP) and (LTE OR eNB OR NodeB).		

相 关 专 利 文 献

类型	国别以及代码[11] 给出的文献号	代码[43]或[45] 给出的日期	IPC 分类号	相关的段落 和 / 或图号	涉及的权 利要求
A	CN101589566A	20011125	H04B 7/26	全文	1-9
A	WO2008112255A2	20080918	H04Q 7/38	全文	1-9
A	US2008268850A1	20081030	H04Q 7/20	全文	1-9
A	CN101473562A	20090701	H04B 7/26	全文	1-9
A	CN101513099A	20090819	H04W 36/08	全文	1-9

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相 关 非 专 利 文 献					
类型	书名（包括版本号和卷号）	出版日期	作者姓名和出版者名称	相关页数	涉及的权利要求
类型	期刊或文摘名称 （包括卷号和期号）	发行日期	作者姓名和文章标题	相关页数	涉及的权利要求

表格填写说明事项：

1．审查员实际检索领域的 IPC 分类号应当填写到大组和 / 或小组所在的分类位置。

2．期刊或其它定期出版物的名称可以使用符合一般公认的国际惯例的缩写名称。

3．相关文件的类型说明：

X：一篇文件影响新颖性或创造性；

Y：与本报告中的另外的 Y 类文件组合而影响创造性；

A：背景技术文件；

R：任何单位或个人在申请日向专利局提交的、属于同样的发明创造的专利或专利申请文件。

P：中间文件，其公开日在申请的申请日与所要求的优先权日之间的文件；

E：抵触申请。

审 查 员：魏臻　　审查部门：专利审查协作广东中心通信发明审查部

2019 年 10 月 28 日

国 家 知 识 产 权 局

100033

北京市金融街 35 号国际企业大厦 A 座 16 层 北京三友知识产权代理有限公司

吕俊刚(010-88091921) 宋教花(010-88091921)

发文日：

2019 年 11 月 04 日

申请号或专利号：**201610908740.4**　　发文序号：**2019103001990350**

申请人或专利权人： 金峰创新公司

发明创造名称： 在无线通信系统中建立上行链路同步的设备和方法

第 一 次 审 查 意 见 通 知 书

1. ☒应申请人提出的实质审查请求，根据专利法第 35 条第 1 款的规定，国家知识产权局对上述发明专利申请进行实质审查。

☐根据专利法第 35 条第 2 款的规定，国家知识产权局决定自行对上述发明专利申请进行审查。

2. ☒申请人要求以其在：

KR 专利局的申请日 2010 年 02 月 10 日为优先权日，

KR 专利局的申请日 2010 年 03 月 26 日为优先权日，

KR 专利局的申请日 2011 年 01 月 28 日为优先权日。

☒申请人已经提交了经原受理机构证明的第一次提出的在先申请文件的副本。

☐申请人尚未提交经原受理机构证明的第一次提出的在先申请文件的副本，根据专利法第 30 条的规定视为未要求优先权要求。

3. ☐经审查，申请人于_____提交的修改文件，不符合专利法实施细则第 51 条第 1 款的规定，不予接受。

4. 审查针对的申请文件：

☐原始申请文件。☒分案申请递交日提交的文件。☐下列申请文件：

5. ☐本通知书是在未进行检索的情况下作出的。

☒本通知书是在进行了检索的情况下作出的。

☐本通知书引用下列对比文件(其编号在今后的审查过程中继续沿用)：

编号	文 件 号 或 名 称	公开日期（或抵触申请的申请日）

6. 审查的结论性意见：

关于说明书：

☐申请的内容属于专利法第 5 条规定的不授予专利权的范围。

☐说明书不符合专利法第 26 条第 3 款的规定。

☐说明书不符合专利法第 33 条的规定。

☐说明书的撰写不符合专利法实施细则第 17 条的规定。

☐_____

纸件申请，回函请寄：100088 北京市海淀区蓟门桥西土城路 6 号　国家知识产权局专利局受理处收

电子申请，应当通过电子专利申请系统以电子文件形式提交相关文件。除另有规定外，以纸件等其他形式提交的文件视为未提交。

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关于权利要求书：

☐权利要求_____不符合专利法第 2 条第 2 款的规定。
☐权利要求_____不符合专利法第 9 条第 1 款的规定。
☐权利要求_____不具备专利法第 22 条第 2 款规定的新颖性。
☐权利要求_____不具备专利法第 22 条第 3 款规定的创造性。
☐权利要求_____不具备专利法第 22 条第 4 款规定的实用性。
☐权利要求_____属于专利法第 25 条规定的不授予专利权的范围。
☒权利要求 2,5,8 不符合专利法第 26 条第 4 款的规定。
☐权利要求_____不符合专利法第 31 条第 1 款的规定。
☐权利要求_____不符合专利法第 33 条的规定。
☐权利要求_____不符合专利法实施细则第 19 条的规定。
☐权利要求_____不符合专利法实施细则第 20 条的规定。
☐权利要求_____不符合专利法实施细则第 21 条的规定。
☐权利要求_____不符合专利法实施细则第 22 条的规定。
☐_____

☐申请不符合专利法第 26 条第 5 款或者实施细则第 26 条的规定。
☐申请不符合专利法第 20 条第 1 款的规定。
☐分案申请不符合专利法实施细则第 43 条第 1 款的规定。

上述结论性意见的具体分析见本通知书的正文部分。

7. 基于上述结论性意见，审查员认为：

☐申请人应当按照通知书正文部分提出的要求，对申请文件进行修改。
☒申请人应当在意见陈述书中论述其专利申请可以被授予专利权的理由，并对通知书正文部分中指出的不符合规定之处进行修改，否则将不能授予专利权。
☐专利申请中没有可以被授予专利权的实质性内容，如果申请人没有陈述理由或者陈述理由不充分，其申请将被驳回。
☐_____

8. 申请人应注意下列事项：

(1) 根据专利法第 37 条的规定，申请人应在收到本通知书之日起的 4 个月内陈述意见，如果申请人无正当理由逾期不答复，其申请被视为撤回。

(2) 申请人对其申请的修改应当符合专利法第 33 条的规定，不得超出原说明书和权利要求书记载的范围，同时申请人对专利申请文件进行的修改应当符合专利法实施细则第 51 条第 3 款的规定，按照本通知书的要求进行修改。

(3) 申请人的意见陈述书和/或修改文本应邮寄或递交国家知识产权局专利局受理处，凡未邮寄或递交给受理处的文件不具备法律效力。

(4) 未经预约，申请人和/或代理人不得前来国家知识产权局专利局与审查员举行会晤。

(5) 对进入实质审查阶段的发明专利申请，在第一次审查意见通知书答复期限届满前（已提交答复意见的除外），主动申请撤回的，可以请求退还 50%的专利申请实质审查费。

9. 本通知书正文部分共有 1 页，并附有下述附件：

☐引用的对比文件的复印件共_____份_____页。
☐_____

审查员：魏臻　　联系电话：020-28958044　　审查部门：专利审查协作广东中心通信发明审查部

第 一 次 审 查 意 见 通 知 书

申请号:2016109087404

本申请涉及一种在无线通信系统中建立上行链路同步的设备和方法。经审查，具体意见如下。

一．权利要求 2,5,8 不符合专利法第二十六条第四款的规定。

1．权利要求 2 请求保护一种根据权利要求 1 所述的方法，其中记载“，所述 UL 定时组由所述多个 CC 当中的以下 CC 来构造：i)中心频率值的差在阈值范围内的至少一个 CC、ii)应用相同的波束成形方案的至少一个 CC、iii)用在相同的无线电网络中的装置中的至少一个 CC 或者 iv)不属于另外的 UL 定时组的至少一个 CC；并且所述 UL 定时组由所述 UE 或所述 eNB 产生”，由于其未择一对所枚举 CC 类型进行选择，本领域技术人员难以确定其究竟是包含上述所枚举的各种类型 CC 均至少一个还是以上所有 CC 中的至少一个，其表意存在歧义，导致权利要求保护范围不清楚，不符合专利法第二十六条第四款的规定。

同理，权利要求 5,8 亦存在类似问题，请申请人一并修改。

二．结论

基于上述理由，本申请按照目前的文本还不能被授予专利权。如果申请人按照本通知书提出的审查意见对申请文件进行修改，克服所存在的缺陷，则本申请可望被授予专利权。

申请人应当在本通知书指定的答复期限内对本通知书提出的问题逐一进行答复，必要时应修改专利申请文件,否则本申请将难以获得批准。请申请人注意：提交修改文本时，应当说明修改的依据，并提交修改替换页以及修改标记/对照页。

另，在答复意见通知书时，只能针对本通知书中提出的问题进行修改，应当符合专利法实施细则第五十一条的规定，主动修改可能会导致文本不被接受；对申请文件的修改应当符合专利法第三十三条的有关规定，不得超出原说明书和权利要求书记载的范围。

审查员姓名:魏臻

审查员代码:152043

纸件申请，回函请寄：100088 北京市海淀区蓟门桥西土城路 6 号 国家知识产权局专利局受理处收

电子申请，应当通过电子专利申请系统以电子文件形式提交相关文件。除另有规定外，以纸件等其他形式提交的文件视为未提交。

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Pantech Wireless, LLC Ex. 2021
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Electronic Acknowledgement Receipt

EFS ID:	39278341
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	146410
Filer:	Seong Jun Park
Filer Authorized By:	
Attorney Docket Number:	GP.009C2
Receipt Date:	27-APR-2020
Filing Date:	02-JAN-2020
Time Stamp:	17:32:00
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	Information Disclosure Statement (IDS) Form (SB08)	IDSform.pdf	613717 14b25f6d634ff28065d01a600a4c047867bb06e0	no	6

Warnings:

Information:					
2	Foreign Reference	CNOA.PDF	214256 2e192e71edaaf0ddcdd16b9307846cbca2459b73	no	5
Warnings:					
Information:					
			Total Files Size (in bytes):	827973	

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.

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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/733,106	01/02/2020	Kibum KWON	GP.009C2

CONFIRMATION NO. 6857

146410
Fidelis Law Group , PLLC
8300 Greensboro Dr Ste L1-101
McLean, VA 22102

PUBLICATION NOTICE

OC000000116833575

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

Publication No.US-2020-0145949-A1
Publication Date:05/07/2020

NOTICE OF PUBLICATION OF APPLICATION

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PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT6105570

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
GOLDPEAK INNOVATIONS INC	05/07/2020

RECEIVING PARTY DATA

Name:	PANTECH CORPORATION
Street Address:	8 YANGJAECHEONRO-21GIL, SUITE 402, SEOCHO-GU,
City:	SEOUL
State/Country:	KOREA, REPUBLIC OF
Postal Code:	06748

PROPERTY NUMBERS Total: 234

Property Type	Number
Patent Number:	10014988
Patent Number:	9548839
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Application Number:	16711269
Application Number:	16806665
Application Number:	16826054
Application Number:	16037067
Application Number:	16184560
Application Number:	16694830

CORRESPONDENCE DATA

Fax Number: (703)643-9789

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

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ATTORNEY DOCKET NUMBER:	PA01GOLDPEAKTOPANTECHCORP
NAME OF SUBMITTER:	YEASUN YOON
SIGNATURE:	/yoon/
DATE SIGNED:	05/13/2020
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 17
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CONFIRMATORY ASSIGNMENT OF PATENT RIGHTS

This CONFIRMATORY ASSIGNMENT OF PATENT RIGHTS (this "**Assignment**") is made this _____ day of April 2020, by **GoldPeak Innovations Inc**, a Korean company ("**Assignor**"), in favor of **Pantech Corporation.**, a Korean company ("**Assignee**").

WHEREAS, Assignor and Assignee are party to that certain Patent Sale and Purchase Agreement of even date herewith (as in effect from time to time, the "**Patent Sale and Purchase Agreement**"); capitalized terms used but not otherwise defined in this Assignment shall have the respective meaning assigned thereto in the Patent Sale and Purchase Agreement; and

WHEREAS, pursuant to the Patent Sale and Purchase Agreement, Assignor has agreed to sell, convey, transfer, assign and deliver to Assignee all right, title and interest, including, without limitation, Patent Rights, in and to the patents, provisional patent applications, and patent applications listed on listed on Schedule A hereto (collectively, the "**Patents**").

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged by Assignor, Assignor hereby sells, conveys, transfers, and assigns to Assignee, its successors, legal representatives and assigns all right, title and interest in the United States and throughout the world in and to:

The Patents and any and all letters patent that are or may be granted thereon, and any legal equivalent and counterpart thereof that may be granted in any country or countries foreign to the United States, in each case including without limitation any extensions, substitutes, continuations, continuations-in-part, divisions, reissues, reexaminations, and renewals thereof, or other equivalents thereof, and further, all rights and privileges pertaining to the Patents and any and all letters patent that are or may be granted thereon, and any legal equivalent thereof that may be granted in any country or countries foreign to the United States as well as all inventions, invention disclosures, and discoveries described in any of the foregoing and including, without limitation, the right, if any, to petition, sue or otherwise seek and recover damages, profits and any other remedy (monetary, injunctive, declaratory or other relief or remedy of any kind) in the United States and anywhere throughout the world for any past, present and future infringement thereof, conversion or misappropriation of, or other injury, offense, violation, breach of duty or wrong relating to, any of the Patents, or any license, agreement, contract or other matter relating thereto.

Assignor hereby authorizes and requests the Commissioner of Patents and Trademarks of the United States of America and the appropriate officers of all other jurisdictions in which the Patents are or may be registered or in which applications included among the Patents are pending, to record the title of Assignee, its successors, legal representatives and assigns, as owner of all right, title and interest in and to the Patents, and to issue to Assignee, its successors, legal representatives and assigns, all letters patent and any legal equivalent thereof that may be granted in any country or countries foreign to the United States and recordations of patent rights resulting from any application included among the Patents, according to this instrument.

Except to the extent that federal law preempts state law with respect to the matters covered hereby, this Assignment shall be governed by and construed in accordance with the laws of the State of Delaware, without giving effect to any of the principles of conflicts of laws thereof that would result in the application of the laws of another jurisdiction to this Assignment.

This Assignment will inure to the benefit of Assignee, its successors, assigns, and other legal representatives and will be binding upon Assignor, its successors, assigns, and other legal representatives.

Assignor has the full power and authority, and has obtained all Third Party consents, approvals and/or other authorizations required to enter into this Assignment and to carry out its obligations hereunder.

If Assignee is unable for any reason to secure Assignor's or its affiliates or their respective successors' or assigns' signature to any document it is entitled to under this Assignment, Assignor and its affiliates hereby irrevocably designate and appoint Assignee, and Assignee's duly authorized officers, agents and representatives, as its agents and attorneys-in-fact, coupled with an interest, with full power of substitution to act for and on the behalf and instead of Assignor, to execute and file any such document or documents and to do all other lawfully permitted acts to further the purposes of this Assignment with the same legal force and effect as if executed by Assignor.

IN WITNESS WHEREOF, Assignor has caused this Assignment to be executed by its duly authorized officer, as of the date first written above.

ASSIGNOR:

GoldPeak Innovations Inc.

