PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference NC101437WO	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/FI2017/050343	International filing date *(day/month/year)* 04 May 2017 (04.05.2017)	Priority date *(day/month/year)* 12 May 2016 (12.05.2016)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant NOKIA TECHNOLOGIES OY		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 13 November 2018 (13.11.2018)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Simin Baharlou e-mail: pct.team9@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
NOKIA TECHNOLOGIES OY
Ari Aarnio IPR Department
Karakaari 7
FI-02610 Espoo
FINLAND

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	17 August 2017 (17.08.2017)
Applicant´s or agent´s file reference	NC101437WO
FOR FURTHER ACTION	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/FI2017/050343	04 May 2017 (04.05.2017)	12 May 2016 (12.05.2016)

International Patent Classification (IPC) or both national classification and IPC
See supplemental box

Applicant
NOKIA TECHNOLOGIES OY

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [x] Box No. VII Certain defects in the international application
- [x] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/FI	Date of completion of this opinion	Authorized officer
Finnish Patent and Registration Office P.O. Box 1160, FI-00101 HELSINKI, Finland	15 August 2017 (15.08.2017)	Harald Kaaja
Facsimile No. +358 29 509 5328		Telephone No. +358 29 509 5000

Form PCT/ISA/237 (cover sheet) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/FI2017/050343

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

ASUS EX2019-p.3
Samsung v. ASUS
IPR2024-00614

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/FI2017/050343

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	---	YES
	Claims	1-28	NO
Inventive step (IS)	Claims	---	YES
	Claims	1-28	NO
Industrial applicability (IA)	Claims	1-28	YES
	Claims	---	NO

2. Citations and explanations:

2.1 Documents cited

Reference is made to the following documents:

D1: US 2011310833 A1 (LEE OK-SEON [KR] et al.) 22 December 2011 (22.12.2011),
D2: 3GPP, Report of 3GPP TSG RAN WG2 meeting #91. R2-154032, In: [online], 2015-10-09, [retrieved on 2017-08-15].
D3: US 2012230232 A1 (JI HYOUNGJU [KR] et al.) 13 September 2012 (13.09.2012),
D4: 3GPP, Nokia, Alcatel-Lucent Shanghai Bell: Skipping empty BSR and feedback for SPS activation/ deactivation. R2-162504, In: [online], 2016-04-02, [retrieved on 2017-08-15].
D5: 3GPP, Samsung: Skipping uplink transmission with no data to transmit. R2-153332, In: [online], 2015-08-14, [retrieved on 2017-08-15].

2.2 Claimed invention

The application concerns an invention defined in claims 1-28.

The invention generally relates to wireless or mobile communications networks, and also to methods and apparatuses for possibly skipping transport block (TB) transmission depending on uplink control information (UCI) transmission.

The invention is claimed as a method (**claims 1, 18**), as an apparatus **(claims 8, 16, 22, 26),** and a computer program (**claim 28**). The preferred embodiments of the invention are defined in dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27.

The aim of this invention is to reduce latency and save power, improving the functioning of communications networks and their nodes.

Independent claim 1 defines a method, comprising:
- (**F1**): receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission when there is no uplink data; and
- (**F2**): determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant.

Independent claim 8 defines an apparatus comprising at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least comprising the method (with features **F1-F2**) according to **independent claim 1**.

Independent claim 16 defines an apparatus comprising means for performing a method (with features **F1-F2**) according to **independent claim 1**.

Continued to next page

ASUS EX2019-p.4
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (1 / 4)

Independent claim 18 defines a method, comprising:
- (**F3**): transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and
- **(F4)**: receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

Independent claim 22 defines an apparatus comprising at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least comprising the method (with features **F3-F4**) according to **independent claim 18**.

Independent claim 26 defines an apparatus comprising means for performing a method (with features **F3-F4**) according to **independent claim 18**.

Independent claim 28 defines a computer program, embodied on a non-transitory computer readable medium, wherein the computer program is configured to control a processor to perform a method according to any one of **claims 1-7 or 18-21.**

All patent claims were subjected to a novelty search.

2.3 Novelty under PCT Article 33(2)

2.3.1 Independent claims

Documents D1 represents the most relevant prior art and documents D2-D5 represents the general state of the art.

