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NOTICE OF ALLOWANCE AND FEE(S) DUE

76277 7590 11/10/2020

IP LEGAL SERVICES, LLC
P.O. Box 651325
Sterling, VA 20165

EXAMINER	
YEUNG, MANG HANG	
ART UNIT	PAPER NUMBER
2463	

DATE MAILED: 11/10/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/346,108	04/29/2019	Kyujin PARK	811.0170	4692

TITLE OF INVENTION: METHOD AND DEVICE FOR ALLOCATING DATA CHANNEL RESOURCE FOR NEXT-GENERATION WIRELESS ACCESS NETWORK

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	02/10/2021

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.

PTOL-85 (Rev. 02/11)

Petitioners' Exhibit 1026
Nokia of America., et al. v. KT Corporation, et al.
Case No. IPR2025-00137: U.S. Patent No. 11,540,272
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PART B - FEE(S) TRANSMITTAL

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

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

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

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

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

76277 7590 11/10/2020

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P.O. Box 651325
Sterling, VA 20165

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.

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/346,108	04/29/2019	Kyujin PARK	811.0170	4692

TITLE OF INVENTION: METHOD AND DEVICE FOR ALLOCATING DATA CHANNEL RESOURCE FOR NEXT-GENERATION WIRELESS ACCESS NETWORK

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	02/10/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
YEUNG, MANG HANG	2463	370-330000

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 _____

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

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

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

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Petitioners' Exhibit 1026
Nokia of America., et al. v. KT Corporation, et al.
Case No. IPR2025-00137: U.S. Patent No. 11,540,272
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16/346,108	04/29/2019	Kyujin PARK	811.0170	4692

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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.

PTOL-85 (Rev. 02/11)

Petitioners' Exhibit 1026
Nokia of America., et al. v. KT Corporation, et al.
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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. 16/346,108	Applicant(s) PARK et al.	
	Examiner MANG HANG YEUNG	Art Unit 2463	AIA (FITF) Status Yes

-- 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 9/3/2020.
   ☐ 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 See Continuation Sheet . 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 _____.

/MANG HANG YEUNG/
Primary Examiner, Art Unit 2463

Petitioners' Exhibit 1026
Nokia of America., et al. v. KT Corporation, et al.
Case No. IPR2025-00137: U.S. Patent No. 11,540,272
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Continuation of 3. The allowed claim(s) is/are: 1,3-6,8-9,12,14-17 and 19-22

DETAILED ACTION

1. The instant application having Application **No. 16/346108** filed on **04/29/2019** is presented for examination by the examiner.

Notice of Pre-AIA or AIA Status

2. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Allowable Subject Matter

3. **Claims 1, 3-6, 8, 9, 12, 14-17, 19-22** are allowed (renumbered as claims 1-16). **Claims 2, 7, 10, 11, 13, 18** were cancelled. The following is an examiner's statement of reasons for allowance:

4. **Claims 1 and 12** are allowed over the prior arts of record because the Examiner found neither prior arts cited in its entirety, nor based on the prior arts found any motivation to combine any of the said prior art references which teach the combined claimed limitations as recited in the claims **1 and 12**. **Claims 3-6, 8, 9, 14-17, 19-22** are also allowed since they depend on claims **1 and 12**.

5. 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 MANG HANG YEUNG whose telephone number is (571)270-7319. The examiner can normally be reached on M-F 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark H. Rinehart can be reached on (571) 272-3632. 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.

/MANG HANG YEUNG/
Primary Examiner, Art Unit 2463

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	16/346,108	Confirmation No.	:	4692
Inventor(s)	:	Kyujin Park et al.	Examiner	:	Mang Hang Yeung
Filed	:	April 29, 2019	Art Unit	:	2463
Applicant	:	KT Corporation			
Docket No.	:	811.0170			
Customer No.	:	76277			

Title: Method and Device for Allocating Data Channel Resource for Next-Generation Wireless Access Network

RESPONSE UNDER 37 C.F.R. 1.111

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

In response to the Non-Final Office Action dated **June 5, 2020**, please reconsider the above-identified patent application in view of the following.

Amendments to the Claims are reflected in the claim listing beginning on page **2** of this document.

Remarks begin on page **6** of this document.