By: Saekyung Park

Name: Saekyung Park

Title: CEO

Schedule A

Family	Country	Application #	Application Date	Issued #	Issued Date
1	U.S.A.	2017-406403	1/13/2017	10014988	7/3/2018
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	U.S.A.	2015-726014	5/29/2015	9548839	1/17/2017
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	U.S.A.	2013-750669	1/25/2013	8631297	1/14/2014
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	U.S.A.	2011-012702	1/24/2011	8681599	3/25/2014
	U.S.A.	2009-388243	2/18/2009	7894330	2/22/2011
	TAIWAN	98105169	2/18/2009	I422201	1/1/2014
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	NETHERLAND	13170420.7	2/18/2009	2637348	6/24/2015
	JAPAN	2016-215172	11/2/2016	6401224	9/14/2018
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	JAPAN	2012-037585	2/23/2012	5400186	11/1/2013
	JAPAN	2009-554464	2/13/2009	4982653	5/11/2012
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	FINLAND	13170420.7	6/4/2013	2637348	6/24/2015
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	CHINA	200980000075.7	2/13/2009	101682489	7/24/2013
	CANADA	2715941	2/13/2009	2715941	4/11/2017
	AUSTRALIA	2009332929	2/13/2009	2009332929	11/14/2013
	KR	1020080124084	12/8/2008	925439	10/30/2009
2	U.S.A.	2016-069340	3/14/2016	9750054	8/29/2017

	U.S.A.	2013-960448	8/6/2013	9288824	3/15/2016
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	KR	1020080047656	5/22/2008	1519345	5/6/2015
3	U.S.A.	12/398084	3/4/2009	8380227	2/19/2013
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	U.S.A.	2013-091916	11/27/2013	9357486	5/31/2016
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4	U.S.A.	12/684847	1/8/2010	7853852	12/14/2010
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5	U.S.A.	2016-014792	2/3/2016	9838194	12/5/2017
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	JAPAN	2014-547111	6/12/2015	6212048	9/22/2017
	E.P.O	12857526.3	7/15/2014	2792093	7/11/2018
	GERMANY	12857526.3	5/30/2018	2792093	7/11/2018
	FRANCE	12857526.3	5/30/2018	2792093	7/11/2018
	U.K.	12857526.3	5/30/2018	2792093	7/11/2018
	CHINA	2012-80067029	12/14/2012	ZL201280067029.0	9/1/2017
	KR	1020200034567		Pending	
6	U.S.A.	2016-077466	3/22/2016	9713095	7/18/2017
	U.S.A.	15/653,355	7/18/2017	10045304	08/07/2018
	U.S.A.	2014-357557	5/9/2014	9313743	4/12/2016
	U.S.A.	16/293,321	5/5/2019	10609650	3/31/2020
	JAPAN	2014-540937	6/19/2014	5763845	6/19/2015
	E.P.O	12850075	6/4/2014	2782405	8/22/2018
	GERMANY	12850075	6/4/2014	2782405	8/22/2018
	FRANCE	12850075	6/4/2014	2782405	8/22/2018
	U.K.	12850075	6/4/2014	2782405	8/22/2018
	CHINA	201280056210.1	5/15/2014	ZL201280056210.1	5/15/2018
	KR	1020110119154	11/15/2011	10-1867314	6/7/2018
8	U.S.A.	2016-222068	7/28/2016	9680590	6/13/2017
	U.S.A.	2014-147295	1/3/2014	9419739	8/16/2016
	U.S.A.	2011-332089	12/20/2011	8649346	2/11/2014
	JAPAN	2014-134625	6/30/2014	6025783	10/21/2016
	JAPAN	2013-546010	6/14/2013	5575993	7/11/2014
	E.P.O	11850274.9	7/1/2013	Pending	
	CHINA	201180062059	6/21/2013	103270710	3/9/2016
	KR	1020100131864	12/21/2010	10-1867311	6/7/2018
9	U.S.A.	2016-335679	10/27/2016	9860046	1/2/2018
	U.S.A.	16/392,323	4/23/2019	Pending	
	U.S.A.	2016-992186	1/11/2016	9485072	11/1/2016
	U.S.A.	13/877,827	4/4/2013	9237566	1/12/2016
	JAPAN	2013-533775	5/31/2013	5766294	6/26/2015
	E.P.O	11832776.6	4/4/2013	Pending	
	CHINA	201610452850.4	6/21/2016	106059719	6/14/2019

	CHINA	201180049399	4/12/2013	103181109	8/3/2016
	KR	1020100100988	10/15/2010	10-1771550	8/21/2017
10	U.S.A.	14/056,474	10/17/2013	9008046	4/14/2015
	U.S.A.	2011-181456	7/12/2011	8588185	7/19/2013
	E.P.O	11807024.2	12/11/2012	Pending	
	KR	1020100068157	7/14/2010	10-1699023	1/17/2017
11	U.S.A.	2011-098056	4/29/2011	8780840	7/15/2014
12	U.S.A.	2015-733068	6/8/2015	9854545	12/26/2017
	U.S.A.	15/820,980	11/22/2017	Pending	
	U.S.A.	2012-578531	8/10/2012	9054835	6/9/2015
	JAPAN	2015-154385	8/4/2015	6175466	7/14/2017
	E.P.O	11742487.9	9/5/2012	2536227	5/8/2019
	GERMANY	11742487.9	9/5/2012	2536227	5/8/2019
	U.K.	11742487.9	9/5/2012	2536227	5/8/2019
	FRANCE	11742487.9	9/5/2012	2536227	5/8/2019
	SWITZERLAND	11742487.9	9/5/2012	2536227	5/8/2019
	IRELAND	11742487.9	9/5/2012	2536227	5/8/2019
	Luxembourg	11742487.9	9/5/2012	2536227	5/8/2019
	Monaco	11742487.9	9/5/2012	2536227	5/8/2019
	CHINA	201610908740.4	10/18/2016	Pending	
	CHINA	201180014458.7	9/18/2012	ZL201180014458.7	11/16/2016
	KR	10201100086&3	1/28/2011	10-1803015	11/23/2017
14	U.S.A.	15/206,508	7/11/2016	10299251	5/21/2019
	U.S.A.	16/418,708	5/28/2019	Pending	
	U.S.A.	13/875,808	5/2/2013	9392582	7/12/2016
	U.S.A.	13/875,869	5/2/2013	9131482	9/8/2015
	U.S.A.	2013-965837	8/13/2013	9265034	2/16/2016
	U.S.A.	2010-916203	10/29/2010	8538411	9/17/2013
	JAPAN	2014-080506	4/9/2014	5788051	8/7/2015
	JAPAN	2012-536694	4/23/2012	5525055	4/18/2014
	E.P.O	10827139.6	5/23/2012	Pending	
	KR	1020170127789	9/29/2017	10-1828917	2/7/2018
	KR	1020100088151	9/8/2010	10-1785997	10/10/2017
15	U.S.A.	2015-703360	5/4/2015	9787514	10/10/2017
	U.S.A.	16/272,473	2/11/2019	Pending	
	U.S.A.	15/729,604	10/10/2017	10237104	3/19/2019
	U.S.A.	2013-891522	5/10/2013	9025485	5/5/2015
	JAPAN	2015-511380	11/10/2014	6200944	9/1/2017
	E.P.O	13787400.4	12/3/2014	2850757	10/17/2017
	GERMANY	13787400.4	12/3/2014	2850757	10/17/2017

	FRANCE	13787400.4	12/3/2014	2850757	10/17/2017
	U.K.	13787400.4	12/3/2014	2850757	10/17/2017
	CHINA	201380036116.4	1/6/2015	ZL201380036116.4	11/3/2017
	KR	1020120050406	5/11/2012	Pending	
16	U.S.A.	2016-180153	6/13/2016	9742542	8/22/2017
	U.S.A.	2015-801116	7/16/2015	9369251	6/14/2016
	U.S.A.	16/387,174	4/17/2019	Pending	
	U.S.A.	2014-547112	11/18/2014	9088396	7/21/2015
	U.S.A.	2011-816182	2/8/2013	8897182	11/25/2014
	JAPAN	2016-115490	6/9/2016	6185116	8/4/2017
	JAPAN	2015-053011	3/17/2015	5952449	6/17/2016
	JAPAN	2013-524046	2/8/2013	5718464	3/27/2015
	GERMANY	11816634.7	3/11/2013	2605433	2/27/2019
	FRANCE	11816634.7	3/11/2013	2605433	2/27/2019
	SWITZERLAND	11816634.7	3/11/2013	2605433	2/27/2019
	Luxembourg	11816634.7	3/11/2013	2605433	2/27/2019
	MONACO	11816634.7	3/11/2013	2605433	2/27/2019
	IRELAND	11816634.7	3/11/2013	2605433	2/27/2019
	Belgium	11816634.7	3/11/2013	2605433	2/27/2019
	U.K.	11816634.7	3/11/2013	2605433	2/27/2019
	E.P.O	11816634.7	3/11/2013	2605433	2/27/2019
	CHINA	201610412657.8	8/11/2011	ZL201610412657.8	9/24/2019
	CHINA	201180049114.X	4/11/2013	103155456	6/29/2016
	KR	1020100098006	10/7/2010	1719542	3/20/2017
	KR	1020170033713	3/17/2017	1810962	12/24/2017
	KR	1020100098005	10/7/2010	1790502	
17	U.S.A.	2012-807706	12/28/2012	9136924	9/15/2015
	JAPAN	2013-518260	1/4/2013	6293482	2/23/2018
	E.P.O	11803762	2/1/2013	2592763	5/23/2018
	GERMANY	11803762	2/1/2013	2592763	5/23/2018
	FRANCE	11803762	2/1/2013	2592763	5/23/2018
	U.K.	11803762	2/1/2013	2592763	5/23/2018
	CHINA	201180037814.7	1/31/2013	ZL201180037814.7	11/17/2017
	KR	1020160171540	12/15/2016	10-1771549	8/21/2017
18	U.S.A.	2016-151296	5/10/2016	9948440	4/17/2018
	U.S.A.	2014-299679	6/9/2014	9344245	5/17/2016
	U.S.A.	15/911,518	3/5/2018	Pending	
	U.S.A.	2011-149225	5/31/2011	8787216	7/22/2014
	JAPAN	2013-513109	11/27/2012	5931056	5/13/2016
	E.P.O	11790009	12/5/2012	Pending	

	CHINA	201610951696.5	11/2/2016	Pending	
	CHINA	201180037855.6	1/31/2013	ZL201180037855.6	11/30/2016
	KR	1020100055073	6/10/2010	10-1790505	10/20/2017
19	U.S.A.	2016-192233	6/24/2016	9893866	2/13/2018
	U.S.A.	2014-464041	8/20/2014	9380581	6/28/2016
	U.S.A.	2013-043005	10/1/2013	8837452	9/16/2014
	U.S.A.	2011-008685	1/18/2011	8576822	11/5/2013
	JAPAN	2012-548900	7/11/2012	5855016	12/18/2015
	E.P.O	11733132	8/17/2012	Pending	
	U.S.A.	16/285,957	2/26/2019	10567140	2/18/2020
	U.S.A.	15/858,921	12/29/2017	10218485	2/26/2019
	CHINA	201180014290.X	9/17/2012	102804625	11/13/2018
	KR	1020100004219	1/18/2010	1740221	
20	U.S.A.	2009-505707	5/2/2012	8811518	8/19/2014
	KR	1020127011219	4/30/2012	1627393	5/30/2016
21	U.S.A.	2016-131725	4/18/2016	9825686	11/21/2017
	U.S.A.	2009-500288	4/4/2012	9319252	4/19/2016
	U.S.A.	16/203,319	11/28/2018	Pending	
	U.S.A.	15/814,605	11/16/2017	10153821	12/11/2018
	KR	1020127008173	3/29/2012	1621376	5/10/2016
22	U.S.A.	2015-279139	9/28/2016	10057940	8/21/2018
	U.S.A.	2015-801280	7/16/2015	9474025	10/18/2016
	U.S.A.	2013-847319	3/19/2013	9088992	7/21/2015
	KR	1020120027938	3/19/2012	10-1868865	6/12/2018
23	U.S.A.	2016-183158	6/15/2016	9730265	8/8/2017
	U.S.A.	16/275,039	2/13/2019	Pending	
	U.S.A.	2014-560838	12/4/2014	9374213	6/21/2016
	U.S.A.	2012-651034	10/12/2012	8917619	12/23/2014
	KR	1020110110798	10/27/2011	10-1841693	3/19/2018
24	U.S.A.	2016-341296	11/2/2016	9955376	4/24/2018
	U.S.A.	16/288,278	2/28/2019	Pending	
	U.S.A.	2015-937348	11/10/2015	9516538	12/6/2016
	U.S.A.	2013-984476	8/8/2013	9191833	11/17/2015
	E.P.O	12744488.3	8/9/2013	Notice of Allowance at 1/7/2020 (Issue fee due 5/7/2020)	
	CHINA	201610397886.7	6/7/2016	106060866B	1/7/2020
	CHINA	201280014327	9/22/2013	103444100	6/29/2016
	KR	1020170130604	10/11/2017	1860863	5/17/2018
27	U.S.A.	2014-191178	2/26/2014	9124688	9/1/2015
	U.S.A.	2009-553328	9/3/2009	8675844	3/18/2014

	U.S.A.	2003-730853	12/8/2003	7660404	2/9/2010
	HONG KONG	5101471	2/22/2005	1069062	2/12/2010
	E.P.O	06019434.7	12/5/2003	1727386	3/4/2009
	U.K.	06019434.7	9/18/2006	1727386	3/4/2009
	U.K.	03257661.3	12/5/2003	1427242	11/15/2006
	FRANCE	06019434.7	9/18/2006	1727386	3/4/2009
	E.P.O	03257661.3	12/5/2003	1427242	11/15/2006
	FRANCE	03257661.3	12/5/2003	1427242	11/15/2006
	GERMANY	06019434.7	9/18/2006	1727386	3/4/2009
	GERMANY	03257661.3	12/5/2003	1427242	11/15/2006
	CHINA	200310124920.6	12/7/2003	100558200	11/4/2009
	KR	1020020077576	12/7/2002	500670	7/1/2005
28	U.S.A.	2002-194038	7/11/2002	6809641	10/26/2004
	JAPAN	2002-196495	7/4/2002	3684373	6/10/2005
	CHINA	02140676.6	7/12/2002	101271871	8/23/2006
	KR	1020010041909	7/12/2001	420395	2/16/2004
29	U.S.A.	14/225,729	3/26/2014	8933955	12/23/2014
	U.S.A.	2013-035625	9/24/2013	8706168	4/22/2014
	U.S.A.	2012-654043	10/17/2012	8554185	10/8/2013
	U.S.A.	2009-412079	3/26/2009	8311519	11/13/2012
	JAPAN	2009-133842	6/4/2009	4764496	6/17/2011
	KR	1020080052642	6/4/2008	1481408	1/6/2015
30	U.S.A.	2004-007603	12/7/2004	7260419	8/21/2007
	KR	1020030088563	12/8/2003	603437	7/13/2006
31	U.S.A.	14/061316	10/23/2013	Pending	
	U.S.A.	2012-649539	10/11/2012	RE44620	7/9/2013
	U.S.A.	2011-300799	11/21/2011	RE43789	11/6/2012
	U.S.A.	2009-612327	11/4/2009	RE42996	12/6/2011
	U.S.A.	2004-882604	6/30/2004	7292561	11/6/2007
	KR	1020030087886	12/5/2003	633741	10/4/2006
32	U.S.A.	2013-861177	4/11/2013	9661113	5/23/2017
	U.S.A.	2010-716600	3/3/2010	8433379	4/30/2013
	U.S.A.	2005-106118	4/13/2005	7693558	4/6/2010
	KR	1020040025922	4/14/2004	598062	6/30/2006
33	U.S.A.	2011-171344	6/28/2011	8200899	6/12/2012
	U.S.A.	2009-362760	1/30/2009	7991958	8/2/2011
	KR	1020080046505	5/20/2008	985617	9/29/2010
34	U.S.A.	2005-295202	12/6/2005	7567530	7/28/2009
37	U.S.A.	2002-253256	9/24/2002	7136671	11/14/2006
38	U.S.A.	2015-929965	11/2/2015	9729699	8/8/2017

	U.S.A.	2014-196273	3/4/2014	9178982	11/3/2015
	U.S.A.	2013-746125	1/21/2013	8699987	4/15/2014
	U.S.A.	2009-625191	11/24/2009	8374572	2/12/2013
	U.S.A.	15/672,018	8/8/2017	10158752	12/18/2018
	U.S.A.	2003-749788	12/30/2003	7643815	1/5/2010
40	U.S.A.	2010-944436	11/11/2010	8060114	11/15/2011
	U.S.A.	2010-693142	1/25/2010	7912482	3/22/2011
	KR	1020040088333	11/2/2004	0632667	9/28/2006
	U.S.A.	2004-021778	12/23/2004	7668553	2/23/2010
41	U.S.A.	2004-879638	7/26/2004	7151487	12/19/2006
	U.S.A.	2003-749598	12/30/2003	6784829	8/31/2004
	CHINA	200410064136.5	8/19/2004	ZL200410064136.5	4/20/2011
	KR	1020030057848	8/21/2003	540248	12/23/2005
42	U.S.A.	2003-750000	12/30/2003	7006037	2/28/2006
	KR	1020030033022	5/23/2003	543308	1/6/2006
43	U.S.A.	16/287,787	2/27/2019	Pending	
	U.S.A.	2014-307326	6/17/2014	9495730	11/15/2016
	U.S.A.	2012-669162	11/5/2012	8767018	7/1/2014
	U.S.A.	13/363,428	2/1/2012	8319799	11/27/2012
	U.S.A.	2010-814262	6/11/2010	8120626	2/21/2012
	U.S.A.	2006-453433	6/28/2006	7755647	7/13/2010
	CHINA	200610095738.6	6/28/2006	101982805	6/15/2011
	KR	1020050056173	6/28/2005	756129	8/30/2007
44	U.S.A.	2011-275103	10/17/2011	8446915	5/21/2013
	U.S.A.	2010-716575	3/3/2010	8054846	11/8/2011
	U.S.A.	2006-441981	5/26/2006	7693163	4/6/2010
	KR	1020050045625	5/30/2005	653527	11/27/2006
45	U.S.A.	2004-933670	9/3/2004	7102196	9/5/2006
	KR	1020030062570	9/8/2003	539960	12/22/2005
46	U.S.A.	2002-214430	8/8/2002	6801271	10/5/2004
	JAPAN	2002-214711	7/24/2002	3773472	2/24/2006
	E.P.O	02014550	7/1/2002	1 316 841	1/1/2014
	U.K.	02014550	7/1/2002	1 316 841	1/1/2014
	FRANCE	02014550	7/1/2002	1 316 841	1/1/2014
	GERMANY	02014550	7/1/2002	02 014 550.4	1/1/2014
	CHINA	02140295.7	7/4/2002	ZL02140295.7	2/2/2005
	KR	1020010075793	12/3/2001	432009	5/7/2004
47	U.S.A.	2002-071750	2/6/2002	6925313	8/2/2005
	JAPAN	2002-031225	2/7/2002	4034079	11/2/2007
	ITALY	02250854	2/7/2002	1231757	11/15/2006