Document D1 is regarded as the closest prior art (the references given below in parentheses relate to this document).

D1 relates to (Abstract) a system and a method minimizing power consumption, signalling overhead, and processing load in blind scheduling in a mobile communication system. A User Equipment (UE) detects a type of an uplink (UL) grant while it is periodically allocated the UL grant. If there is no data to transmit using the UL grant, the UE determines whether to transmit a padding Medium Access Control (MAC) Protocol Data Unit (PDU) to an Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Node B (eNB) using the UL grant according to the type of the UL grant.

Document D2 is related (in particular chapter 7.11) to meeting report including study on latency reduction techniques for LTE, e.g., discussions of skipping uplink transmission with no data to transmit.

Document D3 (The whole document) describes a flexible Time Division Duplex (TDD) method and apparatus for improving efficiency of communication system. A communication method of a base station supporting TDD includes transmitting, to a terminal, first information including at least one of a flag indicating whether flexible subframes are used and an indicator indicating a candidate flexible subframe set to an uplink subframe; transmitting, to the terminal, second information including a switch flag indicating whether to use the candidate flexible subframe as a downlink subframe; and transmitting, to the terminal, when the candidate flexible subframe is indicated to be used as the downlink subframe, the candidate flexible subframe as the downlink subframe.

Document D4 (The whole document) relates skipping empty BSR and feedback for SPS activation/ deactivation.

Document D5 (The whole document) relates skipping uplink transmission with no data to transmit.

D1 discloses the following technical features (F1-F2) of **claim 1**:

(**F1**): receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission

Continued to next page

ASUS EX2019-p.5
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (2 / 4)

when there is no uplink data; and (paragraphs [0013]-[0017], [0020], [0046]-[0054], figures 2, 6, 12), "… allocating an uplink (UL) grant to a user equipment (UE) using Semi-Persistent Scheduling (SPS). And when no data is detected from the UL grant, it is determined that the **UE transmits no data using the UL grant**…", "…The UE includes a control unit that determines whether there is data to transmit using an uplink (UL) grant…", "…If the UE has no data to transmit using the Explicit UL grant, the UE ends its process….." and also "…The Configured UL grant represents **a UL grant that is allocated to a UE** that has **received** a separate SPS **configuration Information Element** (IE)…". This corresponds to the feature **F1 of independent claim 1**.

(**F2**): determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant; (paragraphs [0017]-[0021], [0046]-[0052]), "…The UE includes a control unit detects a type of an uplink (UL) grant while the UE is periodically allocated a UL grant…The transmission unit transmits Hybrid Automatic Retransmission Request (HARQ) feedback information to a user equipment (UE) under specific control. And the control unit determines whether data is detected from the FAS grant, controlling the resource allocation unit to allocate a new FAS grant to the UE when no data is detected from the FAS grant, and controls the transmission unit to transmit HARQ feedback information to the UE…" and "…determined in block 119 that the UE has data to transmit using the Configured UL grant, the UE transmits the data using the Configured UL grant in block 123, and then ends the process…". This corresponds to the feature **F2 of independent claim 1**.

D1 discloses the following technical features (F3-F4) of **claim 18**:

(**F3**): transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and (paragraphs [0054]-[0055], figures 2, 11), "…an eNB 213 sets a value of a New Data Indicator (NDI) for a Hybrid Automatic Retransmission Request (HARQ) process x to '0', and allocates an Explicit UL grant for the HARQ process x to a UE 211 in an n-th frame in step 215. … In step 217, the UE 211 performs no operation because it has no data to transmit on a UL in (n+4)-th frame. That is, because the type of a UL grant is an Explicit UL grant, the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL…". This corresponds to the feature **F3 of independent claim 18**.

(**F4**): receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.(paragraphs [0046]-[0055], [0080]-[0081], figures 1-2, 11), "…the UE determines if it has data to transmit using the Configured UL grant. If the UE has no data to transmit using the Configured UL grant, the UE transmits padding MAC PDUs using the Configured UL grant in block 121, and then ends the process….the eNB 213 sets a value of the NDI to '1' and allocates an Explicit UL grant for the HARQ process x to the UE 211 in an (n+8)-th frame in step 219. When having data to transmit on a UL, the UE 211 transmits the data using the Explicit UL grant in an (n+12)-th frame in step 221…" and also "…The eNB determines a UL grant mapped to a FAS C-RNTI taking into account the Modulation and Coding Scheme (MCS) level, the Transport Block (TB) size, the number of Radio Bearers (RBs), and such…". This corresponds to the feature **F4 of independent claim 18**.