Petitioners' Exhibit 1026
Nokia of America., et al. v. KT Corporation, et al.
Case No. IPR2025-00137: U.S. Patent No. 11,540,272
Page 000009

Claims

This listing of the claims will replace all prior versions and listings of the claims in the application.

1. (**Currently Amended**) A method of a base station for allocating a time-domain resource for downlink (DL) data channel (PDSCH) transmission/reception or uplink (UL) data channel (PUSCH) transmission/reception, the method comprising:

allocating the time-domain resource based on a slot or a mini-slot of a subframe as a unit of an orthogonal frequency-division multiplexing (OFDM) symbol and at the same time, transmitting, to a user equipment, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for the DL data channel (PDSCH) transmission/reception or the UL data channel (PUSCH) transmission/reception in the slot or the mini-slot, wherein the mini-slot comprises fewer symbols than the slot; and

transmitting, to the user equipment, control information selecting one of the symbol allocation information included in the time-domain resource configuration information,

wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment, and

wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

2. (**Canceled**)

3. (**Currently Amended**) The method according to claim 1 [[2]], wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols and one or more lengths.

4. (**Currently Amended**) The method according to claim 1 [[2]], wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling.

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5. (**Currently Amended**) The method according to claim 1 [[2]], wherein the transmitting of the control information to the user equipment is performed by transmitting the control information including information indicating one of the indexes to the user equipment.

6. (Original) The method according to claim 5, wherein the control information is DL assignment DL control information, and

wherein the transmitting of the control information to the user equipment is performed by transmitting the DL assignment DL control information including information indicating one of the indexes to the user equipment through a DL control channel.

7. (**Canceled**)

8. (**Currently Amended**) The method according to claim 1 [[7]], wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths.

9. (**Currently Amended**) The method according to claim 1 [[7]], wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling.

10. (Canceled)

11. (Canceled)

12. (**Currently Amended**) A method of a user equipment for allocating a time-domain resource for downlink (DL) data channel (PDSCH) transmission/reception or uplink (UL) data channel (PUSCH) transmission/reception, the method comprising:

allocating the time-domain resource based on a slot or a mini-slot of a subframe as a unit of an orthogonal frequency division multiplexing (OFDM) symbol and at the same time, receiving, from a base station, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for the DL data channel

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(PDSCH) transmission/reception or the UL data channel (PUSCH) transmission/reception in the slot or the mini-slot, wherein the mini-slot comprises fewer symbols than the slot; and

receiving, from the base station, control information selecting one of the symbol allocation information included in the time-domain resource configuration information,

wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment, and

wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

13. (**Canceled**)

14. (**Currently Amended**) The method according to claim 12 [[13]], wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols and one or more lengths.

15. (**Currently Amended**) The method according to claim 12 [[13]], wherein the receiving of the time-domain resource configuration information from the base station is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception by the base station to the user equipment through user equipment-specific high layer signaling.

16. (**Currently Amended**) The method according to claim 12 [[13]], wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment.

17. (Original) The method according to claim 16, wherein the control information is DL assignment DL control information, and

wherein the receiving of the control information from the base station is performed by transmitting the DL assignment DL control information including information indicating one of the indexes by the base station to the user equipment through a DL control channel.

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18. (**Canceled**)

19. (**Currently Amended**) The method according to claim 12 [[18]], wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths.

20. (**Currently Amended**) The method according to claim 12 [[18]], wherein the receiving of the time-domain resource configuration information from the base station is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception by the base station to the user equipment through user equipment-specific high layer signaling.

21. (**Currently Amended**) The method according to claim 12 [[18]], wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment.

22. (**Currently Amended**) The method according to claim 21 [[12]], wherein the control information is UL grant DL control information, and

wherein the receiving of the control information from the base station is performed by transmitting the UL grant DL control information including information indicating one of the indexes by the base station to the user equipment through a DL control channel.

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REMARKS

Claims 1-9 and 12-22 were previously pending in the application. Claims 1-9 and 12-22 are rejected. Claims 1, 3, 4, 5, 8, 9, 12, 14, 15, 16, 19, 20, 21, and 22 are amended herein. Claims 2, 7, 13, and 18 are cancelled herein. No new claims are added herein. Assuming entry of this amendment, claims 1, 3-6, 8, 9, 12, 14-17, and 19-22 are pending in the application. Applicant respectfully requests that the Examiner reconsider the application in view of the foregoing amendments and the remarks below.