	HONG KONG	02109172.9	12/18/2002	1047666	3/4/2005
	E.P.O	02250854	2/7/2002	1231757	11/15/2006
	U.K.	02250854	2/7/2002	1231757	11/15/2006
	FRANCE	02250854	2/7/2002	1231757	11/15/2006
	GERMANY	02250854	2/7/2002	1231757	11/15/2006
	CHINA	02106877.1	2/7/2002	ZL02106877.1	10/6/2004
48	U.S.A.	2009-645912	12/23/2009	8270999	9/18/2012
	U.S.A.	2006-647636	12/28/2006	7660592	2/9/2010
	KR	1020050133300	12/29/2005	651594	11/22/2006
49	U.S.A.	2013-860672	4/11/2013	9204118	8/14/2015
	U.S.A.	2010-686822	1/13/2010	8433367	4/30/2013
	U.S.A.	2008-217175	7/2/2008	7668569	2/23/2010
	U.S.A.	2005-255610	10/21/2005	7412262	8/12/2008
	JAPAN	2010-099211	4/22/2010	5210347	3/1/2013
	JAPAN	2005-309910	10/24/2005	4557864	7/30/2010
	GERMANY	102005053671.9	11/10/2005	102005053671	12/24/2008
	CHINA	200510120388.x	11/11/2005	ZL200510120388.X	4/1/2009
	KR	1020040101848	12/6/2004	620741	8/29/2006
50	U.S.A.	2005-106160	4/13/2005	7283839	10/16/2007
	HONG KONG	06103630.4	3/22/2006	1083574	10/15/2010
	E.P.O	05252337	4/14/2005	1587288	11/3/2010
	U.K.	05252337	4/14/2005	1587288	11/3/2010
	FRANCE	05252337	4/14/2005	1587288	11/3/2010
	GERMANY	05252337	4/14/2005	1587288	11/3/2010
	KR	1020040083073	10/18/2004	572464	4/18/2006
	CHINA	200510079253.3	4/14/2005	101694372	5/26/2010
51	U.S.A.	2000-655036	9/5/2000	6557010	4/29/2003
	JAPAN	2000-272619	9/8/2000	3638249	1/21/2005
52	U.S.A.	2002-185141	6/27/2002	7103387	9/5/2006
	JAPAN	2002-201859	7/10/2002	3917027	2/16/2007
	E.P.O	02254584	6/28/2002	1309157	8/17/2011
	U.K.	02254584	6/28/2002	1309157	8/17/2011
	FRANCE	02254584	6/28/2002	1309157	8/17/2011
	GERMANY	02254584	6/28/2002	1309157	8/17/2011
	CHINA	02140907.2	7/9/2002	ZL02140907.2	6/4/2008
	KR	1020010067663	10/31/2001	438208	6/21/2004
53	U.S.A.	15/131,746	4/18/2016	9839000	12/05/2017
	U.S.A.	15/801,433	11/2/2017	Pending	
	U.S.A.	14/563,058	12/8/2014	9319507	4/19/2016
	U.S.A.	2013-972475	8/21/2013	8923927	12/10/2014

	U.S.A.	2011-052836	3/21/2011	8532626	9/10/2013
	U.S.A.	2008-183506	7/31/2008	7925242	4/12/2011
	U.S.A.	2006-354608	2/14/2006	7420566	9/2/2008
	KR	1020050012498	2/15/2005	610487	8/1/2006
54	KR	1020050009451	2/2/2005	656670	12/5/2006
	U.S.A.	2005-134778	5/19/2005	7475332	1/6/2009
55	U.S.A.	2012-676214	11/14/2012	8588755	6/17/2013
	U.S.A.	12/816,688	6/16/2010	8331920	12/11/2012
	KR	1020090065796	7/20/2009	1026905	3/28/2011
56	U.S.A.	2006-580741	10/12/2006	7636845	12/22/2009
	KR	1020050123711	12/15/2005	755536	8/29/2007
57	U.S.A.	2011-311458	12/5/2011	8565724	10/22/2013
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	U.S.A.	2003-602810	6/24/2003	7386297	6/10/2008
	CHINA	03127468.4	6/30/2003	ZL03127468.4	12/5/2007
	KR	1020020085938	12/28/2002	551421	2/3/2006
62	U.S.A.	2016-082832	3/28/2016	9596352	3/14/2017
	U.S.A.	14/685,143	4/13/2015	9300805	3/29/2016
	U.S.A.	2013-058968	10/21/2013	9008637	4/14/2015
	U.S.A.	2011-182024	7/13/2011	8583098	7/8/2013
	U.S.A.	15/457,560	3/13/2017	10009471	06/26/2018
	U.S.A.	15/988,020	5/24/2018	10257359	4/9/2019
	KR	1020110000808	1/5/2011	1308192	9/6/2013
63	U.S.A.	15/338,993	10/31/2016	9769776	9/19/2017
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	U.S.A.	16/424,258	5/28/2019	10582460	3/3/2020
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	U.S.A.	13/849,296	3/22/2013	8964645	2/24/2015
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64	U.S.A.	2016-173139	6/3/2016	9794029	10/17/2017
	U.S.A.	16/227,369	12/20/2018	Pending	
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	U.S.A.	2013-888891	5/7/2013	9030973	5/12/2015
	JAPAN	2015-511358	11/7/2014	6132370	4/28/2017
	E.P.O	13788210.6	5/7/2013	2850758	9/5/2018
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	U.S.A.	13/978524	7/5/2013	8934440	1/13/2015
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66	U.S.A.	2014-754045	6/29/2015	10103916	10/16/2018
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67	U.S.A.	15/167,518	5/27/2016	10162490	12/25/2018
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	FRANCE	09156335.3	3/26/2009	2117208	1/26/2011
	U.K.	09156335.3	3/26/2009	2117208	1/26/2011
	NETHERLAND	09156335.3	3/26/2009	2117208	1/26/2011
	KR	1020080042843	5/8/2008	986376	10/1/2010
68	U.S.A.	15/017,133	2/5/2016	Pending	
	U.S.A	2013-758444	2/4/2013	9256747	2/9/2016
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69	U.S.A.	2016-010629	1/29/2016	9575631	2/21/2017
	U.S.A.	2015-840844	8/31/2015	9250957	2/2/2016
	U.S.A.	2006-495863	7/28/2006	9122518	4/22/2015
	U.S.A.	15/436,299	2/17/2017	10282054	5/7/2019
	U.S.A.	16/405,803	5/7/2019	Pending	
	KR	1020050073877	8/11/2005	642847	10/30/2006
71	U.S.A.	2016-354691	11/17/2016	9930499	3/27/2018
	U.S.A.	14/827,716	8/17/2015	9503559	11/22/2016
	U.S.A.	2014-152152	1/10/2014	9113312	8/18/2015
	U.S.A.	2011-191363	7/26/2011	8634818	1/21/2014
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	FRANCE	11176526.9	11/29/2018	2424170	12/19/2018
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	U.S.A.	15/911,495	3/5/2018	10225697	3/5/2019
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74	U.S.A.	2008-599463	11/9/2009	8279744	5/22/2012
	JAPAN	2013-035032	2/25/2013	5628948	9/2/2014
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75	U.S.A.	2005-285960	11/23/2005	7881723	2/1/2011
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	KR	1020040096090	11/23/2004	650058	11/20/2006
76	JAPAN	2013-021345	2/6/2013	5411369	11/15/2013
	KR	1020120023831	3/8/2012	1314472	9/26/2013
77	U.S.A.	2011-195563	8/1/2011	8606284	12/10/2013
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	U.K.	11177039.2	8/10/2011	2424309	12/4/2013
	FRANCE	11177039.2	8/10/2011	2424309	12/4/2013
	GERMANY	11177039.2	8/10/2011	2424309	12/4/2013
	CHINA	201110253571.2	8/30/2011	102387527	12/3/2014
	KR	1020100084319	8/30/2010	1318013	10/7/2013
78	U.S.A.	2013-857294	4/5/2013	9072108	2/18/2015
	U.S.A.	2011-012753	1/24/2011	8433350	12/28/2012
	U.S.A.	2007-846093	8/29/2007	7890130	2/15/2011
	TAIWAN	096131797	8/28/2007	I 377799	8/24/2012
	MEXICO	MX/a/2007/010613	8/30/2007	274942	4/6/2010
	JAPAN	2007-223594	8/30/2007	4685842	1/13/2011
	U.K.	07253398	8/29/2007	1895795	3/9/2016
	FRANCE	07253398	8/29/2007	1895795	3/9/2016
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	CHINA	200710147192.9	8/30/2007	ZL 200710147192.9	11/16/2010
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79	U.S.A.	2012-412933	3/6/2012	9167534	6/8/2015
	U.S.A.	2007-846106	8/29/2007	8145252	11/16/2011
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81	U.S.A.	2005-285943	11/23/2005	7577115	8/18/2009
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	NETHERLAND	05257261.7	11/25/2005	1662671	11/3/2010
	U.K.	05257261.7	11/25/2005	1662671	11/3/2010
	FRANCE	05257261.7	11/25/2005	1662671	11/3/2010
	FINLAND	05257261.7	11/25/2005	1662671	11/3/2010
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	CHINA	200510121565.6	11/25/2005	ZL200510121565.6	4/30/2008
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83	U.S.A.	2002-330737	12/27/2002	7167716	1/23/2007
	HONG KONG	03108579.9	11/25/2003	1056450	8/18/2006
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84	U.S.A.	2011-143688	7/7/2011	8559480	10/15/2013
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	E.P.O	10733619.0	6/29/2011	2381584	8/8/2018
	FRANCE	10733619.0	1/15/2010	2381584	8/8/2018
	GERMANY	10733619.0	1/15/2010	2381584	8/8/2018
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	CHINA	201080004784.5	7/18/2011	ZL 201080004784.5	11/26/2014
	KR	1020090004682	1/20/2009	991957	10/28/2010
85	U.S.A.	2009-629570	12/2/2009	8345867	1/1/2013
	JAPAN	2011-538568	5/27/2011	5230820	3/29/2013
	E.P.O	9830590.7	12/2/2009	2359512	8/24/2016
	GERMANY	9830590.7	12/2/2009	2359512	8/24/2016
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	U.K.	09830590.7	12/2/2009	2359512	8/24/2016
	CHINA	200980148059.5	5/31/2011	ZL200980148059.2	7/28/2014
	KR	1020080121495	12/2/2008	1037520	5/20/2011
86	U.S.A.	2010-383821	1/12/2012	9009207	4/14/2015
	E.P.O	10800014.2	2/10/2012	2456117	9/9/2015
	U.K.	10800014.2	2/10/2012	2456117	9/9/2015
	FRANCE	10800014.2	2/10/2012	2456117	9/9/2015
	GERMANY	10800014.2	2/10/2012	2456117	9/9/2015
	CHINA	201080037807.2	2/24/2012	ZL201080037807.2	4/15/2016
	KR	1020090063719	7/13/2009	1685173	12/5/2016
88	U.S.A.	12/582,164	10/20/2009	8675510	10/31/2013
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89	U.S.A.	12/958,749	12/2/2010	Pending	

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	KR	1020050088083	9/22/2005	694378	3/6/2007
90	U.S.A.	16/452,244	6/25/2019	Pending	
	U.S.A.	2012-653969	10/17/2012	9398499	7/19/2016
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91	U.S.A.	2011-177761	7/7/2011	8929223	12/17/2014
	KR	1020100136900	12/28/2010	1266692	5/14/2013
92	U.S.A.	12/832,665	7/8/2010	8301151	6/29/2012
	KR	1020090098752	10/16/2009	1065092	9/7/2011
93	U.S.A.	2009-539364	10/12/2009	RE43930	8/30/2012
	U.S.A.	2004-835876	4/29/2004	7257410	8/14/2007
	KR	1020030061086	9/2/2003	511554	8/24/2005
94	U.S.A.	12/759,974	4/14/2010	RE43059	1/3/2012
	U.S.A.	2003-729755	12/4/2003	7366222	4/29/2008
	KR	1020020083746	12/24/2002	470401	1/27/2005
95	U.S.A.	2005-263858	11/2/2005	7904025	3/8/2011
	KR	1020040103715	12/9/2004	698665	3/15/2007
96	U.S.A.	12/861,637	8/23/2010	8098624	1/17/2012
	U.S.A.	2005-132400	5/19/2005	7801074	9/21/2010
	KR	1020040059401	7/28/2004	620713	8/29/2006
97	U.S.A.	2003-744321	12/22/2003	7333828	2/19/2008
	KR	2003-0098663	12/31/2002	598055	7/10/2006
98	U.S.A.	2003-749456	12/31/2003	7123912	10/17/2006
	KR	1020030026991	4/29/2003	0592885	6/16/2006

PTO/AIA/80 (07-17)
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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
6 Yangjaedaeseong-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 YangWon 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.**

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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.

PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: PANTECH CORPORATION

Application No./Patent No.: 16/733,106 Filed/Issue Date: 01-02-2020

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

PANTECH 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: 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.

2. 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.

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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/	2020-06-16
Signature	Date
Yeasun Yoon	73663
Printed or Typed Name	Title or Registration 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.

Doc Code: R46C.REQ
Document Description: Request under 37 CFR 1.46(c) to correct, update or change the applicant.

PTO/AIA/41 (04-15)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
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.

REQUEST TO CORRECT OR UPDATE THE NAME OF THE APPLICANT UNDER 37 CFR 1.46(c)(1), OR CHANGE THE APPLICANT UNDER 37 CFR 1.46(c)(2)
(FOR USE ONLY IN APPLICATIONS FILED ON OR AFTER SEPTEMBER 16, 2012)

Application Number	16/733,106
Filing Date	01-02-2020
First Named Inventor	Kibum KWON
Art Unit	2462
Examiner Name	MESFIN, YEMANE
Practitioner Docket Number	PPA0010US

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant hereby **requests that the name of the applicant be corrected or updated under 37 CFR 1.46(c)(1), or that the applicant be changed under 37 CFR 1.46(c)(2),** in the above-identified application. **Requests under 37 CFR 1.46(c)(1) or (c)(2) cannot be submitted after payment of the issue fee or if the application has been patented.**

Please check the applicable box(es) below.

☐ 1. This request is to **correct or update the name of the applicant** (**under 37 CFR 1.46(c)(1)**) and includes:

☐ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) with the corrected or updated information shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). A Corrected Web-based ADS may be used.

Note: Requests under 37 CFR 1.46(c)(1) may be filed to correct typographical errors in the name of the § 1.46 applicant, or for updating the name of the § 1.46 applicant (*i.e.*, where there is no change in the applicant itself but just in the applicant's name). See the Manual of Patent Examining Procedure (MPEP) section 605.01.

■ 2. This request is to **change the applicant** (**under 37 CFR 1.46(c)(2)**) and includes:

■ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) that identifies the changes with proper markings (underlining for insertions and strikethrough for deletions). A Corrected Web-based ADS may be used.

■ A Statement Under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent). See MPEP 325.

I am the

☐ applicant* ■ attorney or agent of record Registration number 73663 ☐ attorney or agent acting under 37 CFR 1.34 Registration number _____

Signature /Yeasun Yoon, Reg.# 73663/

Typed or printed name Yeasun Yoon

Date 2020-06-16

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. *Juristic entities must be represented by a patent practitioner (See 37 CFR 1.31, applicable to any paper filed on or after September 16, 2012 that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below**.

☐ ** Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.36. 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.

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.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~GP.009C2~~ PPA0010US
	Application Number	16/733,106
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. Add

Correspondence Information:

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~GP-009C2~~ PPA0010US
	Application Number	16/733,106
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	~~146410~~ 167455		
Email Address	~~edward.park@fidelis-laws.com~~ patent@capitoliplaw.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	~~GP-009C2~~ PPA0010US	**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	~~146410~~ 167455		

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~CP-009C2~~ PPA0010US
	Application Number	16/733,106
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			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15820980	2017-11-22
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15820980	Continuation of	14733068	2015-06-08
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
14733068	Continuation of	13578531	2012-08-10
Prior Application Status			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. Add

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).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10-2011-0008683	KR	2011-01-28	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~CP-009C2~~ PPA0010US
	Application Number	16/733,106
Title of Invention	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM	

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10-2010-0027230	KR	2010-03-26	
			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	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. Add

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	~~GP.009C2~~ PPA0010US
	Application Number	16/733,106
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.

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~GP-009C2~~ PPA0010US
	Application Number	16/733,106
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 Remove

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	~~GOLDPEAK INNOVATIONS INC~~ Pantech Corporation		
Mailing Address Information For Applicant:			
Address 1	~~SUITE #806, DIGITAL-RO 34-GIL, 55, GURO-GU~~ 8 Yangjaecheonro-21gil, Suite 402, Seocho-gu		
Address 2			
City	Seoul	**State/Province**	
Country	KR	Postal Code	~~08378~~ 06748
Phone Number		Fax Number	
Email Address			

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

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.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~GP-009C2~~ PPA0010US
	Application Number	16/733,106
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.

Remove

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. Add

Signature:

Remove

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	/Yeasun Yoon, Reg.# 73663/			Date (YYYY-MM-DD)	2020-06-16
First Name	**Yeasun**	Last Name	**Yoon**	Registration Number	**73663**

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

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	~~GP-009C2~~ PPA0010US
	Application Number	16/733,106
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 CooperationTreaty.

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner: MESFIN, YEMANE
Kibum KWON et al.	Group Art Unit: 2462
Application No.: 16/733,106	Confirmation No.: 6857
Filing Date: January 2, 2020	Attorney Docket No.: PPA0010US

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

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CORRECTED OFFICIAL FILING RECEIPT

Sir or Madam:

Applicant respectfully request for a corrected Official Filing Receipt for the above-identified patent application. In particular, it is requested that the Applicant be changed to "Pantech Corporation", as indicated in the accompanying marked-up Application Data Sheet, marked-up Official Filing Receipt, and Request to Change The Applicant Under 37 CFR 1.46(c)(2) (PTO/AIA/41). Applicant also requests that the Attorney Docket Number be updated to "PPA0010US" and Customer Number to "167455".