In summary: **Document D1** discloses all the features set forth in **independent claims 1 and 18.** Thus, the subject matter of claims 1 and 18 is not novel. The same reasoning applies, mutatis mutandis, to the subject matter of the corresponding **independent claims 8, 16, 22, 26 and 28,** which therefore is not considered novel, either.

Continued to next page

Supplemental Box

Continuation of: Box V (3 / 4)

2.3.2 Dependent claims

The additional features set forth in **dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27** are anticipated by **D1 :**

- **Claims 2, 5: D1** discloses (paragraphs [0015], [0046]-[0054], figures 1-2) " ...The blind scheduling method includes **determining whether there is data to transmit using an uplink (UL) grant**, while the UE is periodically allocated the UL grant....", "...if it is determined ... the UE has data to transmit using the Explicit UL grant, the UE transmits the data using the Explicit UL grant in block 117.... If it is determined ... the detected type of the UL grant is not an Explicit UL grant but a Configured UL grant, ... The Configured UL grant represents a UL grant that is allocated to a **UE that has received a separate SPS configuration Information Element (IE)** such as an SPS C-RNTI. Resource allocation information regarding the Configured UL grant is transmitted using a PDCCH, and once allocated, a transmission resource is valid until it is released or changed....when having no data to transmit on a UL, the **UE determines whether to transmit padding MAC PDUs according to the type of a UL grant.** If the type of the UL grant is an Explicit UL grant, **the UE transmits no padding MAC PDUs when it has no data to transmit on a UL**...." and also "...In block 119, the UE determines if it has data to transmit using the Configured UL grant. If the UE has no data to transmit using the Configured UL grant, the UE transmits padding MAC PDUs using the Configured UL grant in block 121, and then ends the process...". The UE receives UL grant from the eNB. The same holds **for dependent claims 9 and 12.** Therefore, the subject matter of **dependent claims 2, 5, 9 and 12** is not novel.

- **Claim 3: document D1** discloses (paragraphs [0040]-[0042], [0054]) " ...if a User Equipment (UE) being periodically allocated a dedicated uplink (UL) resource has no data to transmit on a UL, the UE **determines whether** to transmit **padding** Medium Access Control (MAC) **Protocol Data Units** (PDUs) according to the type of the allocated dedicated UL resource.....", "...the UE 211 performs no operation because it has no data to transmit on a UL in (n+4)-th frame. That is, because the type of a UL grant is an Explicit UL grant, the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL...". This also implicitly means that generating transport block is skipped. The same holds **for dependent claim 10.** Therefore, the subject matter of **dependent claims 3 and 10** is not novel.

- **Claim 4: D1** discloses(paragraphs [0063]-[0066], figure 4) " ...the UE 211 determines in block 411 whether **HARQ feedback information** is received from the eNB 213...the UE 211 determines in block 425 whether the received HARQ feedback information is a HARQ ACK. If the received HARQ feedback information is not a HARQ ACK but a HARQ NACK, the UE 211 initializes a retransmission process of the HARQ process being performed on the previously transmitted data in block 427. However, if it is determined in block 425 that the received HARQ feedback information is a HARQ ACK, the UE 211 proceeds to block 417... Even though the UE transmits no padding MAC PDUs, the HARQ process **between the UE and the eNB** may be normally performed.....". The same holds **for dependent claims 11, 19 and 23.** Therefore, the subject matter of **dependent claims 4, 11, 19 and 23** is not novel.

- **Claims 6, 20: D1** discloses (paragraphs [0054]-[0055], figures 1-2) " ...**eNB 213 sets** a value of a New Data Indicator (NDI) for a Hybrid Automatic Retransmission Request (HARQ) process x to '0', and **allocates an Explicit UL grant for the HARQ process x to a UE** 211 in an n-th frame in step 215. ... Because the eNB 213 has received no data from the UE 211 even though it allocated the Explicit UL grant in the n-th frame, the eNB 213 sets a value of the NDI to '1' and allocates an Explicit UL grant for the HARQ process x to the UE 211...". The same holds **for dependent claims 13 and 24.** Therefore, the subject matter of **dependent claims 6, 13, 20 and 24** is not novel.