Rejections

35 U.S.C. §112(b)

On page 3 of the Office Action, the Examiner rejects claims 1-9 and 12-22 under 35 U.S.C. §112(b) as being indefinite. In particular, the Examiner asserts that the term "mini-slot" in independent claims 1 and 12 is relative and indefinite. Applicant herein amends independent claims 1 and 12 to recite "wherein the mini-slot comprises fewer symbols than the slot," for example as described in paragraphs [0055]-[0060] of Applicant's specification as originally filed. Furthermore, the term "mini-slot" has a generally understood meaning in the context of 5G New Radio that would be known to a skilled artisan. Thus, Applicant asserts that claims 1 and 12 are not indefinite.

Applicant also herein amends claim 22 to correct a typographical error in the claim dependency, which provides proper antecedent basis for "the indexes".

Thus, Applicant believes that the rejections under §112(b) are overcome, and respectfully requests that these rejections be withdrawn.

35 U.S.C. §102(a)(1)

On page 4 of the Office Action, the Examiner rejects claims 1 and 12 under 35 U.S.C. §102(a)(1) as being anticipated by U.S. Patent Application Publication No. 2019/0289605 to Futaki (hereinafter "*Futaki*").

Applicant has herein amended independent claims 1 and 12 to recite that allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception and allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, "the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment." See Applicant's specification as originally filed, for example at paragraphs [0050]-[0060], [0072]-[0075], and [0133]-[0134].

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Futaki is directed to a system that transmits using different TTIs based on the length of a subframe. See *Futaki*, paragraph [0011]. However, in the Applicant's claimed system, the subframe has a set duration (e.g., 1ms) allowing for a slot or mini-slot to be defined as a time unit for UL/DL data scheduling. See Applicant's paragraph [0055]. Further, *Futaki* communicates over multiple subframes, not slots or mini-slots of a single subframe. See *Futaki* paragraph [0012] and claim 1. Additionally, *Futaki* is entirely silent regarding sending "time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment" for the PDSCH and PUSCH.

Therefore, *Futaki* does not disclose each and every element of Applicant's claims, and the rejection under §102 cannot be maintained. Accordingly, Applicant respectfully requests that the rejection of claims 1 and 12 under 35 U.S.C. §102(a)(1) as being anticipated by *Futaki* be withdrawn.

On pages 5-8 of the Office Action, the Examiner rejects claims 1-6, 12-17 and 22 under 35 U.S.C §102(a)(1) as being anticipated by U.S. Patent Application Publication No. 2014/0376422 to Dai et al. (hereinafter "*Dai*").

Similarly to *Futaki*, *Dai* also communicates across multiple subframes and is also silent regarding sending "time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment" for the PDSCH and PUSCH."

Therefore, *Dai* does not disclose each and every element of Applicant's independent claims 1 and 12, and the rejection under §102 cannot be maintained. Accordingly, Applicant respectfully requests that the rejection of claims 1-6, 12-17 and 22 under 35 U.S.C. §102(a)(1) as being anticipated by *Dai* be withdrawn.

On pages 9-12 of the Office Action, the Examiner rejects 7-9 and 18-21 under 35 U.S.C. §103 as being unpatentable over *Dai* in view of U.S. Patent Application Publication No. 2014/0105191 to Yang et al. (hereinafter "*Yang*"). Claims 7-9 include all the features of claim 1, from which they depend, and claims 18-21 include all the features of claim 12, from which they depend.

As described above in regard to independent claims 1 and 12, *Dai* communicates across multiple subframes and fails to disclose or suggest sending "time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation

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information and indexes indicating each of the symbol allocation information for each user equipment" for the PDSCH and PUSCH." *Yang* also communicates across separate and distinct subframes. See paragraph [0037]. Although the Examiner points to paragraph [0109] of *Yang* as disclosing sending "time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment" for the PDSCH and PUSCH, *Yang* instead states that the data reception/transmission position of a given UE can be determined by an ID of each UE. Therefore, *Yang* does not overcome the deficiencies of *Dai*. Accordingly, Applicant respectfully submits that the cited prior art references, whether taken alone or in combination, fail to disclose or suggest every element of Applicant's claims. Therefore, Applicant respectfully requests that the rejections under §103 be withdrawn.