Respectfully submitted,

/Yeasun Yoon, Reg.# 73663/

Yeasun Yoon
Reg. No. 73,663

Date: June 16, 2020

CUSTOMER NO. 167455
Capitol IP Law Group, PLLC

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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/733,106	01/02/2020		1880	~~GP.009C2~~ PPA0010US	2	2

CONFIRMATION NO. 6857

146410
Fidelis Law Group , PLLC
8300 Greensboro Dr Ste L1-101
McLean, VA 22102

FILING RECEIPT

OC000000114195112

Date Mailed: 01/27/2020

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.

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Inventor(s)

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

Applicant(s)

Pantech Corporation ~~GOLDPEAK INNOVATIONS INC,~~ Seoul, KOREA, REPUBLIC OF;

Power of Attorney: The patent practitioners associated with Customer Number ~~146410~~ 167455

Domestic Priority data as claimed by applicant

This application is a CON of 15/820,980 11/22/2017
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: 01/23/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/733,106**

Projected Publication Date: 05/07/2020

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

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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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

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Pantech Wireless, LLC Ex. 2021
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technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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Pantech Wireless, LLC Ex. 2021
Page 162 of 345

Electronic Acknowledgement Receipt

EFS ID:	39739717
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
Title of Invention:	APPARATUS AND METHOD FOR ESTABLISHING UPLINK SYNCHRONIZATION IN A WIRELESS COMMUNICATION SYSTEM
First Named Inventor/Applicant Name:	Kibum KWON
Customer Number:	146410
Filer:	Yeasun Yoon
Filer Authorized By:	
Attorney Docket Number:	GP.009C2
Receipt Date:	16-JUN-2020
Filing Date:	02-JAN-2020
Time Stamp:	23:25:42
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	PPA0010US-poa.pdf	1663310 24f6115a6b24ad9148e3c0d53405ec852e18e931	no	2

Warnings:

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	PPA0010US-373.pdf	161965 c1bd301971a09dc892e397a2b1392356b7391d87	no	3
Warnings:					
Information:					
3	Req to correct/update/change appl name until pay issue fee	PPA0010US-requestchangeapplicant.pdf	215027 7a533f2649bd937bbf28bcf362d575d4d48d33bb	no	2
Warnings:					
Information:					
4	Application Data Sheet	PPA0010US-markedupads.pdf	362036 c73312e7273f31cfad478f62b5083fadbf71cb25	no	9
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
5	Request for Corrected Filing Receipt	PPA0010US-requestcfr_.pdf	161464 e4e613cf942f5ad2a3a1e87d2fbf34e06f9a84f9	no	1
Warnings:					
Information:					
6	Request for Corrected Filing Receipt	PPA0010US-markedupofr_.pdf	4064303 79d4888fca3457b1efb73133b275aeb5c77c7db0	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	6628105		

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.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/733,106	01/02/2020	Kibum KWON	GP.009C2

CONFIRMATION NO. 6857

POWER OF ATTORNEY NOTICE

146410
Fidelis Law Group , PLLC
8300 Greensboro Dr Ste L1-101
McLean, VA 22102

OC000000117828497

Date Mailed: 06/18/2020

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/16/2020.

- 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**.

/ggasgedom/

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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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
16/733,106	01/02/2020	Kibum KWON	PPA0010US

CONFIRMATION NO. 6857

POA ACCEPTANCE LETTER

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

OC000000117828549

Date Mailed: 06/18/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 06/16/2020.

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**.

/ggasgedom/

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/733,106	01/02/2020	2462	1880	PPA0010US	2	2

CONFIRMATION NO. 6857

CORRECTED FILING RECEIPT

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

OC000000117828631

Date Mailed: 06/18/2020

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.

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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 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: 01/23/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/733,106**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

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

Preliminary Class

370

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

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Pantech Wireless, LLC Ex. 2021
Page 169 of 345

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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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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SelectUSA

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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

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Pantech Wireless, LLC Ex. 2021
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/733,106	01/02/2020	Kibum KWON	PPA0010US	6857

167455 7590 09/02/2020

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

EXAMINER	
TRUONG, LAN-HUONG	

ART UNIT	PAPER NUMBER
2464	

NOTIFICATION DATE	DELIVERY MODE
09/02/2020	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

Office Action Summary	Application No. 16/733,106	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 --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 01/02/2020.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-2 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-2 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, 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.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 01/02/2020 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☑ 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. 14/733,068.

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

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 response to the application filed on 01/02/2020.

3. Claims 1-2 are pending and herein considered.

Oath/Declaration

4. The receipt of oath/declaration is acknowledge.

Drawings

5. The drawings were received on 01/02/2020. These drawings are reviewed and accepted by the Examiner.

Information Disclosure Statement

6. The information disclosure statement (IDS), submitted on 04/27/2020, is in compliance with the provisions of 37 CRR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Double Patenting

7. 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 patentable 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 and 2 is/are rejected on the ground of nonstatutory double patenting as being unpatentable over claim(s) 1 – 20 of U.S. Patent No. 9,054,835. Although the claims at issue are not identical, they are not patentably distinct from each other because the patent anticipates the current application where the patent and the application are directed to method comprising receiving, at a user equipment (UE), a Radio Resource Control (RRC) message through a primary Component Carrier (CC),

wherein the primary CC belongs to a first timing group, the RRC message comprises information related to a second timing group, the second timing group includes a secondary CC and receiving, at the UE, information indicating a random access preamble.

Claim Rejections - 35 USC § 103

8. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

> 1. Determining the scope and contents of the prior art.
> 2. Ascertaining the differences between the prior art and the claims at issue.
> 3. Resolving the level of ordinary skill in the pertinent art.
> 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 2 are rejected under pre-AIA 35 U.S.C 103(a) as being unpatentable over of Yoo et al. (U.S. 2009/0279495) in view of Marinier et al.

(U.S 2012/0008600) further in view of ZTE, "Impact analysis of multiple TA", 3GPP TSG RAN WG2#68bis, R2-100308, Valencia, Spain, 18-22, January 2010; hereinafter "Valencia".

For citation purposes, hereinafter, the Office Action refers to the cited by Marinier et al. with provisional 61/293271, which qualifies as prior art date.

For claim 1:

Yoo discloses a communication method *(see Yoo, paragraph [0007]; communication between the UE and the BS)* comprising:

receiving, at a user equipment (UE), a Radio Resource Control (RRC) message through a primary Component Carrier (CC) *(see Yoo, figure 6; steps S130-S150; paragraph [0054]-[0057]; the BS transmits a random access response message to the UE and upon receipt of the RRC signaling the BS transmits RRC signaling for uplink transmission from its RRC layer to the RRC layer of the UE; also see [0016]-[0017]; [0012]; [0041]; [0057]);* wherein the primary CC belongs to a first timing group, the RRC message comprises information related to a second timing group, the second timing group includes a secondary CC;

receiving, at the UE, information indicating a random access preamble *(see Yoo, paragraph [0051]; uplink time alignment between the UE and BS, a random access procedure is performed via a random access preamble)* ;

transmitting, at the UE, the random access preamble through the secondary CC; and receiving, at the UE, a random access response through the primary CC *(see Yoo, paragraph [0051]; [0064]; the BS transmits a random access response message to the UE; figure 2; step S230).*

Yoo does not explicitly disclose wherein the primary CC belongs to a first timing group, the RRC message comprises information related to a second timing group, the second timing group includes a secondary CC;

Marinier, from the same or similar fields of endeavor, 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 *(see Marinier, paragraph [0021]-[0029])*.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have a system comprises multiple UL timing groups as taught by Marinier. The motivation for doing this is to provide a system networks can utilize these resources, the WTRU is expected to be in sync with the network on these carriers.

Valencia, from the same or similar fields of endeavor, also discloses PRACH resources may be available on multiple UL CCs for carrier aggregation and UE try to receive RAR after it transmitted preamble and UL synchronization for the first configured/activated CC in a CC group *(see Valencia, section 3.1, 3.2 and conclusion)*.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have a system comprises multiple UL CCs for carrier aggregation and multiple UL timing groups as taught by Valencia. The motivation for doing this is to provide a system networks can obtainment of initial timing advanced (TA) and maintenance of the TA in carrier aggregation environment.

For claim 2:

For claim 2, claim 2 is directed to an apparatus which has similar scope as claim 1. Therefore, claim 2 remains un-patentable for the same reasons.

Conclusion

The prior arts made or record and not relied upon are considered pertinent to applicant's disclosures. Baldemair et al. (U.S 2012/0099577); Kim et al. (U.S 2012/0113939).

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.

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
08/28/2020

Notice of References Cited	Application/Control No. 16/733,106	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-20090279495-A1	11-2009	Yoo; Hee Chul	H04L5/0078	370/329
*	B	US-20120008600-A1	01-2012	Marinier; Paul	H04W74/0833	370/336
*	C	US-20120099577-A1	04-2012	Baldemair; Robert	H04W56/0065	370/338
*	D	US-20120113939-A1	05-2012	Kim; So Yeon	H04W74/006	370/329
	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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	Art Unit
	LAN-HUONG TRUONG	2464

CPC - Searched*		
Symbol	Date	Examiner
H04W56/0005; H04W76/27; H04W74/004; H04W56/0045; H04W88/08; H04W92/10; H04W56/0015; H04W74/08	08/26/2020	LT
H04L5/001; H04L5/0007	08/26/2020	LT
H04B1/7087	08/26/2020	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	08/26/2020	LT
East searching performed	08/26/2020	LT
IEEE, 3GPP and IP searching performed	08/26/2020	LT
Text searching performed	08/26/2020	LT
Internet Google Patent search	08/26/2020	LT
Double Patenting searching performed	08/26/2020	LT

IPR2023-01269
Pantech Wireless, LLC Ex. 2021
Page 182 of 345

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	Art Unit
	LAN-HUONG TRUONG	2464

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

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Pantech Wireless, LLC Ex. 2021
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	Art Unit
	LAN-HUONG TRUONG	2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	08/26/2020								
	1	✓								
	2	✓								

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CONFIRMATION NO. 6857

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
16/733,106	01/02/2020	370	2464	PPA0010US

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 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 ****
01/23/2020

Foreign Priority claimed	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No ☐ Met after Allowance Verified and Acknowledged /LAN HUONG TRUONG/ Examiner's Signature Initials	KOREA, REPUBLIC OF	11	2	2

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

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

FILING FEE RECEIVED		
1880	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

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16733106
Filing Date	2020-04-27
First Named Inventor	Ki Bum KWON
Art Unit	2462
Examiner Name	MESFIN, YEMANE
Attorney Docket Number	GP.009C2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8606336		2013-12-10	Womack, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090274120		2009-11-05	Chou	
	2	20100111005		2010-05-06	Ahn, et al.	
	3	20100041399		2010-02-18	kim, et al.	
	4	20100238857		2010-09-23	Zhang,et al.	
	5	20100323744		2010-12-23	Kim, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /L.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16733106
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	First Named Inventor	Ki Bum KWON
	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
	Attorney Docket Number	GP.009C2

	6	20100118720		2010-05-13	Gauvreau, et al.	
	7	20110170495		2011-07-14	Earnshaw, et al.	
	8	20090316642		2009-12-24	Yamada, et al.	
	9	20090318175		2009-12-24	Sandberg	
	10	20100086065		2010-04-08	Higuchi, et al.	
	11	20090270094		2009-10-29	Ito, et al.	
	12	20090116434		2009-05-07	Lohr, et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	10-2009-0115913	KR		2009-11-10	Industrial Technology Research Institute		
	2	10-2008-0063023	KR		2008-07-03	Posdata Co., Ltd.		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /L.T/

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	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
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	3	10-2008-0079961	KR		2008-09-02	LG Electronics Inc.		
	4	2009/113815	WO		2009-09-17	LG ELECTRONICS INC.		
	5	2013-516917	JP		2013-05-13	INTER DIGITAL PATENT HOLDINGS, INC.		
	6	2010-254386	JP		2010-11-11	MITSUBISHI ELECTRIC BUILDING TECHNO SERVICE CO LTD		

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	International Search Report of PCT/KR2011/000909 dated December 7, 2011.	
	2	Non Final Office Action issued on July 16, 2014, in U.S. Application No. 13/578,531.	
	3	Notice of Allowance issued on February 4, 2015, in U.S. Application No. 13/578,531.	
	4	Qualcomm Incorporated, "Supporting multiple timing advance groups", 3GPP TSG-RAN WG2 meeting#68bis, January 18-22, 2010, R2-100423, Valencia, Spain.	
	5	ITRI, "Time Alignment Timer for different TA", 3GPP TSG-RAN WG2 meeting#68bis, January 18-22, 2010, R2-100560, Valencia, Spain.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /L.T/

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	First Named Inventor	Ki Bum KWON
	Art Unit	2462
	Examiner Name	MESFIN, YEMANE
	Attorney Docket Number	GP.009C2

	6	NTT DOCOMO, INC., "TA maintenance for CA", 3GPP TSG-RAN2#68bis, January 18-22, 2010, R2-100472, Valencia, Spain.
	7	Huawei, "Different Timing Advance Impact on Carrier Aggregation", 3GPP TSG RAN WG2 meeting#67bis, October 12-16, 2009, R2-095815, Miyazaki, Japan.
	8	CATT, "L3 Anchor Carrier", 3GPP TSG-RAN WG2 Meeting #67, R2-094322, August 24-28, 2009, 2 pages, Shenzhen, China.
	9	Nokia Corporation, Nokia Siemens Networks, "RACH and carrier aggregation", 3GPP TSG-RAN WG2 Meeting #67bis, 2009.10.12-16, 3 pages, Miyazaki, Japan.
	10	Office Action issued by JPO on June 13, 2017 for the corresponding JP Application No. 2015-154385
	11	Office Action issued by KIPO on 12/21/2016 for the corresponding KR Application No. 10-2011-0008683.
	12	Nokia Corporation et al, 3GPP TSG-RAN WG2 Meeting #67bis, R2-095898, "RACH and carrier aggregation", Miyazaki, Japan dated October 12th- 16th, 2009.
	13	Office Action issued by Chinese Patent Office on 11/04/2019 for the corresponding CN Application No. 201610908740.4

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/LAN-HUONG TRUONG/	Date Considered	08/28/2020

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /L.T/

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Art Unit	2462
Examiner Name	MESFIN, YEMANE
Attorney Docket Number	GP.009C2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Seong Jun PARK/	Date (YYYY-MM-DD)	2020-04-27
Name/Print	Seong Jun PARK	Registration Number	73,534

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /L.T/

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 record s.

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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /L.T/

IPR2023-01269
Pantech Wireless, LLC Ex. 2021

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	37	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/12 00:10
S2	12	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/12 00:10
S3	6	("20080273610" | "20090186613" | "20090279495").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:16
S4	8	("20090274120" | "20100041399" | "20100111005").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:24
S5	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	2014/01/12 00:32
S6	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	2014/01/12 00:33
S7	3,922	(370/350).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:38
S8	21,823	(370/329).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	OFF	2014/01/12 00:38

			JPO; DERWENT; IBM_TDB			
S9	2,840	(370/330).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:38
S10	2,474	(370/337).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:39
S11	2,290	(370/345).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:39
S12	3,023	(370/347).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:39
S13	4	("20090005058").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:44
S14	3	("20090116434").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:45
S15	42	("2009/0116434").URPN.	USPAT	OR	ON	2014/01/12 00:48
S16	2	(transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR7 (information	US-PGPUB; USPAT;	OR	ON	2014/01/12 00:51

		OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH delegat$3 NEAR3 (CC OR (component adj carrier))	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S17	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	2014/01/12 00:52
S18	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	2014/01/12 00:52
S19	8	delegat$3 NEAR CC	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:53
S20	2	delegat$3 NEAR (component adj carrier)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:54
S21	74	S5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:56
S22	1	S5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.) AND delegate	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:57
S23	13	set$4 WITH (CC OR (component adj carrier)) NEAR9 aggregation NEAR4 information	US-PGPUB; USPAT	OR	ON	2014/01/12 09:39

S24	2	("20120021756" | "20120057490").PN.	US-PGPUB; USPAT	OR	ON	2014/01/12 09:42
S27	2	("20110267957").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 09:49
S28	3	("20090092091").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 09:50
S30	7	("2010148532").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 10:06
S31	9,068	(UL OR uplink) WITH (sync OR synchronization)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:52
S32	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	2014/01/12 11:53
S33	2	("2010/0331003").URPN.	USPAT	OR	ON	2014/01/12 11:57
S35	2	("20090316642").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 12:13
S37	20	("20030096631" | "20100331003" | "20060166688" | "20070072600" |	US-PGPUB; USPAT; USOCR;	OR	ON	2014/01/12 12:23

		"7054298" | "20040077357" | "20090186613").PN.	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S38	7	("2006/0166688").URPN.	USPAT	OR	ON	2014/01/12 12:46
S46	2	("20090239583").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/13 13:58
S47	21	("20070133611" | "20120057525" | "20050099986" | "20030125073" | "20120135715" | "20090239582" | "20090239583" | "20120004013").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/13 14:00
S50	3	("20100080155").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/13 14:19
S51	11	("2010/0182992").URPN.	USPAT	OR	ON	2014/01/13 14:25
S52	2	"US 20130034087"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2014/01/13 14:38
S53	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	2014/01/14 11:41
S54	3,925	(370/350).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/14 11:46
S55	20	S53 and S54	US-PGPUB; USPAT;	OR	ON	2014/01/14 11:48