- **Claim 7: D1** discloses (paragraphs [0018]-[0019], [0026], [0032], [0058], figures 3, 9, 11) "... The eNB includes a resource allocation unit that allocates an Explicit Uplink (UL) grant under specific control....", " ...**the eNB 213 determines** in block 311 whether data is detected from an allocated Explicit UL grant..." and also "...the eNB includes a control unit 1111, a resource allocation unit 1113, a transmission unit 1115, and a reception unit 1117....". The same holds **for dependent claims 14, 21 and 25.** Therefore, the subject matter of **dependent claims 7, 14, 21 and 25** is not novel.

- **Claim 15: D1** discloses(paragraphs [0017], [0116]-[0119]) " ...a user equipment (UE) for a mobile communication system. The UE includes a control unit detects a type of an uplink (UL) grant while

Continued to next page

ASUS EX2019-p.7
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (4 / 4)

the UE is periodically allocated a UL grant.....” and also “...the UE includes a control unit 1211, a transmission unit 1213, and a reception unit 1215...”. Therefore, the subject matter of **dependent claim 15** is not novel.

- **Claim 17: D1** disclose methods according to any of **claims 2-7** for an apparatus according to claim 16, therefore, the subject matter of **dependent claim 17** is not novel.

- **Claim 27: D1** disclose methods according to **claims 19, 20** for an apparatus according to claim 26, therefore, the subject matter of **dependent claim 27** is not novel.

As a summary, D1 discloses the additional features of **dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27.** Therefore, the subject matter of dependent claims **2-7, 9-15, 17, 19-21, 23-25 and 27** is not novel.

2.4 Inventive step under PCT Article 33(3)

2.4.1 Independent claims
The subject matter of independent **claims 1, 8, 16, 18, 22, 26 and 28** is not novel and therefore it does not involve an inventive step over the prior art.

2.4.2 Dependent claims

The subject matter of **dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27** is not novel and therefore it does not involve an inventive step over the prior art.

2.5 Industrial applicability under PCT Article 33(4)

Claims 1-28 meet the requirement of industrial applicability because the claimed subject matter can be made or used in industry.

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims are not drafted in the two-part form in accordance with PCT Rule 6.3(b), which in the present case would be appropriate, with those features known from the prior art placed in the preamble (PCT Rule 6.3(b)(i)) and the remaining features included in the characterising part (PCT Rule 6.3(b)(ii)).

The features of the claims are not provided with reference signs placed in parentheses (PCT Rule 6.2(b)).

To meet the requirements of PCT Rule 5.1(a)(ii), the most relevant prior art, i.e. document D1, should be referred to and briefly discussed in the introductory part of the description, preferably so that the inventive merit of the claimed invention can be easily understood.

ASUS EX2019-p.9
Samsung v. ASUS
IPR2024-00614

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/FI2017/050343

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Although claims 8 and 16, 22 and 26 have been drafted as separate independent claims, they seem to relate effectively to the same subject matter and to differ from each other only with regard to the definition of the subject matter for which protection is sought and in respect of the terminology used for the features of that subject matter. The above claims therefore lack conciseness and as such do not meet the requirements of PCT Article 6.

ASUS EX2019-p.10
Samsung v. ASUS
IPR2024-00614

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**

Continuation of: International Patent Classification (IPC)

IPC
H04W 72/12 (2009.01)
H04W 72/04 (2009.01)
H04W 24/02 (2009.01)

ASUS EX2019-p.11
Samsung v. ASUS
IPR2024-00614

PTO-1390 (01-18)
Approved for use through 8/31/2019. OMB 0651-0021
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.