It is believed that all the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for withdrawing the prior art cited with regards to any or all pending claims that have not been expressed. Finally, nothing in this paper should be construed as intent to concede any issue regarding any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

The Assistant Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 60-2802, including, but not limited to, any charges for extensions of time under 37 C.F.R. §1.136.

Respectfully submitted,

Date: 3 September 2020 /Joung Kook Park/

Customer No. 76277
IP Legal Services, LLC
P.O. Box 651325
Sterling, VA 20165

Joung Kook Park, Reg. No. 69,192
Agent for Applicant
(571) 267-7183 (phone)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/346,108	04/29/2019	Kyujin PARK	811.0170	4692

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IP LEGAL SERVICES, LLC
P.O. Box 651325
Sterling, VA 20165

EXAMINER	
YEUNG, MANG HANG	

ART UNIT	PAPER NUMBER
2463	

NOTIFICATION DATE	DELIVERY MODE
06/05/2020	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):

email@iplsllc.com

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Office Action Summary	**Application No.** 16/346,108	**Applicant(s)** PARK et al.	
	Examiner MANG HANG YEUNG	**Art Unit** 2463	**AIA (FITF) Status** Yes

-- 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 4/29/2019.

☐ 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) 1-9 and 12-22 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) 1-9 and 12-22 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 4/29/2019 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. _____.

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: _____.

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DETAILED ACTION

1. The instant application having Application **No. 16/346108** filed on **04/29/2019** is presented for examination by the examiner.

Notice of Pre-AIA or AIA Status

2. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Priority

3. As required by M.P.E.P. 201.14(c), acknowledgement is made of applicant's claim for priority based on application filed on **10/31/2016 (KOREA, REPUBLIC OF 10-2016-0143013)** and **10/27/2017 (KOREA, REPUBLIC OF 10-2017-0140898)**. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 1-9, 12-22** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

a. Regarding **claims 1 and 12**, the term "**mini-slot**" is a relative term which renders the claim indefinite. The word "**mini**" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. *(i.e. it is unclear how small or narrow a slot has to be in order to be considered as a **mini-slot**.)*

i. **Claims 2-9, 13-22** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph for at least the reason stated above. **Claims 2-9, 13-22** depend on **claims 1 and 12** respectively; however, they do not add any feature or subject matter that would solve any of the deficiencies of **claims 1 and 12**.

b. **Claim 22** recites the limitation "**the indexes**". However, there is insufficient antecedent base for this limitation in the claims.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

7. **Claims 1, 12** are rejected under 35 U.S.C. 102(a)(2) as being anticipated by FUTAKI (US Patent Publication # 2019/0289605 A1.)

As per **claim 1**, FUTAKI discloses "**A method of a base station for allocating a time-domain resource for** downlink (DL) data channel (PDSCH) transmission/reception or **uplink (UL) data channel (PUSCH) transmission/reception, the method comprising**: **allocating the time-domain resource based on a slot** or a mini-slot **as a unit of an orthogonal frequency-division multiplexing (OFDM) symbol and at the same time**, **transmitting, to a user equipment, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for** the DL data channel (PDSCH) transmission/reception or **the UL data channel (PUSCH) transmission/reception in the slot** or the mini-slot; and **transmitting, to the user equipment, control information selecting one of the symbol allocation information included in the time-domain resource configuration information**" as [(claim 16), receiving uplink grant information in last 3 Orthogonal Frequency Division Multiplexing (OFDM) symbols of a first subframe, the uplink grant information providing resource allocation in a latter slot of a second subframe following the first subframe; and transmitting, based on the resource allocation, Physical Uplink Shared Channel (PUSCH) by one or more OFDM symbols in the latter slot of the second subframe following the first subframe.]

As per **claim 12**, as [see rejection of claim 1.]