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S56	5	S53 and S54 and (CC OR (component adj carrier))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 13:43
S57	15	("20080060249" | "20080305822" | "20070230394" | "20080119979" | "20070000967" | "20070254656").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 13:46
S58	2	"delegate component carrier"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 15:19
S60	5	"delegate CC"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 15:20
S61	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	2014/01/14 15:38
S62	276	set$4 WITH (CC OR (component adj carrier)) WITH characteristic	US-PGPUB; USPAT	OR	ON	2014/01/15 09:34
S63	1	set$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH UL NEAR3 synchronization	US-PGPUB; USPAT	OR	ON	2014/01/15 09:35
S64	4	set$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH synchronization	US-PGPUB; USPAT	OR	ON	2014/01/15 09:35

S66	31	set$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH state	US-PGPUB; USPAT	OR	ON	2014/01/15 09:36
S67	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	2014/01/15 09:38
S68	1,007	(370/324).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/15 09:39
S69	0	S62 and S68	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 09:40
S70	21,847	(370/329).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/15 09:40
S71	10	S62 and S70	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 09:40
S72	3	("2011/0292887").URPN.	USPAT	OR	ON	2014/01/15 09:51
S73	3	("2011/0292887").URPN.	USPAT	OR	ON	2014/01/15 09:56
S74	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	2014/01/15 10:04
S75	2	("2012/0063425").URPN.	USPAT	OR	ON	2014/01/15 10:04
S76	2	("13556165").PN.	US-PGPUB; USPAT;	OR	OFF	2014/01/15 10:16

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S78	13,343	retransmission near data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 10:56
S80	357	retransmission near data WITH receiv$3 NEAR4 terminals	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 11:00
S81	21	retransmission near data WITH receiv$3 NEAR4 terminals WITH threshold	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 11:00
S83	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	2014/01/15 19:59
S86	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	2014/01/15 21:58
S87	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	2014/01/15 22:00
S88	1,308	form$3 WITH timing near synchronization	US-PGPUB; USPAT; USOCR;	OR	ON	2014/01/16 10:13

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S89	13	form$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/16 10:14
S90	4	(transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing NEAR20 (simultaneously OR concurrently)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/16 11:03
S91	4	("2008/0037502").URPN.	USPAT	OR	ON	2014/01/16 11:12
S94	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" | "8031662").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/02/15 17:19
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S96	0	("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 stimutaneous	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/02/15 17:20
S97	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	2014/02/15 17:20
S98	4	("20110299489" | "20120113941" | "20120300743" | "20120076103" |	US-PGPUB; USPAT;	OR	ON	2014/02/15 17:21

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S99	44	("2007/0293224").URPN.	USPAT	OR	ON	2014/02/15 17:23
S100	17	("2012/0250520").URPN.	USPAT	OR	ON	2014/02/15 21:09
S101	17	("2012/0250520").URPN.	USPAT	OR	ON	2014/02/15 21:13
S102	13	("20100158147" | "20110038271" | "20110243016" | "20100273515" | "20090163211" | "20090163211" | "20090318180").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/02/15 21:41
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S106	44	("2007/0293224").URPN.	USPAT	OR	ON	2014/02/15 23:15
S107	15,703	H04W72/04.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:47
S108	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	2014/05/19 13:47
S109	6,136	H04W72/00.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:48
S111	1,564	H04B7/216.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:48
S112	7	S107 and S108	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:48
S114	3	S109 and S108	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2014/05/19 13:49

			DERWENT; IBM_TDB			
S115	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	2014/05/19 13:52
S116	2	("20120307821").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/06/27 23:56
S117	1	("20120307821").PN.	DERWENT	OR	OFF	2014/06/27 23:56
S118	3	("20130121264").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/06/28 22:01
S119	31,095	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:29
S120	31,048	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:30
S121	885	(H04B1/7087).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:31
S122	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;	OR	ON	2014/06/29 00:31

			DERWENT; IBM_TDB			
S123	53	S119 and S122	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:31
S124	19	S120 and S122	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:32
S125	2	S121 and S122	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:32
S126	2	("20090186613").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/06/29 01:17
S127	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	2014/06/29 09:56
S128	9	("20030076812" | "20090161599" | "20090290555" | "20090316642").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 10:03
S129	31,136	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2014/06/29 12:22

			DERWENT; IBM_TDB			
S130	12	(UL OR uplink) NEAR4 timing WITH distinguished and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 12:28
S131	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	2014/06/29 12:32
S132	15	S129 and S131	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 12:33
S133	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	2014/12/07 22:46
S134	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	2014/12/07 23:05
S135	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	2014/12/07 23:09
S136	19	("2010/0142485").URPN.	USPAT	OR	ON	2014/12/07 23:15

S137	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	2014/12/16 11:47
S138	75	(transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) WITH contention	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/16 11:49
S139	51	(component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/13 11:31
S140	47	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2015/01/13 12:46
S141	1	("2012/0108254").URPN.	USPAT	OR	ON	2015/01/13 13:26
S142	14	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:28
S162	41	("20090116434" | "20090274120" | "8606336" | "20110170495" | "20090318175" | "20100086065" | "20100238857" | "20100323744" | "20100041399" | "20090270094" | "20090316642" | "20100111005" | "20100118720").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/13 13:51
S177	2,316	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/12 11:59
S178	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	2016/12/12 12:04

S179	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	2016/12/12 12:05
S180	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	2016/12/12 12:05
S181	185	(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)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/12 12:06
S182	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	2016/12/12 12:07
S183	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	2016/12/12 12:08
S184	9	("20030076812" | "20090161599" | "20090290555" | "20090316642").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/12 12:17
S185	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	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2016/12/12 15:08

		(commponent ADJ carrier) OR (carrier ADJ frequency))	DERWENT; IBM_TDB			
S186	50	("2012/0307811").URPN.	USPAT	OR	ON	2016/12/12 15:18
S187	17	("20070189205" | "20100227569" | "20110261776" | "20110268032" | "20110299489" | "20120113941" | "20120300743" | "20120307811").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/14 16:27
S188	3	("8982805").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/14 16:47
S189	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	2016/12/14 17:02
S190	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 (commponent ADJ carrier) OR (carrier ADJ frequency))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/16 11:58
S191	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 (commponent ADJ carrier) OR (carrier ADJ frequency))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/16 11:58
S192	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 (commponent ADJ carrier) OR (carrier ADJ frequency)) and (@pd OR @ptad OR	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/16 11:58

		@prad OR @ad OR @rlad)<"20100210"				
S193	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	2016/12/19 11:36
S194	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	2016/12/19 11:36
S195	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	2016/12/19 11:37
S196	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	2016/12/19 11:37
S197	196	(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 NEAR2 (UL OR uplink)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 11:38
S198	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	2016/12/19 11:38
S199	17	("20080002660" | "20140293853" | "20140073337" | "20160100374" | "20080279131" | "20130116002").PN.	US-PGPUB; USPAT; USOCR;	OR	ON	2016/12/19 11:39

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S200	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	2016/12/19 12:11
S201	10	("20100238908" | "20110243111" | "20120063425" | "20120099577").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 12:13
S202	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	2016/12/19 13:18
S203	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 estimat$3) WITH timing NEAR2 advanc$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 13:19
S204	2,533	(H04J3/00).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 15:12
S205	2	("20150271770").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/12/20 09:10
S206	56	delegat$3 NEAR2 (carrier OR CC OR CCs)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/24 11:59

S207	26	delegat$3 NEAR2 (carrier OR CC OR CCs) AND synchronization	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/24 12:00
S208	6	("20080273610" | "20090186613" | "20090279495").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/24 12:09
S209	3	("20100118720").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/24 12:20
S210	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	2016/12/24 14:16
S211	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	2016/12/25 00:02
S212	8,428	(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	2016/12/25 00:03
S213	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 @rlad)<"20100212"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/25 00:04
S214	10	(calculat$3 OR comput$4 OR estimat$4) SAME (TA OR timing ADJ	US-PGPUB; USPAT;	OR	ON	2016/12/25 00:05

		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"	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S215	2	("20100222059").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/26 02:02
S216	34	("2010/0222059").URPN.	USPAT	OR	ON	2016/12/26 02:06
S217	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	2016/12/26 13:11
S218	2	("20100142485").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/26 15:28
S219	0	WO2009079913	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/26 23:16
S220	5	"2009079913"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/26 23:16
S221	64	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2017/04/20 09:54
S222	21	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2017/04/20 09:54
S232	61	("20090116434" | "20090274120" | "20100177747" | "20090270094" | "20100041399" | "20100118720" | "20080002660" | "20080188219" | "20100142485" | "20090316642" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2017/08/18 16:08

		"20090318175" | "20100238857" | "8606336" | "20100111005" | "20100323744" | "20100238872" | "20120008600" | "20090279495" | "20100086065" | "20110170495" | "20080268850").PN.	DERWENT; IBM_TDB			
S233	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	2018/11/09 18:26
S234	2,976	(H04J3/00).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/09 22:30
S235	5	("9854545").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2018/11/09 23:14
S236	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	2018/11/09 23:47
S237	4,191	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/09 23:48
S238	1	S234 AND S237	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/09 23:50
S239	3	("9054835").PN.	US-PGPUB; USPAT; USOCR;	OR	OFF	2018/11/09 23:52

			FPRS; JPO; DERWENT			
S240	3	("9054835").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/06/05 07:05
S241	41	("20090116434" | "20090274120" | "8606336" | "20110170495" | "20090318175" | "20100086065" | "20100238857" | "20100323744" | "20100041399" | "20090270094" | "20090316642" | "20100111005" | "20100118720").PN.	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/06/05 08:36
S242	3,121	(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	2019/06/05 08:38
S243	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	2019/06/05 08:45
S244	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	2019/06/05 08:46
S245	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	2019/06/26 08:22
S246	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	2019/06/26 08:30

S247	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	2019/06/26 08:32
S248	7,568	timing NEAR2 groups AND @ad<"20100210"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/06/26 08:39
S249	17	timing NEAR2 advanced SAME tim$3 NEAR2 groups AND @ad<"20100210"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/06/26 08:40
S250	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	2019/06/27 23:44
S251	6	(forward$3 OR transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR5 (information OR message OR data) SAME (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	2019/07/09 12:20
S252	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	2019/07/09 12:35
S253	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	2019/07/09 14:55

S254	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	2019/07/09 15:26
S255	77	("2013/0250925").URPN.	USPAT	OR	ON	2019/07/09 15:29
S256	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	2019/07/09 16:58
S257	4	("20120008600").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/09 17:34
S258	16,731	carrier ADJ2 aggregation AND timing	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:39
S259	505	RACH SAME carrier ADJ2 aggregation AND timing	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:40
S260	0	RACH NEAR3 respons3 SAME carrier ADJ2 aggregation AND timing	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:40
S261	141	RACH SAME carrier ADJ2 aggregation AND timing NEAR2 groups	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:41
S262	141	RACH SAME (CC1 CCs CC2 carriers) ADJ2 aggregation AND timing NEAR2 groups	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:41
S263	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	2019/07/09 17:42
S264	292	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 carriers) ADJ2	US-PGPUB; USPAT;	OR	ON	2019/07/09 17:43

		aggregation SAME timing NEAR2 groups	FPRS; EPO; DERWENT			
S265	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	2019/07/09 17:43
S266	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	2019/07/09 17:44
S267	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	2019/07/09 17:44
S268	205	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:45
S269	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	2019/07/09 17:46
S270	13	("20110243111" | "20110243102" | "20120099577" | "20120250520" | "20120300715" | "20120294272" | "20110243102").PN.	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:50
S271	2	("20120300715").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/09 18:12
S272	74	("2012/0300715").URPN.	USPAT	OR	ON	2019/07/09 18:12
S273	3	delegat$3 SAME (component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/23 13:56
S274	6	("20080273610" | "20090186613" | "20090279495").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2019/07/23 14:33

			JPO; DERWENT; IBM_TDB			
S275	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	2019/07/23 23:46
S276	0	(TA OR tim$4 NEAR2 advanced) SAME tim$3 NEAR2 groups AND (UL uplink) NEAR2 (CC CC1 CC2 CCs) AND @ad<"20100210"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/23 23:48
S277	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	2019/07/23 23:48
S278	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	2019/07/23 23:49
S279	2	("20080267165").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 08:45
S280	4	("20120008600").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 23:49
S281	3	("9054835").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 23:52
S282	5	("9854545").PN.	US-PGPUB; USPAT; USOCR;	OR	OFF	2019/07/24 23:59

			FPRS; JPO; DERWENT			
S283	60	timing AND (component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 14:40
S284	67	timing AND (component NEAR carrier AND (primary NEAR2 CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 14:40
S285	2,491	timing AND (component NEAR carrier AND (primary NEAR2 CC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 14:49
S286	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	2019/07/26 14:49
S287	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	2019/07/26 14:49
S288	12,348	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	2019/07/26 14:51
S291	109	updat$3 NEAR2 timing NEAR2 group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2019/07/26 15:04

			DERWENT; IBM_TDB			
S292	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	2019/07/26 15:05
S293	2	("20200145949").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2020/08/26 21:41
S294	152,373	(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	2020/08/26 22:12
S295	108,349	(H04L5/001 or H04L5/0007).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/26 22:12
S296	1,453	(H04B1/7087).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/26 22:12
S297	80	((("KWON") near3 ("Kibum"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/08/26 22:13
S298	28	((("JUNG") near3 ("Myungcheul"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/08/26 22:13
S299	3,343	timing AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/27 12:05

S300	3,491	(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	2020/08/27 12:05
S301	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	2020/08/27 12:05
S302	55	("20080232316" | "20110013581" | "20050053029" | "8125948" | "20110075629" | "20110098074" | "20100240372" | "20110003555" | "20110261714" | "7782899" | "20050053029" | "20080212556" | "20110122794" | "20120147830" | "20110268032" | "20060034204" | "20080232316" | "20100130218" | "20110142009" | "20110235609" | "20100302964" | "20100227569" | "20100285809" | "20120218987").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/27 12:26
S303	3	("20120099577").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2020/08/27 12:35
S304	11	("2012/0099577").URPN.	USPAT	OR	ON	2020/08/27 12:41
S305	10	("20100238908" | "20110243111" | "20120063425" | "20120099577").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/27 14:02

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S143	3,665	(370/350).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/01/13 11:08

S144	51	(component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:31
S145	7	uplink NEAR timing NEAR group.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:31
S146	22	UL NEAR group.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:31
S147	83	synchronization NEAR request NEAR message.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:32
S148	9	S143 AND S147	US-PGPUB; USPAT	OR	ON	2015/01/13 11:34
S149	2	S146 AND S147	US-PGPUB; USPAT	OR	ON	2015/01/13 11:36
S150	1	S144 AND S147	US-PGPUB; USPAT	OR	ON	2015/01/13 11:36
S151	5,348	uplink AND synchronization.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:37
S152	646	S143 AND S151	US-PGPUB; USPAT	OR	ON	2015/01/13 11:40
S153	1	S146 AND S152	US-PGPUB; USPAT	OR	ON	2015/01/13 11:40
S154	1	S147 AND S152	US-PGPUB; USPAT	OR	ON	2015/01/13 11:40
S155	3	UL NEAR timing NEAR group.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:42
S156	15	(component NEAR carrier AND (primary NEAR CC) AND (second NEAR CC)).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:44
S157	3	delegate ADJ CC.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:32
S158	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:32

S159	1	S147 AND S158	US-PGPUB; USPAT	OR	ON	2015/01/13 13:33
S160	10	S144 AND S158	US-PGPUB; USPAT	OR	ON	2015/01/13 13:33
S161	64	(primary ADJ CC) AND (radio NEAR resource NEAR control) AND timing.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:34
S163	8,801	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:00
S164	213	(H04B1/7087).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:00
S165	8,686	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:00
S166	3,665	(370/350).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/01/13 15:01
S167	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:01
S168	7	S163 AND S167	US-PGPUB; USPAT	OR	ON	2015/01/13 15:01
S169	86	S167 AND S167	US-PGPUB; USPAT	OR	ON	2015/01/13 15:01
S170	56	S165 AND S167	US-PGPUB; USPAT	OR	ON	2015/01/13 15:02
S171	5,348	uplink AND synchronization.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:04
S172	431	S163 AND S171	US-PGPUB; USPAT	OR	ON	2015/01/13 15:04
S173	3	S167 AND S172	US-PGPUB; USPAT	OR	ON	2015/01/13 15:04
S174	8,686	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:31

S175	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:32
S176	56	S174 AND S175	US-PGPUB; USPAT	OR	ON	2015/01/13 15:32
S223	15,660	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT	OR	ON	2017/04/20 10:49
S224	275	uplink AND timing NEAR advance NEAR value.clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 10:50
S225	12	uplink AND timing NEAR advance NEAR value AND RAR.clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 10:50
S226	5	uplink NEAR timing AND TA NEAR value AND RAR.clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 11:02
S227	93	(component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 11:20
S228	236	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 11:20
S229	0	S223 AND S224 AND S228	US-PGPUB; USPAT	OR	ON	2017/04/20 11:20
S230	21	S223 AND S224	US-PGPUB; USPAT	OR	ON	2017/04/20 11:21
S231	3	S224 AND S228	US-PGPUB; USPAT	OR	ON	2017/04/20 11:21

8/28/2020 5:19:17 PM
C:\Users\ltruong1\Documents\EAST\Workspaces\16-733106_CON15-820980.wsp

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 OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	16733106
Filing Date	02-Jan-2020
First Named Inventor	Kibum KWON
Attorney Docket Number	PPA0010US
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)

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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.