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371

Attorney Docket No.	U.S. Application No. (if known, see 37 CFR 1.5)
NC101437-US-PCT	Not Yet Assigned

International Application No.	International Filing Date	Priority Date Claimed
PCT/FI2017/050343	May 4, 2017	May 12, 2016

Title of Invention
METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

First Named Inventor
Chunli WU

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☐ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☒ is attached.
   b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☒ A preliminary amendment.
11. ☒ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☒ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821-1.825 (not required if sequence listing in text format was indicated on the PCT Request as part of the International Application and the sequence listing was published as part of the international application).
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: _____
16. ☒ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. 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 15 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: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. APPLN. No. (if known – see 37 CFR 1.5)	INTERNATIONAL APPLICATION No.	ATTORNEY DOCKET No.
Not Yet Assigned	PCT/FI2017/050343	NC101437-US-PCT

17. ☐ Other items or information:

The following fees have been submitted.	CALCULATIONS
18. ■ Basic national fee (37 CFR 1.492(a)) **$300**	$ 300.00
19. ■ Examination fee (37 CFR 1.492(c)) • If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)..... **$0** • All other situations **$760**	$ 760.00
20. ■ Search fee (37 CFR 1.492(b)) • If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)..... **$0** • Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority ..... **$140** • International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB..... **$520** • All other situations **$660**	$ 520.00
TOTAL OF 18, 19, and 20 =	$ 1580.00

☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)).

Fee for each additional 50 sheets of paper or fraction thereof **$400**

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round **up** to a whole number)	RATE	
- 100 =	/ 50 =		x **$400**	$

Surcharge for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h))..... **$140**	$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	- 20 =		x **$100**	$
Independent claims	4 - 3 =	1	x **$460**	$ 460.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			**+ $820**	$

Fee for submission of Sequence Listing text file of 300 MB to 800 MB (37 CFR 1.21(o)(1))..... **$1,000**	$
Fee for submission of Sequence Listing text file of more than 800 MB (37 CFR 1.21(o)(2))..... **$10,000**	$
Processing fee for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i))..... **$140 +**	$
TOTAL OF ABOVE CALCULATIONS =	$
☐ **Applicant asserts small entity status.** See 37 CFR 1.27. Fees above are reduced by ½.	
☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.	
TOTAL NATIONAL FEE =	$ 2040.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31)..... **$50.00** per property **+**	$
TOTAL FEES ENCLOSED =	$ 2040.00

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 50-0270 in the amount of $ 2040.00 to cover the above fees.

c. ☒ The Director is hereby authorized to charge additional fees which may be required, or credit any overpayment, to Deposit Account No. 50-0270 as follows:

i. ☒ any required fee.

ii. ☐ any required fee except for excess claims fees required under 37 CFR 1.492(d) and (e) and multiple dependent claim fee required under 37 CFR 1.492(f).

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

ADVISORY: If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is **not** recommended and by doing so your **credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

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 1: 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**.

NOTE 2: A U.S. national stage application may not claim priority to the international application of which it is the national phase. The filing date of a U.S. national stage application is the international filing date. See 35 U.S.C. 363.

Correspondence Address

☐ The address associated with Customer Number: _____ **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone			
Email					

Signature	/Nico van Waes/	Date	November 6, 2018
Name (Print/Type)	Nico van Waes	Registration No. (Attorney/Agent)	61828

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.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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
	Chunli		WU	

Residence Information (Select One) US Residency ● Non US Residency Active US Military Service

City	Beijing	Country of Residence [i]	CN

Mailing Address of Inventor:

Address 1	No.1 Wangjing East Road		
Address 2	Chaoyang District		
City	Beijing	**State/Province**	
Postal Code	100096	**Country** [i]	CN

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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	73658		
Email Address	ipr.inhouse@nokia.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION		
Attorney Docket Number	NC101437-US-PCT	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		**Suggested Figure for Publication (if any)**	

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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	73658		

Domestic Benefit/National Stage Information:

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

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	a 371 of international	PCT/FI2017/050343	2017-05-04

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
PCT/FI2017/050343	Claims benefit of provisional	62/335280	2016-05-12
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)
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.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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	Nokia Technologies Oy		
Mailing Address Information For Applicant:			
Address 1	Karaportti 3		
Address 2			
City	Espoo	**State/Province**	
Country	FI	Postal Code	02610
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)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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	/Nico van Waes/			Date (YYYY-MM-DD)	2018-11-06
First Name	Nico	Last Name	Van Waes	Registration Number	61828

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

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NC101437-US-PCT
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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

First Named Inventor: Chunli WU		§	Docket No.:	NC101437-US-PCT
		§		
Serial No.:	Not Yet Assigned	§	I.A. Application No.:	PCT/FI2017/050343
		§		
Filed:	Herewith	§	I.A. Filing Date:	May 4, 2017
		§		
Conf. No.:	Not Yet Assigned	§		

Title: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

Commissioner for Patents
Mail Stop: Amendment
PO Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Dear Sir or Madam:

Prior to examination, please amend the above-identified application as follows.