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

9. **Claims 1-6, 12-17, 22** are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Dai et al. (US 2014/0376422 A1)

As per **claim 1**,Dai discloses "**A method of a base station for allocating a time-domain resource for** downlink (DL) data channel (PDSCH) transmission/reception or **uplink (UL) data channel (PUSCH) transmission/reception, the method comprising**:" as [(par. 0166), The base station transmits in the PDSCH region in the first time slot of the subframe n (as defined in LTE R8, a PDCCH is transmitted in the first m OFDM symbols in the subframe n, and the remaining symbols in the first time slot of the subframe n represent the PDSCH region) UL Grant information, and transmits in the second time slot of the subframe n-1 DL Grant information.] **"allocating the time-domain resource based on a slot** or a mini-slot **as a unit of an orthogonal frequency-division multiplexing (OFDM) symbol and at the same time**, **transmitting, to a user equipment, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for** the DL data channel (PDSCH) transmission/reception or **the UL data channel (PUSCH) transmission/reception in the slot** or the mini-slot;" [(par. 0168), the UE receives in the subframe n the PDSCH according to the DL Grant information, and the UE transmits in the

uplink subframe n+4 the PUSCH according to the UL Grant information. (Fig. 6), each subframe has M OFDM symbols.] "and **transmitting, to the user equipment, control information selecting one of the symbol allocation information included in the time-domain resource configuration information**" [(par. 0166), The base station transmits in the PDSCH region in the first time slot of the subframe n UL Grant information, and transmits in the second time slot of the subframe n-1 DL Grant information. (par. 0168), the UE receives in the subframe n the PDSCH according to the DL Grant information, and the UE transmits in the uplink subframe n+4 the PUSCH according to the UL Grant information. (Fig. 6), each subframe has M OFDM symbols.]

As per **claim 2**, Dai discloses "**The method according to claim 1**," as [see rejection of claim 1.] "**wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment**" as [(par. 0164), The UE detects in the first time slot of the subframe n the downlink control information for the subframe n which relates to PUSCH scheduling, and detects in the second time slot of the subframe n-1 the downlink control information for the subframe n which relates to PDSCH scheduling.]

As per **claim 3**, Dai discloses "**The method according to claim 1**," as [see rejection of claim 1.] "**wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols and one or more**

lengths" [(par. 0164), The UE detects in the first time slot of the subframe n the downlink control information for the subframe n which relates to PUSCH scheduling, and detects in the second time slot of the subframe n-1 the downlink control information for the subframe n which relates to PDSCH scheduling.]

As per **claim 4**, Dai discloses "**The method according to claim 2**," as [see rejection of claim 2.] "**wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling**" [(par. 0164), The UE detects in the first time slot of the subframe n the downlink control information for the subframe n which relates to PUSCH scheduling, and detects in the second time slot of the subframe n-1 the downlink control information for the subframe n which relates to PDSCH scheduling.]

As per **claim 5**, Dai discloses "**The method according to claim 2**," as [see rejection of claim 2.] "**wherein the transmitting of the control information to the user equipment is performed by transmitting the control information including information indicating one of the indexes to the user equipment**" [(par. 0164), The UE detects in the first time slot of the subframe n the downlink control information for the subframe n which relates to PUSCH scheduling, and detects in the second time slot of the subframe n-1 the downlink control information for the subframe n which relates to PDSCH scheduling.]

As per **claim 6**, Dai discloses "**The method according to claim 5**," as [see rejection of claim 5.] "**wherein the control information is DL assignment DL control information, and wherein the transmitting of the control information to the user equipment is performed by transmitting the DL assignment DL control information including information indicating one of the indexes to the user equipment through a DL control channel**" [(par. 0164), The UE detects in the first time slot of the subframe n the downlink control information for the subframe n which relates to PUSCH scheduling, and detects in the second time slot of the subframe n-1 the downlink control information for the subframe n which relates to PDSCH scheduling.]

As per **claims 12-17**, as [see rejections of claims 1-6.]

As per **claim 22**, Dai discloses "**The method according to claim 12**," as [see rejection of claim 12.] "**wherein the control information is UL grant DL control information, and wherein the receiving of the control information from the base station is performed by transmitting the UL grant DL control information including information indicating one of the indexes by the base station to the user equipment through a DL control channel**" [(par. 0164), The base station transmits in the PDSCH region in the first time slot of the subframe n UL Grant information, and transmits in the second time slot of the subframe n-1 DL Grant information. (par. 0168), the UE receives in the subframe n the PDSCH according to the DL Grant information, and the UE transmits in the uplink subframe n+4 the PUSCH according to the UL Grant information. (Fig. 6), each subframe has M OFDM symbols.]

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 7-9, 18-21** are rejected under 35 U.S.C. 103 as being unpatentable over Dai et al. (US 2014/0376422 A1) in view of Yang et al. (US 2014/0105191 A1).

As per **claim 7**, Dai discloses "**The method according to claim 1**," as [see rejection of claim 1.]