○ 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 73663 ○ 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	/Yeasun Yoon, Reg.# 73663/
Name	Yeasun 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:	16733106
Filing Date:	02-Jan-2020
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:	PPA0010US

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:				

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.: 16733106

Filing Date: 02-Jan-2020

Applicant/Patent under Reexamination: KWON

Electronic Terminal Disclaimer filed on December 2, 2020

☒ 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:	41275112
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
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:	PPA0010US
Receipt Date:	02-DEC-2020
Filing Date:	02-JAN-2020
Time Stamp:	15:25:11
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	E2020B2F25077167
Deposit Account	
Authorized User	

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

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	33683 32bad5a1e8b1623144233f85491b4ed60d15c2bd	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30429 a76e00f3f99d9177998538e88c98f6164c81d380	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	64112		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner: TRUONG, LAN-HUONG
Kibum KWON *et al.*	Group Art Unit: 2464
Application No.: 16/733,106	Confirmation No.: 6857
Filing Date: January 02, 2020	Attorney Docket No.: PPA0010US

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 2, 2020 ("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).

Applicant submits a fee in the amount of $480 for the addition of one independent claims. Any fees required for extensions of time or for the net addition of claims may be charged to our Deposit Account No. 603320.

Electronic Patent Application Fee Transmittal

Application Number:	16733106
Filing Date:	02-Jan-2020
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:	PPA0010US

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:				
INDEPENDENT CLAIMS IN EXCESS OF 3	1201	1	480	480
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

Electronic Acknowledgement Receipt

EFS ID:	41275603
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
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:	PPA0010US
Receipt Date:	02-DEC-2020
Filing Date:	02-JAN-2020
Time Stamp:	15:40:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$480
RAM confirmation Number	E2020B2F40147523
Deposit Account	
Authorized User	

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		PPA0010US-NFOAReply_.pdf	3586152 bafe1760a2b955e400e9389bc1df8dd962c9551b	yes	16

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Applicant Arguments/Remarks Made in an Amendment	11	16
	Claims	2	10
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30677 75d72f31a338aace99d5ae5d59612639fdc2d1f9	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	3616829	

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.

REMARKS

Claims 1 and 2 have been amended and claims 3-20 have been added. Accordingly, claims 1-20 are currently pending in the Application, of which claims 1, 2, 11, and 16 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.

Rejection of Claims under Double Patenting

Claims 1 and 2 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U. S. Patent No. 9,054,835.

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.

Rejections Under 35 U.S.C. § 103

To establish an obviousness rejection under 35 U.S.C. § 103(a), four factual inquires

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must be examined. The four factual inquires include (a) determining the scope and contents of the prior art; (b) ascertaining the differences between the prior art and the claims in issue; (c) resolving the level of ordinary skill in the pertinent art; and (d) evaluating evidence of secondary consideration. Graham v. John Deere, 383 U.S. 1, 17-18 (1966).

In view of these four factors, the analysis supporting a rejection under 35 U.S.C. § 103(a) should be made explicit, and should "identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. KSR Int'l. Co. v. Teleflex, Inc., 127 S. Ct. 1727, 82 USPQ2d 1385, 1396(2007). The Federal Circuit requires that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977,988,78 USPQ2d 1329, 1336(Fed. Cir. 2006).

Finally, even if the prior art may be combined, there must be a reasonable expectation of success, and the reference or references, when combined, must disclose, or suggest every claimed feature. See In re Vaeck, 947 F.2d 488,20 USPQ2d 1438(Fed. Cir. 1991).

Claims 1 and 2 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Yoo (Pub. No. U.S. 2009/0279495 A1; hereinafter "Yoo") in view of Marinier et al. (U.S. 2012/0008600) further in view of ZTE, "Impact analysis of multiple TA", (3GPP TSG RAN WG2#68bis, R2-100308, Valencia, Spain, January 2010; hereinafter "Valencia.")

Without conceding to the correctness of the Examiner's assertions, independent claim 1and 2 have been amended.

Claim 1 recites, inter alia:

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transmitting, at 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;

receiving, at the UE, a random access response through the primary CC**, the random access response includes a Timing Advanced (TA) value for the secondary CC for the respective second UL timing group, 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.(emphasis added)

In rejecting claim 1, the Office Action acknowledges that Yoo does not disclose "wherein the primary CC belongs to a first timing group, the RRC message comprises information related to a second timing group, the second timing group includes a secondary CC," as recited in claim 1, and allegs that Marinier and Valencia teach such features (See Office Action, page 6). Applicants respectfully disagree.

Marinier discloses that 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 performs 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.

As such, Marinier teaches that the WTRU may be configured to receive a Time Advance (TA) value and apply TA value to each of the one or more uplink carriers that comprise the selected UL CC. However, Marinier fails to disclose or teach at least "the RRC message

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comprises information related to a second UL timing group", "the second UL timing group includes a secondary CC", and "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," as recited in claim 1.

Further, Valencia discloses PRACH resources may be available on multiple UL CCs for carrier aggregation and UE try to receive random access response after it transmitted preamble and UL synchronization for the first configured/activated CC in a CC group (see Valencia, section 3.1, 3.2 and conclusion).

As such, Valencia teaches that UE receive random access response after it transmitted preamble and UL synchronization for the first configured/activated CC in a CC group.

However, Valencia still fails to disclose or teach at least "the RRC message comprises information related to a second UL timing group", "the second UL timing group includes a secondary CC", and "the random access response includes a Timing Advanced (TA) value for the secondary CC for the respective second UL timing group, 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" as recited claim 1.

Therefore, Marinier – Valencia combination fails to disclose the RRC message comprises information related to a second UL timing group", "the second UL timing group includes a secondary CC", and "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 " as recited claim 1.

Accordingly, for at least the reasons noted above, the office action fails to establish a

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prima facie case of obviousness of claim 1 at least because even if combined, Yoo in view of Marinier and Valencia fail to disclose or suggest every claimed feature.

Independent claim 2 includes similar features as recited above with respect to claim 1 and should be deemed allowable for similar reason.

Accordingly Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claims 1 and 2. Since none of the alleged prior art of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed subject matter, Applicants respectfully submit that independent claims 1 and 2 are allowable.

Added New Claims

Added claims 3-20 are directed to additional features [aspects] of the invention, which are not disclosed or suggested in the art of record. As each of these claims reflects the features discussed above, these claims are allowable for reasons similar to claims 1 and 2.

Specifically, independent claims 11and 16 include similar features as recited above with respect to claims 1 and 2 should be deemed allowable for similar reason.

Claims 3-6 depend from claim 1, claims 7-10 depend from claim 2, claims 12-15 depend from claim 11, and claims 17-20 depend from claim 16, respectively, and are allowable at least for the following reason. since none of the alleged prior art of record, whether taken alone or in any combination, discloses or suggests all the features of the claimed subject matter, Applicants respectfully submit that independent claims 1, 2, 11 and 16 and all the claims that depend therefrom, are allowable.

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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,

/Yeasun Yoon, Reg.# 73663/

Yeasun Yoon
Reg. No. 73,663

Date: December 2, 2020

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AMENDMENTS TO THE CLAIMS / CLAIM LIST

Please **AMEND** claims 1 and 2 shown below.

Pleas **ADD** new claims 3-20 as 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 ~~a~~ the ~~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, 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 ~~the secondary CC~~ 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; ~~and~~

receiving, at the UE, a random access response through the primary CC, the random access response includes a Timing Advanced (TA) value for the secondary CC for the respective second UL timing group,

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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. (Currently Amended) 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; ~~and~~

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 ~~the secondary CC~~ 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 receive a random access response through the primary CC,

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the random access response includes a Timing Advanced(TA) value for the secondary CC for the respective second UL timing group,

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.

3. (New) 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.

4. (New) 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.

5. (New) The method of claim 1, further comprising:

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receiving the 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 through the random access response from the eNB.

6. (New) 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.

7. (New) The UE of claim 2, 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.

8. (New) The UE of claim 2, 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

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group, from among a plurality of CCs; and the second UL timing group is generated by the UE or the eNB.

9. (New) The UE of claim 2, further comprising:

the processor is configured to cause the apparatus to receive the 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 the UL grant information through the random access response from the eNB.

10. (New) The UE of claim 2, 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.

11. (New) 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;

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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 for a secondary CC for the respective second UL timing group,

wherein each TA value is calculated by 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.

12. (New) The method of claim 11, 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.

13. (New) The method of claim 11, 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

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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.

14. (New) The method of claim 11, further comprising:

calculating the TA value that is calculated to adjust a UL transmission time for the second UL timing group in response to the received the random access preamble; and

transmitting, to the UE, the calculated TA value together with UL grant information for the UE through the random access response.

15. (New) The method of claim 11, 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.

16. (New) 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:

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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 for the secondary CC for the respective second UL timing group,

wherein each TA value is calculated by 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.

17. (New) The eNB of claim 16, 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

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(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.

18. (New) The eNB of claim 16, 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.

19. (New) The eNB of claim 16, further comprising:

the process is configured to cause the apparatus to calculate the TA value to adjust a UL transmission time for the second UL timing group in response to the received the random access preamble; and cause to the apparatus to transmit, to the UE, the calculated TA value together with UL grant information for the UE through the random access response.

20. (New) The eNB of claim 16, 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.

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/733,106	Filing Date 01/02/2020	☐ To be Mailed

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 $460 =	
☐ 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)			
AMENDMENT	12/03/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 3	= 1		x $480 =	480
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	480

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	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".	/ZETA T ADAMS/
*** 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.**

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NOTICE OF ALLOWANCE AND FEE(S) DUE

167455 7590 01/14/2021

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

EXAMINER
TRUONG, LAN-HUONG

ART UNIT	PAPER NUMBER
2464	

DATE MAILED: 01/14/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/733,106	01/02/2020	Kibum KWON	PPA0010US	6857

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	04/14/2021

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 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity 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 and an extra copy of the form should be submitted. 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

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By mail, send to: Mail Stop ISSUE FEE
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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.

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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.

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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.
16/733,106	01/02/2020	Kibum KWON	PPA0010US	6857

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	04/14/2021

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/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 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 _____

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❑ 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. _____

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Pantech Wireless, LLC Ex. 2021
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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/733,106	01/02/2020	Kibum KWON	PPA0010US	6857

167455 7590 01/14/2021

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

EXAMINER	
TRUONG, LAN-HUONG	
ART UNIT	PAPER NUMBER
2464	

DATE MAILED: 01/14/2021

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. 16/733,106	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 12/02/2020.
   ☐ 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 1-20 . 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. _____ .
   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)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/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 application filed on 12/02/2020. Claims 1 and 2 have been amended. New claims 3-20 are added.

Response to arguments

3. An Electronic Terminal Disclaimer filed on 12/02/2020 has been recorded and approved 12/02/2020. Therefore the double patenting rejection is withdrawn. Arguments are persuasive and the previous rejection is withdrawn.

Allowable Subject Matter

Claims 1-20 are allowed.

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

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

Regarding in claims 1, 2, 11 and 16, Yoo discloses BS transmits arandom access response message to the UE and upon receipt of the RRC signaling the BS transmits RRC signaling for uplink transmission from its RRC layer to the RRC layer of the UE and uplink time alignment between the UE and BS, a random access procedure is performed via a random access preamble and the BS transmits a random access response message to the UE.

Marinier, 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.

Valencia, discloses PRACH resources may be available on multiple UL CCs for carrier aggregation and UE try to receive RAR after it transmitted preamble and UL synchronization for the first configured/activated CC in a CC group.

However, none of Yo, Marinier, Valencia and other prior arts teaches or suggests, alone or in combination, the particular combination of claimed features relating to *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 for a secondary CC for the respective second UL timing group, wherein each TA value is calculated by 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.*

Above taken with other limitations of the claims is considered novel and non-obvious.

Claims 3-6, 7-10, 12-15 and 17-20 depend from claims 1, 2, 11 and 16 are allowed since they depend from allowable claims 1, 2, 11 and 16.

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
12/18/2020

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	**Art Unit**
	LAN-HUONG TRUONG	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**	**Ranking**	**Version**
	/		/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/LAN-HUONG TRUONG/ Primary Examiner, Art Unit 2464	18 December 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	Claim 1	Figure 5

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	**Art Unit**
	LAN-HUONG TRUONG	2464

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04W	/	72	/	04

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/LAN-HUONG TRUONG/ Primary Examiner, Art Unit 2464	18 December 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	Claim 1	Figure 5

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	**Art Unit**
	LAN-HUONG TRUONG	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	1	10	10	19	19										
6	2	11	11	20	20										
2	3	12	12												
3	4	13	13												
4	5	14	14												
5	6	15	15												
7	7	16	16												
8	8	17	17												
9	9	18	18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/LAN-HUONG TRUONG/ Primary Examiner, Art Unit 2464	18 December 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	Claim 1	Figure 5

U.S. Patent and Trademark Office Part of Paper No.: 20201216

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/733,106	KWON et al.
	Examiner	Art Unit
	LAN-HUONG TRUONG	2464

CPC - Searched*		
Symbol	Date	Examiner
H04W56/0005; H04W76/27; H04W74/004; H04W56/0045; H04W88/08; H04W92/10; H04W56/0015; H04W74/08	08/26/2020	LT
H04L5/001; H04L5/0007	08/26/2020	LT
H04B1/7087	08/26/2020	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	08/26/2020	LT
East searching performed	08/26/2020	LT
IEEE, 3GPP and IP searching performed	08/26/2020	LT
CPC and East search updated	12/16/2020	LT
Internet Google Patent search	08/26/2020	LT
Double Patenting searching performed	08/26/2020	LT

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
US-PGPUB, UPAT	Database Interference Search	12/16/2020	LT
H04W74/08	H04W88/08; H04W92/10; H04W56/0015	12/16/2020	LT
H04B1/7087		12/16/2020	LT

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	Examiner	Art Unit
	LAN-HUONG TRUONG	2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	08/26/2020	12/16/2020							
1	1	✓	=							
6	2	✓	=							
2	3		=							
3	4		=							
4	5		=							
5	6		=							
7	7		=							
8	8		=							
9	9		=							
10	10		=							
11	11		=							
12	12		=							
13	13		=							
14	14		=							
15	15		=							
16	16		=							
17	17		=							
18	18		=							
19	19		=							
20	20		=							

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	37	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/12 00:10
S2	12	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/12 00:10
S3	6	("20080273610" | "20090186613" | "20090279495").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:16
S4	8	("20090274120" | "20100041399" | "20100111005").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:24
S5	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	2014/01/12 00:32
S6	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	2014/01/12 00:33
S7	3,922	(370/350).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:38
S8	21,823	(370/329).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	OFF	2014/01/12 00:38

			JPO; DERWENT; IBM_TDB			
S9	2,840	(370/330).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:38
S10	2,474	(370/337).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:39
S11	2,290	(370/345).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:39
S12	3,023	(370/347).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:39
S13	4	("20090005058").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:44
S14	3	("20090116434").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 00:45
S15	42	("2009/0116434").URPN.	USPAT	OR	ON	2014/01/12 00:48
S16	2	(transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR7 (information	US-PGPUB; USPAT;	OR	ON	2014/01/12 00:51

		OR message OR data) WITH (UL OR uplink) NEAR4 timing WITH delegat$3 NEAR3 (CC OR (component adj carrier))	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S17	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	2014/01/12 00:52
S18	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	2014/01/12 00:52
S19	8	delegat$3 NEAR CC	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:53
S20	2	delegat$3 NEAR (component adj carrier)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:54
S21	74	S5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:56
S22	1	S5 AND ((H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.) AND delegate	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 00:57
S23	13	set$4 WITH (CC OR (component adj carrier)) NEAR9 aggregation NEAR4 information	US-PGPUB; USPAT	OR	ON	2014/01/12 09:39

S24	2	("20120021756" | "20120057490").PN.	US-PGPUB; USPAT	OR	ON	2014/01/12 09:42
S27	2	("20110267957").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 09:49
S28	3	("20090092091").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 09:50
S30	7	("2010148532").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 10:06
S31	9,068	(UL OR uplink) WITH (sync OR synchronization)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/12 11:52
S32	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	2014/01/12 11:53
S33	2	("2010/0331003").URPN.	USPAT	OR	ON	2014/01/12 11:57
S35	2	("20090316642").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/12 12:13
S37	20	("20030096631" | "20100331003" | "20060166688" | "20070072600" |	US-PGPUB; USPAT; USOCR;	OR	ON	2014/01/12 12:23

		"7054298" | "20040077357" | "20090186613").PN.	FPRS; EPO; JPO; DERWENT; IBM_TDB			
S38	7	("2006/0166688").URPN.	USPAT	OR	ON	2014/01/12 12:46
S46	2	("20090239583").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/13 13:58
S47	21	("20070133611" | "20120057525" | "20050099986" | "20030125073" | "20120135715" | "20090239582" | "20090239583" | "20120004013").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/13 14:00
S50	3	("20100080155").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/13 14:19
S51	11	("2010/0182992").URPN.	USPAT	OR	ON	2014/01/13 14:25
S52	2	"US 20130034087"	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2014/01/13 14:38
S53	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	2014/01/14 11:41
S54	3,925	(370/350).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/14 11:46
S55	20	S53 and S54	US-PGPUB; USPAT;	OR	ON	2014/01/14 11:48