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

Amendments to the Claims begin on **page 3** of this paper.

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

In the Specification

On Page 1 of the Specification, after the Title of Invention, please add the following section.

RELATED APPLICATION

This application was originally filed as PCT Application No. PCT/FI2017/050343 on May 4, 2017, which claims priority from US application 62/335280, filed May 12, 2016.

Listing of the Claims

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

Claims 1.-28. (Canceled)

29. (New) A method, comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission when there is no uplink data; and

determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant.

30. (New) The method according to claim 29, wherein, when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with uplink grant, generating a transport block regardless of whether there is uplink data to be transmitted.

31. (New) The method according to claim 29, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, skipping generating a transport block.

32. (New) The method according to claim 29, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback.

33. (New) The method according to claims 29, further comprising transmitting a transport block to the network node regardless of whether there is uplink data to be transmitted.

34. (New) The method according to claim 29, further comprising receiving the uplink grant from the network node.

35. (New) An apparatus, comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission when there is no uplink data; and

determine whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant.

36. (New) The apparatus according to claim 35, wherein, when it is determined that the apparatus is requested for the uplink control information transmission for the subframe with uplink grant, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted.

37. (New) The apparatus according to claim 35, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

38. (New) The apparatus according to claim 35, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback.

39. (New) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted.

40. (New) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

41. (New) The apparatus according to claim 35, wherein the network node comprises a base station or evolved node B.

42. (New) The apparatus according to claim 35, wherein the apparatus comprises a user equipment.

43. (New) A method, comprising:

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and

receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

44. (New) The method according to claim 43, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback.

45. (New) The method according to claim 43, further comprising transmitting uplink grant to the at least one user equipment.

46. (New) An apparatus, comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to

transmit a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and

receive, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

47. (New) The apparatus according to claim 46, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback.

48. (New) The apparatus according to claim 46, wherein the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to transmit uplink grant to the at least one user equipment.

Remarks

Claims 1-28 have been cancelled. Claims 29-48 have been added. No new matter has been added. An early formal notice of allowance of claims is respectfully requested. Examiner is invited to contact the undersigned with any questions.

Please charge any deficiency or credit any overpayment that may be due in this matter to Deposit Account Number 50-0270.

Respectfully submitted,

/Nico van Waes/

Nico van Waes
Patent Agent
Registration No. 61828
Cell: 214 499 2606

Date: Nov 6, 2018

Nokia USA Inc.
Attn: Intellectual Property Rights Docketing
200 South Mathilda Ave
Sunnyvale, CA 94086

Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the following standardized wording provided for in Section 214: see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.

Declaration of inventorship (Rules 4.17(iv) and 51*bis*.1(a)(iv)) for the purposes of the designation of the United States of America:

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

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/ F12017/050343 (if furnishing declaration pursuant to Rule 26*ter*).

I hereby declare that the above-identified international application was made or authorized to be made by me.

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.

Name: Wu, Chunli

Residence: Beijing, China
(city and either US state, if applicable, or country)

Mailing Address: 12-5-301, Huihuayuan, Huilongguan, Changping District

Beijing, 102208

China

Inventor's Signature: Chunli Wu Date: 2017.5.9
(The signature must be that of the inventor, not that of the agent)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Inventor's Signature: Date:
(The signature must be that of the inventor, not that of the agent)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Inventor's Signature: Date:
(The signature must be that of the inventor, not that of the agent)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

ASUS EX2019-p.30
Samsung v. ASUS
IPR2024-00614

PTO/AIA/80 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
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.

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: 73658

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: 73658

OR

☐	Firm or Individual Name			
	Address			
	City		State	Zip
	Country			
	Telephone		Email	

Assignee Name and Address: Nokia Technologies Oy
Karaportti 3
Espoo 02610
Finland

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	November 6, 2018
Name	Nico van Waes / Louis Diep	Telephone	214-499-2606
Title	Head of Technology Areas Patenting Radio Standards and User Experience / Director Filing & Prosecution Administration		

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.