Dai does not explicitly disclose "wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment".

However, Yang discloses "**wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment**" as [(par. 0109), Information on a data reception position (e.g. bit position and/or frequency/code/time resource) of each UE in a PDSCH, information on a PUSCH transmission

position (e.g. frequency/code/time resource) of each UE in a UL resource allocated through a UL grant. (par. 0035), In a cellular OFDM wireless packet communication system, uplink/downlink data packet transmission is performed on a subframe-by-subframe basis. A subframe is defined as a predetermined time interval including a plurality of OFDM symbols.]

Dai et al. (US 2014/0376422 A1) and Yang et al. (US 2014/0105191 A1) are analogous art because they are the same field of endeavor of network communication.

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to incorporate Yang's teaching into Dai's teaching. The motivation for making the above modification would be to provide a method and device for efficiently scheduling/feeding back for MTC (Machine-Type-Communication). (Yang, par. 0003)

As per **claim 8**, Dai in view of Yang discloses "**The method according to claim 7**," as [see rejection of claim 7.]

Dai discloses "**wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths**" as [(par. 0166), The base station transmits in the PDSCH region in the first time slot of the subframe n UL Grant information, and transmits in the second time slot of the subframe n-1 DL Grant information. (par. 0168), the UE receives in the subframe n the PDSCH according to the DL Grant information, and the UE transmits in the uplink subframe n+4 the PUSCH according to the UL Grant information. (Fig. 6), each subframe has M OFDM symbols.]

As per **claim 9**, Dai in view of Yang discloses "**The method according to claim 7**," as [see rejection of claim 7.]

Yang discloses "**wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling**" as [(par. 0080), In simplest form, all UL transmission related control information (RB RA, MCS, TB size, etc.) can be configured through higher layer signaling. In other words, when a bit corresponding to the UE in a PDCCH DCI format indicates UL transmission, the UE can perform UL transmission (e.g. PUSCH transmission) using a UL transmission resource predetermined by a higher layer.]

Dai et al. (US 2014/0376422 A1) and Yang et al. (US 2014/0105191 A1) are analogous art because they are the same field of endeavor of network communication.

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to incorporate Yang's teaching into Dai's teaching. The motivation for making the above modification would be to provide a method and device for efficiently scheduling/feeding back for MTC (Machine-Type-Communication). (Yang, par. 0003)

As per **claims 18-20**, as [see rejection of claims 7-9.]

As per **claim 21**, Dai in view of Yang discloses "**The method according to claim 18**," as [see rejection of claim 18.]

Yang discloses "**wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment**" as [(par. 0080), In simplest form, all UL transmission related control information (RB RA, MCS, TB size, etc.) can be configured through higher layer signaling. In other words, when a bit corresponding to the UE in a PDCCH DCI format indicates UL transmission, the UE can perform UL transmission (e.g. PUSCH transmission) using a UL transmission resource predetermined by a higher layer.]

Dai et al. (US 2014/0376422 A1) and Yang et al. (US 2014/0105191 A1) are analogous art because they are the same field of endeavor of network communication.

It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to incorporate Yang's teaching into Dai's teaching. The motivation for making the above modification would be to provide a method and device for efficiently scheduling/feeding back for MTC (Machine-Type-Communication). (Yang, par. 0003)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MANG HANG YEUNG whose telephone number is (571)270-7319. The examiner can normally be reached on M-F 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark H. Rinehart can be reached on (571) 272-3632. 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.

/MANG HANG YEUNG/
Primary Examiner, Art Unit 2463

【CLAIMS】

1. A method of a base station for allocating a time-domain resource for downlink (DL) data channel (PDSCH) transmission/reception or uplink (UL) data channel (PUSCH) transmission/reception, the method comprising:

allocating the time-domain resource based on a slot or a mini-slot as a unit of an orthogonal frequency-division multiplexing (OFDM) symbol and at the same time, transmitting, to a user equipment, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for the DL data channel (PDSCH) transmission/reception or the UL data channel (PUSCH) transmission/reception in the slot or the mini-slot; and

transmitting, to the user equipment, control information selecting one of the symbol allocation information included in the time-domain resource configuration information.

2. The method according to claim 1, wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

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3. The method according to claim 2, wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols and one or more lengths.