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S56	5	S53 and S54 and (CC OR (component adj carrier))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 13:43
S57	15	("20080060249" | "20080305822" | "20070230394" | "20080119979" | "20070000967" | "20070254656").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 13:46
S58	2	"delegate component carrier"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 15:19
S60	5	"delegate CC"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/14 15:20
S61	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	2014/01/14 15:38
S62	276	set$4 WITH (CC OR (component adj carrier)) WITH characteristic	US-PGPUB; USPAT	OR	ON	2014/01/15 09:34
S63	1	set$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH UL NEAR3 synchronization	US-PGPUB; USPAT	OR	ON	2014/01/15 09:35
S64	4	set$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH synchronization	US-PGPUB; USPAT	OR	ON	2014/01/15 09:35

S66	31	set$4 WITH (CC OR (component adj carrier)) WITH characteristic WITH state	US-PGPUB; USPAT	OR	ON	2014/01/15 09:36
S67	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	2014/01/15 09:38
S68	1,007	(370/324).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/15 09:39
S69	0	S62 and S68	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 09:40
S70	21,847	(370/329).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/01/15 09:40
S71	10	S62 and S70	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 09:40
S72	3	("2011/0292887").URPN.	USPAT	OR	ON	2014/01/15 09:51
S73	3	("2011/0292887").URPN.	USPAT	OR	ON	2014/01/15 09:56
S74	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	2014/01/15 10:04
S75	2	("2012/0063425").URPN.	USPAT	OR	ON	2014/01/15 10:04
S76	2	("13556165").PN.	US-PGPUB; USPAT;	OR	OFF	2014/01/15 10:16

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S78	13,343	retransmission near data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 10:56
S80	357	retransmission near data WITH receiv$3 NEAR4 terminals	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 11:00
S81	21	retransmission near data WITH receiv$3 NEAR4 terminals WITH threshold	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/15 11:00
S83	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	2014/01/15 19:59
S86	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	2014/01/15 21:58
S87	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	2014/01/15 22:00
S88	1,308	form$3 WITH timing near synchronization	US-PGPUB; USPAT; USOCR;	OR	ON	2014/01/16 10:13

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S89	13	form$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/16 10:14
S90	4	(transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) NEAR4 timing NEAR20 (simultaneously OR concurrently)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/01/16 11:03
S91	4	("2008/0037502").URPN.	USPAT	OR	ON	2014/01/16 11:12
S94	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" | "8031662").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/02/15 17:19
S95	62	("20110299489" | "20120113941" | "20120300743" | "20120076103" | "20130078913" | "20130094466" | "20110268032" | "20120113914" | "20120113962" | "20130094433" | "20120113962" | "20120250520" | "20120300743" | "20120224552" | "20130072246" | "20070189205" | "20110261776" | "20110268032" | "20120076103" | "20120008600" | "20120243498" | "20120250520" |	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/02/15 17:20

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S97	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	2014/02/15 17:20
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S99	44	("2007/0293224").URPN.	USPAT	OR	ON	2014/02/15 17:23
S100	17	("2012/0250520").URPN.	USPAT	OR	ON	2014/02/15 21:09
S101	17	("2012/0250520").URPN.	USPAT	OR	ON	2014/02/15 21:13
S102	13	("20100158147" | "20110038271" | "20110243016" | "20100273515" | "20090163211" | "20090163211" | "20090318180").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/02/15 21:41
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S105	11	("20080101268" | "20060067364" | "20050094670" | "20060209870" |	US-PGPUB; USPAT;	OR	ON	2014/02/15 22:54

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S106	44	("2007/0293224").URPN.	USPAT	OR	ON	2014/02/15 23:15
S107	15,703	H04W72/04.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:47

S108	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	2014/05/19 13:47
S109	6,136	H04W72/00.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:48
S111	1,564	H04B7/216.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:48
S112	7	S107 and S108	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:48
S114	3	S109 and S108	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/05/19 13:49
S115	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	2014/05/19 13:52
S116	2	("20120307821").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/06/27 23:56
S117	1	("20120307821").PN.	DERWENT	OR	OFF	2014/06/27 23:56

S118	3	("20130121264").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/06/28 22:01
S119	31,095	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:29
S120	31,048	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:30
S121	885	(H04B1/7087).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:31
S122	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	2014/06/29 00:31
S123	53	S119 and S122	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:31
S124	19	S120 and S122	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:32

S125	2	S121 and S122	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 00:32
S126	2	("20090186613").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2014/06/29 01:17
S127	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	2014/06/29 09:56
S128	9	("20030076812" | "20090161599" | "20090290555" | "20090316642").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 10:03
S129	31,136	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 12:22
S130	12	(UL OR uplink) NEAR4 timing WITH distinguished and (@pd OR @ptad OR @prad OR @ad OR @rlad)<"20100212"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 12:28
S131	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	2014/06/29 12:32

S132	15	S129 and S131	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/06/29 12:33
S133	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	2014/12/07 22:46
S134	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	2014/12/07 23:05
S135	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	2014/12/07 23:09
S136	19	("2010/0142485").URPN.	USPAT	OR	ON	2014/12/07 23:15
S137	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	2014/12/16 11:47
S138	75	(transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR7 (information OR message OR data) WITH (UL OR uplink) WITH contention	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2014/12/16 11:49
S139	51	(component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2015/01/13 11:31

			JPO; DERWENT; IBM_TDB			
S140	47	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2015/01/13 12:46
S141	1	("2012/0108254").URPN.	USPAT	OR	ON	2015/01/13 13:26
S142	14	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:28
S162	41	("20090116434" | "20090274120" | "8606336" | "20110170495" | "20090318175" | "20100086065" | "20100238857" | "20100323744" | "20100041399" | "20090270094" | "20090316642" | "20100111005" | "20100118720").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/01/13 13:51
S177	2,316	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/12 11:59
S178	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	2016/12/12 12:04
S179	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	2016/12/12 12:05
S180	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	2016/12/12 12:05
S181	185	(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)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2016/12/12 12:06

			DERWENT; IBM_TDB			
S182	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	2016/12/12 12:07
S183	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	2016/12/12 12:08
S184	9	("20030076812" | "20090161599" | "20090290555" | "20090316642").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/12 12:17
S185	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	2016/12/12 15:08
S186	50	("2012/0307811").URPN.	USPAT	OR	ON	2016/12/12 15:18
S187	17	("20070189205" | "20100227569" | "20110261776" | "20110268032" | "20110299489" | "20120113941" | "20120300743" | "20120307811").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/14 16:27
S188	3	("8982805").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/14 16:47

S189	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	2016/12/14 17:02
S190	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 (commponent ADJ carrier) OR (carrier ADJ frequency))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/16 11:58
S191	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 (commponent ADJ carrier) OR (carrier ADJ frequency))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/16 11:58
S192	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 (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	2016/12/16 11:58
S193	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	2016/12/19 11:36
S194	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	2016/12/19 11:36

S195	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	2016/12/19 11:37
S196	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	2016/12/19 11:37
S197	196	(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 NEAR2 (UL OR uplink)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 11:38
S198	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	2016/12/19 11:38
S199	17	("20080002660" | "20140293853" | "20140073337" | "20160100374" | "20080279131" | "20130116002").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 11:39
S200	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	2016/12/19 12:11
S201	10	("20100238908" | "20110243111" | "20120063425" | "20120099577").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 12:13

S202	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	2016/12/19 13:18
S203	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 estimat$3) WITH timing NEAR2 advanc$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 13:19
S204	2,533	(H04J3/00).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/19 15:12
S205	2	("20150271770").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2016/12/20 09:10
S206	56	delegat$3 NEAR2 (carrier OR CC OR CCs)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/24 11:59
S207	26	delegat$3 NEAR2 (carrier OR CC OR CCs) AND synchronization	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/24 12:00
S208	6	("20080273610" | "20090186613" | "20090279495").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/24 12:09
S209	3	("20100118720").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	OFF	2016/12/24 12:20

			JPO; DERWENT			
S210	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	2016/12/24 14:16
S211	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	2016/12/25 00:02
S212	8,428	(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	2016/12/25 00:03
S213	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 @rlad)<"20100212"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/25 00:04
S214	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	2016/12/25 00:05
S215	2	("20100222059").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/26 02:02
S216	34	("2010/0222059").URPN.	USPAT	OR	ON	2016/12/26 02:06
S217	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	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2016/12/26 13:11

		@prad OR @ad OR @rlad)<"20100212"	JPO; DERWENT; IBM_TDB			
S218	2	("20100142485").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2016/12/26 15:28
S219	0	WO2009079913	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/26 23:16
S220	5	"2009079913"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/26 23:16
S221	64	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2017/04/20 09:54
S222	21	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2017/04/20 09:54
S232	61	("20090116434" | "20090274120" | "20100177747" | "20090270094" | "20100041399" | "20100118720" | "20080002660" | "20080188219" | "20100142485" | "20090316642" | "20090318175" | "20100238857" | "8606336" | "20100111005" | "20100323744" | "20100238872" | "20120008600" | "20090279495" | "20100086065" | "20110170495" | "20080268850").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/18 16:08
S233	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	2018/11/09 18:26
S234	2,976	(H04J3/00).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2018/11/09 22:30

			JPO; DERWENT; IBM_TDB			
S235	5	("9854545").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2018/11/09 23:14
S236	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	2018/11/09 23:47
S237	4,191	(TA OR (timing NEAR2 advanced)) AND (random NEAR2 access NEAR3 preamble)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/09 23:48
S238	1	S234 AND S237	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/09 23:50
S239	3	("9054835").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2018/11/09 23:52
S240	3	("9054835").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/06/05 07:05
S241	41	("20090116434" | "20090274120" | "8606336" | "20110170495" | "20090318175" | "20100086065" | "20100238857" | "20100323744" | "20100041399" | "20090270094" | "20090316642" | "20100111005" | "20100118720").PN.	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/06/05 08:36
S242	3,121	(receiv$3 get$4) SAME (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control))	US-PGPUB; USPAT; USOCR;	OR	ON	2019/06/05 08:38

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S243	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	2019/06/05 08:45
S244	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	2019/06/05 08:46
S245	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	2019/06/26 08:22
S246	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	2019/06/26 08:30
S247	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	2019/06/26 08:32
S248	7,568	timing NEAR2 groups AND @ad<"20100210"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/06/26 08:39
S249	17	timing NEAR2 advanced SAME tim$3 NEAR2 groups AND @ad<"20100210"	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2019/06/26 08:40

			JPO; DERWENT; IBM_TDB			
S250	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	2019/06/27 23:44
S251	6	(forward$3 OR transmit$3 OR send$3) WITH (SYNC OR synchroniz$5) NEAR5 (information OR message OR data) SAME (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	2019/07/09 12:20
S252	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	2019/07/09 12:35
S253	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	2019/07/09 14:55
S254	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	2019/07/09 15:26
S255	77	("2013/0250925").URPN.	USPAT	OR	ON	2019/07/09 15:29
S256	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	2019/07/09 16:58
S257	4	("20120008600").PN.	US-PGPUB; USPAT;	OR	OFF	2019/07/09 17:34

			USOCR; FPRS; JPO; DERWENT			
S258	16,731	carrier ADJ2 aggregation AND timing	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:39
S259	505	RACH SAME carrier ADJ2 aggregation AND timing	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:40
S261	141	RACH SAME carrier ADJ2 aggregation AND timing NEAR2 groups	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:41
S262	141	RACH SAME (CC1 CCs CC2 carriers) ADJ2 aggregation AND timing NEAR2 groups	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:41
S263	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	2019/07/09 17:42
S264	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	2019/07/09 17:43
S265	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	2019/07/09 17:43
S266	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	2019/07/09 17:44
S267	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	2019/07/09 17:44
S268	205	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND (carriers ADJ2 aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance)	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:45
S269	5	(RA (random ADJ access) RACH) SAME (CC1 CCs CC2 AND (carriers ADJ2	US-PGPUB; USPAT;	OR	ON	2019/07/09 17:46

		aggregation)) SAME timing NEAR2 groups SAME (TA timing NEAR2 advance) AND second ADJ timing	FPRS; EPO; DERWENT			
S270	13	("20110243111" | "20110243102" | "20120099577" | "20120250520" | "20120300715" | "20120294272" | "20110243102").PN.	US-PGPUB; USPAT; FPRS; EPO; DERWENT	OR	ON	2019/07/09 17:50
S271	2	("20120300715").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/09 18:12
S272	74	("2012/0300715").URPN.	USPAT	OR	ON	2019/07/09 18:12
S273	3	delegat$3 SAME (component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/23 13:56
S274	6	("20080273610" | "20090186613" | "20090279495").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/23 14:33
S275	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	2019/07/23 23:46
S277	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	2019/07/23 23:48
S278	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	2019/07/23 23:49

S279	2	("20080267165").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 08:45
S280	4	("20120008600").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 23:49
S281	3	("9054835").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 23:52
S282	5	("9854545").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2019/07/24 23:59
S283	60	timing AND (component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 14:40
S284	67	timing AND (component NEAR carrier AND (primary NEAR2 CC)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 14:40
S285	2,491	timing AND (component NEAR carrier AND (primary NEAR2 CC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 14:49
S286	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	2019/07/26 14:49

S287	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	2019/07/26 14:49
S288	12,348	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	2019/07/26 14:51
S291	109	updat$3 NEAR2 timing NEAR2 group	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/07/26 15:04
S292	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	2019/07/26 15:05
S293	2	("20200145949").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2020/08/26 21:41
S294	152,373	(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	2020/08/26 22:12
S295	108,349	(H04L5/001 or H04L5/0007).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/26 22:12
S296	1,453	(H04B1/7087).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	2020/08/26 22:12

			JPO; DERWENT; IBM_TDB			
S297	80	((("KWON") near3 ("Kibum"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/08/26 22:13
S298	28	((("JUNG") near3 ("Myungcheul"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/08/26 22:13
S299	3,343	timing AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/27 12:05
S300	3,491	(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	2020/08/27 12:05
S301	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	2020/08/27 12:05
S302	55	("20080232316" | "20110013581" | "20050053029" | "8125948" | "20110075629" | "20110098074" | "20100240372" | "20110003555" | "20110261714" | "7782899" | "20050053029" | "20080212556" | "20110122794" | "20120147830" | "20110268032" | "20060034204" | "20080232316" | "20100130218" | "20110142009" | "20110235609" | "20100302964" | "20100227569" | "20100285809" | "20120218987").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/27 12:26
S303	3	("20120099577").PN.	US-PGPUB; USPAT; USOCR; FPRS; JPO; DERWENT	OR	OFF	2020/08/27 12:35
S304	11	("2012/0099577").URPN.	USPAT	OR	ON	2020/08/27 12:41

S305	10	("20100238908" | "20110243111" | "20120063425" | "20120099577").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/27 14:02
S306	80	((KIBUM) near2 (KWON)).INV.	US-PGPUB; USPAT	OR	ON	2020/12/18 00:29
S307	28	((MYUNGCHEUL) near2 (JUNG)).INV.	US-PGPUB; USPAT	OR	ON	2020/12/18 00:29
S308	12,975	H04W72/00.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/12/18 00:34
S309	3,310	(H04J3/00).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/12/18 00:35
S310	159,786	(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	2020/12/18 00:35
S311	40	form$3 WITH timing near4 synchronization NEAR7 (UL OR uplink)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/12/18 01:03
S312	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	2020/12/18 01:04
S313	9	delegat$3 NEAR2 CC AND (TA timing) AND ((CC2 CC2 CCs (component NEAR	US-PGPUB; USPAT;	OR	ON	2020/12/18 01:09

		carrier)) AND (primary NEAR2 CC)) AND UL NEAR2 timing	FPRS; EPO; DERWENT			
S314	115,654	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	2020/12/18 01:09
S315	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	2020/12/18 01:09
S316	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	2020/12/18 01:11
S317	17	(RAP OR random ADJ access ADJ preamble) AND (creat$3 form$3) WITH timing near4 synchronization NEAR7 (UL OR uplink)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/12/18 01:12
S318	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	2020/12/18 01:14
S319	60,393	(H04W56/00 OR H04W74/002 OR H04W74/0833).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/12/18 01:20
S320	2,181	H04B7/216.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/12/18 01:20

S321	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	2020/12/18 01:22
S337	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	2020/12/18 10:55
S338	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	2020/12/18 11:02

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S143	3,665	(370/350).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/01/13 11:08
S144	51	(component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:31
S145	7	uplink NEAR timing NEAR group.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:31
S146	22	UL NEAR group.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:31
S147	83	synchronization NEAR request NEAR message.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:32
S148	9	S143 AND S147	US-PGPUB; USPAT	OR	ON	2015/01/13 11:34
S149	2	S146 AND S147	US-PGPUB; USPAT	OR	ON	2015/01/13 11:36
S150	1	S144 AND S147	US-PGPUB; USPAT	OR	ON	2015/01/13 11:36

S151	5,348	uplink AND synchronization.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:37
S152	646	S143 AND S151	US-PGPUB; USPAT	OR	ON	2015/01/13 11:40
S153	1	S146 AND S152	US-PGPUB; USPAT	OR	ON	2015/01/13 11:40
S154	1	S147 AND S152	US-PGPUB; USPAT	OR	ON	2015/01/13 11:40
S155	3	UL NEAR timing NEAR group.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:42
S156	15	(component NEAR carrier AND (primary NEAR CC) AND (second NEAR CC)).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 11:44
S157	3	delegate ADJ CC.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:32
S158	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:32
S159	1	S147 AND S158	US-PGPUB; USPAT	OR	ON	2015/01/13 13:33
S160	10	S144 AND S158	US-PGPUB; USPAT	OR	ON	2015/01/13 13:33
S161	64	(primary ADJ CC) AND (radio NEAR resource NEAR control) AND timing.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 13:34
S163	8,801	(H04W56/0045 OR H04W92/10 OR H04W88/08).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:00
S164	213	(H04B1/7087).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:00
S165	8,686	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:00
S166	3,665	(370/350).CCLS.	US-PGPUB; USPAT	OR	OFF	2015/01/13 15:01

S167	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:01
S168	7	S163 AND S167	US-PGPUB; USPAT	OR	ON	2015/01/13 15:01
S169	86	S167 AND S167	US-PGPUB; USPAT	OR	ON	2015/01/13 15:01
S170	56	S165 AND S167	US-PGPUB; USPAT	OR	ON	2015/01/13 15:02
S171	5,348	uplink AND synchronization.clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:04
S172	431	S163 AND S171	US-PGPUB; USPAT	OR	ON	2015/01/13 15:04
S173	3	S167 AND S172	US-PGPUB; USPAT	OR	ON	2015/01/13 15:04
S174	8,686	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:31
S175	86	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2015/01/13 15:32
S176	56	S174 AND S175	US-PGPUB; USPAT	OR	ON	2015/01/13 15:32
S223	15,660	(H04L5/001 OR H04L5/0007).CPC.	US-PGPUB; USPAT	OR	ON	2017/04/20 10:49
S224	275	uplink AND timing NEAR advance NEAR value.clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 10:50
S225	12	uplink AND timing NEAR advance NEAR value AND RAR.clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 10:50
S226	5	uplink NEAR timing AND TA NEAR value AND RAR.clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 11:02
S227	93	(component NEAR carrier AND (primary NEAR CC)).clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 11:20

S228	236	(primary ADJ CC) AND (radio NEAR resource NEAR control).clm.	US-PGPUB; USPAT	OR	ON	2017/04/20 11:20
S229	0	S223 AND S224 AND S228	US-PGPUB; USPAT	OR	ON	2017/04/20 11:20
S230	21	S223 AND S224	US-PGPUB; USPAT	OR	ON	2017/04/20 11:21
S231	3	S224 AND S228	US-PGPUB; USPAT	OR	ON	2017/04/20 11:21
S322	6	form$3 WITH timing near4 synchronization NEAR7 (UL OR uplink).clm.	US-PGPUB; USPAT	OR	ON	2020/12/18 01:04
S323	85	(TA timing) AND ((CC2 CC2 CCs (component NEAR carrier)) AND (primary NEAR2 CC)).clm.	US-PGPUB; USPAT	OR	ON	2020/12/18 01:04
S324	6	updat$3 NEAR2 timing NEAR2 group AND (primary NEAR2 CC OR PCELL).clm.	US-PGPUB; USPAT	OR	ON	2020/12/18 01:04
S325	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	2020/12/18 01:08
S326	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	2020/12/18 01:08
S327	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	2020/12/18 01:09
S328	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	2020/12/18 01:10
S329	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	2020/12/18 01:12
S330	523	H04B7/216.CPC.	US-PGPUB; USPAT	OR	ON	2020/12/18 01:20
S331	761	(H04J3/00).CPC.	US-PGPUB; USPAT	OR	ON	2020/12/18 01:20

S332	42,755	(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	2020/12/18 01:21
S333	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	2020/12/18 01:21
S336	11	RAP AND (CC OR (component adj carrier)) SAME (RRC OR (radio ADJ resource ADJ control)).clm.	US-PGPUB; USPAT	OR	ON	2020/12/18 01:22
S339	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	2020/12/18 10:57

12/18/2020 11:08:12 AM
C:\Users\ltruong1\Documents\EAST\Workspaces\16-733106_CON15-820980.wsp

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.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/733,106	01/02/2020	Kibum KWON	PPA0010US	6857

7590 02/02/2021

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

EXAMINER	
TRUONG, LAN-HUONG	
ART UNIT	PAPER NUMBER
2464	
NOTIFICATION DATE	DELIVERY MODE
02/02/2021	ELECTRONIC

NOTICE REQUIRING INVENTOR'S OATH OR DECLARATION

☐ An inventor's oath or declaration in compliance with 37 CFR 1.63 or substitute statement in compliance with 37 CFR 1.64 executed by or with respect to each inventor has not yet been submitted.

The inventor's oath or declaration or substitute statement dated 01-02-2020 is defective. The inventor's oath or declaration does not comply with 37 CFR 1.63 or the substitute statement does not comply with 37 CFR 1.64 because it:

☐ does not include a statement that the person executing the oath or declaration or substitute statement believes the named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application for which the oath or declaration is being submitted.

☐ does not state that the application was made or was authorized to be made by the person executing the oath or declaration or substitute statement.

☐ does not acknowledge that any willful false statement made in such oath or declaration or substitute statement is punishable under section 1001 of title 18 by fine or imprisonment of not more than 5 years, or both.

☐ does not identify the person executing the oath or declaration or substitute statement by his or her legal name.

☐ does not identify the application to which the oath or declaration or substitute statement is directed.

☑ Other: 2nd inventor's name does not match ADS

The substitute statement dated _____ does not comply with 37 CFR 1.64 because it:

☐ does not identify the inventor with respect to whom the statement applies.

☐ does not identify the relationship to the non-signing inventor.

☐ does not identify the circumstances permitting execution of the statement.

☐ was signed by someone other than the applicant.

☐ Other: _____

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor MUST be filed **no later than the date on which the issue fee is paid.** See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application. This period for reply is not extendable under 37 CFR 1.136(a).

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

(571)-272-4200 or 1(888)-786-0101
Patent Publication Branch
Office of Data Management

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/733,106	01/02/2020	Kibum KWON	PPA0010US	6857

7590 02/02/2021

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

EXAMINER	
TRUONG, LAN-HUONG	
ART UNIT	PAPER NUMBER
2464	
NOTIFICATION DATE	DELIVERY MODE
02/02/2021	ELECTRONIC

NOTICE REQUIRING INVENTOR'S OATH OR DECLARATION

☐ An inventor's oath or declaration in compliance with 37 CFR 1.63 or substitute statement in compliance with 37 CFR 1.64 executed by or with respect to each inventor has not yet been submitted.

The inventor's oath or declaration or substitute statement dated 01-02-2020 is defective. The inventor's oath or declaration does not comply with 37 CFR 1.63 or the substitute statement does not comply with 37 CFR 1.64 because it:

☐ does not include a statement that the person executing the oath or declaration or substitute statement believes the named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application for which the oath or declaration is being submitted.

☐ does not state that the application was made or was authorized to be made by the person executing the oath or declaration or substitute statement.

☐ does not acknowledge that any willful false statement made in such oath or declaration or substitute statement is punishable under section 1001 of title 18 by fine or imprisonment of not more than 5 years, or both.

☐ does not identify the person executing the oath or declaration or substitute statement by his or her legal name.

☐ does not identify the application to which the oath or declaration or substitute statement is directed.

☑ Other: 2nd inventor's name does not match ADS

The substitute statement dated _____ does not comply with 37 CFR 1.64 because it:

☐ does not identify the inventor with respect to whom the statement applies.

☐ does not identify the relationship to the non-signing inventor.

☐ does not identify the circumstances permitting execution of the statement.

☐ was signed by someone other than the applicant.

☐ Other: _____

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor MUST be filed **no later than the date on which the issue fee is paid.** See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application. This period for reply is not extendable under 37 CFR 1.136(a).

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

(571)-272-4200 or 1(888)-786-0101
Patent Publication Branch
Office of Data Management

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner: TRUONG, LAN-HUONG
Kibum KWON *et al.*	Group Art Unit: 2464
Application No.: 16/733,106	Confirmation No.: 6857
Filing Date: January 2, 2020	Attorney Docket No.: PPA0010US

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

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTICE REQUIRING INVENTOR'S OATH AND DECLARATION

Dear Commissioner:

In response to the Notice Requiring Inventor's Oath or Declaration ("Notice") dated February 2, 2021, Applicant respectfully submits the second inventor's oath or declaration in compliance with 37 CFR 1.63, which has been previously filed in the Application No. 14/733,068, now issued as Patent No. 9,854,545. In particular, the submitted oath or declaration corrects a typographical or transliteration error in the second inventor's name from "Myung Cheul JUNG" to "Myungcheul JUNG". A copy of the Notice is also enclosed herewith. No petition fee is required at this time. Any deficiencies may be charged to our Deposit Account No. 603320.

Respectfully submitted,

/Yeasun Yoon, Reg.# 73663/

Yeasun Yoon
Reg. No. 73,663

Date: April 14, 2021

CUSTOMER NO. 167455
Capitol IP Law Group, PLLC
1918 18th St NW Unit 4
Washington DC 20009
Tel: 571-206-4847
Fax: 703-643-9789
YY/esp

Attachments: (1) Notice Requiring Inventor's Oath and Declaration
(2) Second Inventor's Oath and Declaration

IPR2023-01269
Pantech Wireless, LLC Ex. 2021
Page 319 of 345

Electronic Acknowledgement Receipt

EFS ID:	42458153
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
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:	PPA0010US
Receipt Date:	14-APR-2021
Filing Date:	02-JAN-2020
Time Stamp:	23:48:18
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	Oath or Declaration filed	PPA0010US-Declaration.pdf	366721 64d48e121a1482ced669a2def13bb868017 02059	no	2

Warnings:

Information:					
2	Miscellaneous Incoming Letter	PPA0010US-Notice.pdf	59367 b5d616131fddbe566d3dd22adc96c2ad666dd745	no	1
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	PPA0010US-Response_.pdf	222908 80efe1810679a0d8bacdd52053b9efe7a39d4fca	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	648996	

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.

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

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: Myungcheul

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.**

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.

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
16733106	02-Jan-2020	Kibum KWON	PPA0010US	6857

TITLE OF INVENTION :

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

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Regular Undiscounted	Utility under 35 USC 111(a)	2464	350000	LAN-HUONG TRUONG

Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
$1200	$0	$1200	14-Apr-2021	$0

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
167455 Capitol IP Law Group, PLLC 1918 18th St., Unit 4, NW Washington DC 20009 UNITED STATES 434-906-2975 patent@capitoliplaw.com	
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☐ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status

Change in Entity Status

○ Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment. If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.

○ Applicant asserting small entity status. See 37 CFR 1.27.
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.

◉ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☒ Issue Fee

☐ I authorize USPTO to apply my previously paid issue fee to the current fees due

☐ Publication Fee

☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____

☐ Advance Order - # of copies _____

☒ If **in addition to** the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency or credit any overpayment, to Deposit Account Number 603320 . The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1. Capitol IP Law Group, PLLC
2.
3.

5.Assignee Name(s) and Residence Data To Be Printed

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

Name	City	State	Country	Category
PANTECH CORPORATION	SEOUL		korea, republic of	corporation

6.Signature

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 has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Yeasun Yoon, Reg.# 73663/	**Date**	04-14-2021
Name	Yeasun Yoon	**Registration Number**	73663

Electronic Patent Application Fee Transmittal

Application Number:	16733106
Filing Date:	02-Jan-2020
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:	PPA0010US

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 APPL ISSUE FEE	1501	1	1200	1200
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1200**

Electronic Acknowledgement Receipt

EFS ID:	42458054
Application Number:	16733106
International Application Number:	
Confirmation Number:	6857
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:	PPA0010US
Receipt Date:	14-APR-2021
Filing Date:	02-JAN-2020
Time Stamp:	23:50:49
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	E20214DN50450591
Deposit Account	
Authorized User	

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

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)	Web85b.pdf	46048 2b363a08426f2b0ac511470ab34de7138892b3f3	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32015 2fbceb555c2b29be59cac9e9a0e448e50629648d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	78063		

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.

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.
16/733,106	05/18/2021	11012954	PPA0010US	6857

167455 7590 04/28/2021

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

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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 0 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).

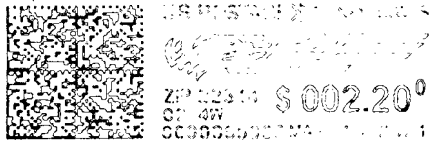
Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

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

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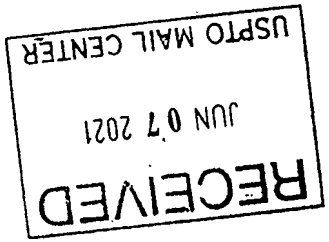


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Washington DC 20009

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IPR2023-00129
Pantech Wireless, LLC Ex. 2021
Page 331 of 345

United States of America

To Promote the Progress of Science and Useful Arts

The Director

of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Performing the Functions and Duties of the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office

IPR2023-01269
Pantech Wireless, LLC Ex. 2021
Page 332 of 345

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C …). The first artifact folder for an artifact type receives the letter A, the second B, etc.. Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

16733106ZA

Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

☐ CD(s) containing:

- computer program listing — Doc Code: Artifact — ☐ Artifact Type Code: P
- pages of specification and/or sequence listing and/or table — Doc Code: Artifact — ☐ Artifact Type Code: S
- content unspecified or combined — Doc Code: Artifact — ☐ Artifact Type Code: U
- voluntary electronic submission — Doc Code: Artifact — ☐ Artifact Type Code: T

☐ Stapled Set(s) Color Documents or B/W Photographs
Doc Code: Artifact Artifact Type Code: C

☐ Microfilm(s)
Doc Code: Artifact Artifact Type Code: F

☐ Video tape(s)
Doc Code: Artifact Artifact Type Code: V

☐ Model(s)
Doc Code: Artifact Artifact Type Code: M

☐ Bound Document(s)
Doc Code: Artifact Artifact Type Code: B

☐ Confidential Information Disclosure Statement or Other Documents marked Proprietary, Trade Secrets, Subject to Protective Order, Material Submitted under MPEP 724.02, etc.
Doc Code: Artifact Artifact Type Code X

1 Other, description: **PATENT GRANT**
Doc Code: Artifact Artifact Type Code: Z

August 31, 2016

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Eastern District of Texas, Texarkana Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
5:21-CV-00065	5/25/2021	for the Eastern District of Texas, Texarkana Division

PLAINTIFF	DEFENDANT
PANTECH CORPORATION	COOLPAD GROUP LIMITED, COOLPAD TECHNOLOGIES INC., YULONG COMPUTER TELECOMMUNICATION SCIENTIFIC (SHENZHEN) CO., LTD., and DIGITAL TECH INC. (BVI)

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,538,411	9/17/2013	Pantech Corporation
2	10,841,142	11/17/2020	Pantech Corporation
3	9,237,566	1/12/2016	Pantech Corporation
4	8,649,346	2/11/2014	Pantech Corporation
5	11,012,954	5/18/2021	Pantech Corporation

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
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AO 120 (Rev. 08/10)

TO:	**Mail Stop 8** **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

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PANTECH CORPORATION	COOLPAD TECHNOLOGIES INC., YULONG COMPUTER TELECOMMUNICATION SCIENTIFIC (SHENZHEN) CO., LTD.

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4	8,649,346	2/11/2014	Pantech Corporation
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DATE INCLUDED	INCLUDED BY
11/26/2021	☑ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,288,824	3/15/2016	Pantech Corporation
2	9,152,479	10/6/2015	Pantech Corporation
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DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
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PLAINTIFF	DEFENDANT
PANTECH CORPORATION	COOLPAD TECHNOLOGIES INC., YULONG COMPUTER TELECOMMUNICATION SCIENTIFIC (SHENZHEN) CO., LTD.

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

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PLAINTIFF	DEFENDANT
PANTECH CORPORATION	COOLPAD GROUP LIMITED, COOLPAD TECHNOLOGIES INC., YULONG COMPUTER TELECOMMUNICATION SCIENTIFIC (SHENZHEN) CO. LTD. and DIGITAL TECH INC. (BVI)

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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT
It is ORDERED that the above-titled cause is DISMISSED WITH PREJUDICE.

CLERK	(BY) DEPUTY CLERK	DATE
David A. O'Toole	S. Oliver	**5/6/22**

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
5:21-CV-00065	5/25/2021	for the Eastern District of Texas, Texarkana Division

PLAINTIFF	DEFENDANT
PANTECH CORPORATION	COOLPAD GROUP LIMITED, COOLPAD TECHNOLOGIES INC., YULONG COMPUTER TELECOMMUNICATION SCIENTIFIC (SHENZHEN) CO., LTD., and DIGITAL TECH INC. (BVI)

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,809,641	10/26/2004	Pantech Corporation
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David A. O'Toole	S. Oliver	**5/6/22**

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☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
5:22-cv-00069	6/3/2022	for the Eastern District of Texas, Texarkana Division

PLAINTIFF	DEFENDANT
PANTECH CORPORATION and PANTECH WIRELESS, LLC	ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,548,839	1/17/2017	Pantech Corporation
2	11,172,493	11/9/2021	Pantech Wireless
3	8,587,710	11/19/2013	Pantech Corporation
4	11,012,954	5/18/2021	Pantech Corporation
5	8,893,052	11/18/2014	Pantech Corporation

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
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AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Eastern District of Texas, Texarkana Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
5:22-cv-00069	6/3/2022	for the Eastern District of Texas, Texarkana Division

PLAINTIFF	DEFENDANT
PANTECH CORPORATION and PANTECH WIRELESS, LLC	ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	10,869,247	12/15/2020	Pantech Wireless
2	9,063,654	6/23/2015	Pantech Corporation
3	10,162,490	12/25/2018	Pantech Corporation
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

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1	9,548,839	1/17/2017	Pantech Corporation
2	11,172,493	11/9/2021	Pantech Wireless
3	8,587,710	11/19/2013	Pantech Corporation
4	11,012,954	5/18/2021	Pantech Corporation
5	8,893,052	11/18/2014	Pantech Corporation

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