4. The method according to claim 2, wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling.

5. The method according to claim 2, wherein the transmitting of the control information to the user equipment is performed by transmitting the control information including information indicating one of the indexes to the user equipment.

6. The method according to claim 5, wherein the control information is DL assignment DL control information, and

wherein the transmitting of the control information to the user equipment is performed by transmitting the DL assignment DL control information including information indicating one

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of the indexes to the user equipment through a DL control channel.

7. The method according to claim 1, wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

8. The method according to claim 7, wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths.

9. The method according to claim 7, wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling.

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10. The method according to claim 7, wherein the transmitting of the control information to the user equipment is performed by transmitting the control information including information indicating one of the indexes to the user equipment.

11. The method according to claim 1, wherein the control information is UL grant DL control information, and

wherein the transmitting of the control information to the user equipment is performed by transmitting the UL grant DL control information including information indicating one of the indexes to the user equipment through a DL control channel.

12. A method of a user equipment for allocating a time-domain resource for downlink (DL) data channel (PDSCH) transmission/reception or uplink (UL) data channel (PUSCH) transmission/reception, the method comprising:

allocating the time-domain resource based on a slot or a mini-slot as a unit of an orthogonal frequency division multiplexing (OFDM) symbol and at the same time, receiving, from a base station, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for the DL data channel (PDSCH) transmission/reception or the UL data channel (PUSCH) transmission/reception in the slot or the

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mini-slot; and

receiving, from the base station, control information selecting one of the symbol allocation information included in the time-domain resource configuration information.

13. The method according to claim 12, wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

14. The method according to claim 13, wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols and one or more lengths.

15. The method according to claim 13, wherein the receiving of the time-domain resource configuration information from the base station is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception by the base station to the user equipment through user

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equipment-specific high layer signaling.

16. The method according to claim 13, wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment.

17. The method according to claim 16, wherein the control information is DL assignment DL control information, and

wherein the receiving of the control information from the base station is performed by transmitting the DL assignment DL control information including information indicating one of the indexes by the base station to the user equipment through a DL control channel.

18. The method according to claim 12, wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

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19. The method according to claim 18, wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths.

20. The method according to claim 18, wherein the receiving of the time-domain resource configuration information from the base station is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception by the base station to the user equipment through user equipment-specific high layer signaling.

21. The method according to claim 18, wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment.

22. The method according to claim 12, wherein the control information is UL grant DL control information, and

wherein the receiving of the control information from the base station is performed by transmitting the UL grant DL control information including information indicating one of the

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indexes by the base station to the user equipment through a DL control channel.

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AMENDMENTS TO THE SPECIFICATION

In the Specification

Please **INSERT** the following paragraph under the title of the invention on page 1 as follows.

-- CROSS REFERENCE TO RELATED APPLICATIONS

This application is a National Stage Patent Application of PCT International Patent Application No. PCT/KR2017/012105 (filed on October 30, 2017) under 35 U.S.C. §371, which claims priority to Korean Patent Application Nos. 10-2016-0143013 (filed on October 31, 2016) and 10-2017-0140898 (filed on October 27, 2017), the teachings of which are incorporated herein in their entireties by reference.--

Please **AMEND** the paragraph [164] ~ [165] as follows.

~~[164] **CROSS-REFERENCE TO RELATED APPLICATION**~~

~~[165] If applicable, this application claims priority under 35 U.S.C §119(a) of Patent Application No. 10-2016-0143013, filed on October 31, 2016, and Patent Application No. 10-2017-0140898, filed on October 27, 2017, in Korea, the entire contents of which are incorporated herein by reference. In addition, this non-provisional application claims priorities in countries other than the U.S. for the same reason based on the Korean Patent Applications, the entire contents of which are hereby incorporated by reference.~~

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AMENDMENTS TO THE CLAIMS

1. (Original) A method of a base station for allocating a time-domain resource for downlink (DL) data channel (PDSCH) transmission/reception or uplink (UL) data channel (PUSCH) transmission/reception, the method comprising:

allocating the time-domain resource based on a slot or a mini-slot as a unit of an orthogonal frequency-division multiplexing (OFDM) symbol and at the same time, transmitting, to a user equipment, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for the DL data channel (PDSCH) transmission/reception or the UL data channel (PUSCH) transmission/reception in the slot or the mini-slot; and

transmitting, to the user equipment, control information selecting one of the symbol allocation information included in the time-domain resource configuration information.

2. (Original) The method according to claim 1, wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

3. (Original) The method according to claim 2, wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols and one or more lengths.

4. (Original) The method according to claim 2, wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling.

5. (Original) The method according to claim 2, wherein the transmitting of the control information to the user equipment is performed by transmitting the control information including information indicating one of the indexes to the user equipment.

6. (Original) The method according to claim 5, wherein the control information is DL assignment DL control information, and

wherein the transmitting of the control information to the user equipment is performed by transmitting the DL assignment DL control information including information indicating one of the indexes to the user equipment through a DL control channel.

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7. (Original) The method according to claim 1, wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

8. (Original) The method according to claim 7, wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths.

9. (Original) The method according to claim 7, wherein the transmitting of the time-domain resource configuration information to the user equipment is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception to the user equipment through user equipment-specific high layer signaling.

10. **(Canceled)**

11. **(Canceled)**

12. (Original) A method of a user equipment for allocating a time-domain resource for downlink (DL) data channel (PDSCH) transmission/reception or uplink (UL) data channel (PUSCH) transmission/reception, the method comprising:

allocating the time-domain resource based on a slot or a mini-slot as a unit of an orthogonal frequency division multiplexing (OFDM) symbol and at the same time, receiving, from a base station, time-domain resource configuration information including OFDM symbol allocation information for OFDM symbols used for the DL data channel (PDSCH) transmission/reception or the UL data channel (PUSCH) transmission/reception in the slot or the mini-slot; and

receiving, from the base station, control information selecting one of the symbol allocation information included in the time-domain resource configuration information.

13. (Original) The method according to claim 12, wherein for allocating the time-domain resource for the DL data channel (PDSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

14. (Original) The method according to claim 13, wherein the OFDM symbol allocation information for the DL data channel transmission/reception includes one or more starting OFDM symbols

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and one or more lengths.

15. (Original) The method according to claim 13, wherein the receiving of the time-domain resource configuration information from the base station is performed by transmitting the time-domain resource configuration information in the form of the table for the DL data channel (PDSCH) transmission/reception by the base station to the user equipment through user equipment-specific high layer signaling.

16. (Original) The method according to claim 13, wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment.

17. (Original) The method according to claim 16, wherein the control information is DL assignment DL control information, and

wherein the receiving of the control information from the base station is performed by transmitting the DL assignment DL control information including information indicating one of the indexes by the base station to the user equipment through a DL control channel.

18. (Original) The method according to claim 12, wherein for allocating the time-domain resource for the UL data channel (PUSCH) transmission/reception, the time-domain resource configuration information includes, in the form of a table, the OFDM symbol allocation information and indexes indicating each of the symbol allocation information for each user equipment.

19. (Original) The method according to claim 18, wherein the OFDM symbol allocation information for the UL data channel (PUSCH) transmission/reception includes one or more starting OFDM symbols and one or more lengths.

20. (Original) The method according to claim 18, wherein the receiving of the time-domain resource configuration information from the base station is performed by transmitting the time-domain resource configuration information in the form of the table for the UL data channel (PUSCH) transmission/reception by the base station to the user equipment through user equipment-specific high layer signaling.

21. (Original) The method according to claim 18, wherein the receiving of the control information from the base station is performed by transmitting the control information including information indicating one of the indexes by the base station to the user equipment.

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22. (Original) The method according to claim 12, wherein the control information is UL grant DL control information, and

wherein the receiving of the control information from the base station is performed by transmitting the UL grant DL control information including information indicating one of the indexes by the base station to the user equipment through a DL control channel.

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REMARKS

Claims 1-22 were previously pending in the application. By this amendment, the specification is amended to claim priority and claims 10-11 are cancelled without prejudice or disclaimer. Assuming the entry of this amendment, claims 1-9 and 12-22 are now pending in the application. Applicant respectfully submits that no new matter is added and the support for the amendments may be found throughout the specification as originally filed.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided. Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

Date: 29 April 2019
Customer No. 76277
IP Legal Services, LLC
P.O. Box 651325
Sterling, VA 20165

/Ian M. Hughes/
Ian M. Hughes, Reg. No. 41,083
Joung Kook Park, Reg. No. 69,192
Attorney/Agent for Applicant
(571) 267-7183 (phone)

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