NOKIA

Power of Attorney

WE, THE UNDERSIGNED, on behalf of NOKIA TECHNOLOGIES OY, (the "Company"), a company incorporated in Finland under Business Identity Code 2655044-9 whose registered office is at Karaportti 3, 02610 Espoo, Finland DO HEREBY AUTHORIZE the following persons to represent the Company strictly in accordance to both the pro-tempore Company's Level of Authority as well as any other relevant Company's policy, as the case may be, and to jointly sign any sales, sourcing and other agreements on behalf of the Company as specified herein, however always excluding and notwithstanding anything stated in this Power of Attorney, any guarantee, bond or similar instrument, or any financing agreement of whatsoever nature.

Following persons can, any two jointly, sign any Intellectual Property Rights ("IPR") related matters on behalf of the Company such as filing, prosecution and registration of patent, trademark and utility model applications, as well as the pertinent oral proceedings, novelty declarations and inventorship declarations, as well as any agreements on intellectual property rights, their creation, protection and prosecution and the granting of rights under them, including, but not limited to, non-disclosure agreements, assignment deeds, etc. (the "Documents") to:

(i) negotiate, sign and execute the Documents; and

(ii) execute all deeds, instruments, documents and agreements; to approve any amendment, alliteration or modification to any of the Documents or any of such deeds, instruments, documents and agreements and the sealing, signing or execution thereof or a copy thereof be conclusive evidence of such approval; and

(iii) take such other actions necessary, advisable or proper thereof including, without limitation, any action required to carry out the intent and purpose of the Documents.

Adrien Renoult

Alastair Black

Alex Yip

NOKIA

Alexander Schabel

Andrew Walker

Anne Ojanperä

Ari Aarnio

Arttu Uusitalo

Bernd Schaar

Claire Andrews

David Alexander Sarup

Dhiren Patel

Domenico Menzietti

Emmanuelle Wetzel

Gary Savitt

Gerhard Stortz

Gerry Gutowski

Gordon Huang

Gottfried Weidel

Harri T. Honkasalo

Jérôme Mouney

John F. McCabe

John Granchelli

John Kolakowski

John Samuels

NOKIA

Josiane El Manouni

Kalle Moilanen

Kari Puranen

Karine Berthier

Katharine Donovan

Kerry Miller

Kirsi Schroderus

Liu Xin

Louis Diep

Manfred Goretzki

Marcel Van der Sluis

Mark Ick

Markus Borgstrom

Miika Tupala

Nico VanWaes

Peter Cucchiara

Peter Zimmermann

Rauni Kittila

Rolf Hofmaier

Steven R. Santema

Tommi Lehtinen

Walter Meyer

NOKIA

Wenzhu Wang

Yan Wang

The attorneys may delegate their authorities under the present PoA to external patent attorneys, patent agencies and law firms.

Notwithstanding the foregoing, the authorities granted under this power of attorney to any of the persons listed above shall be automatically revoked with immediate effect as of the moment such person is no longer employed by any of the companies in Nokia Group ("the Group Companies"). Group Company shall mean any company directly or indirectly owned by Nokia Corporation, registration number 0112038-9, with its registered office at Karaportti 3, 02610 Espoo, Finland.

This Power of Attorney shall be effective as of January 2, 2018 and remain valid until December 31, 2018 unless revoked earlier by the Company.

Signed and duly executed in Espoo, Finland on January 5, 2018.

NOKIA TECHNOLOGIES OY

Jan Sandström
Director, Legal & Compliance

Teemu Soininen
Director, Patent Licensing

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. 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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Nokia Technologies Oy

Application No./Patent No.: To Be Assigned Filed/Issue Date: Filing Concurrently Herewith

Titled: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

Nokia Technologies Oy, 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: _____ 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.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. 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.

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.

Signature	November 6, 2018 Date
Claire Andrews / Louis Diep Printed or Typed Name	Head of Tech. Area, Patenting / Director Filing & Pros. Admin. Title or Registration Number

NC101437

ASSIGNMENT

I/we, (The ASSIGNOR(S)):

Chunli Wu

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, hereby assign to (hereafter referred to as The ASSIGNEE):

Nokia Technologies OY
Karaportti 3
02610 Espoo
Finland

An invention entitled (invention Title):

METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

The PATENT RIGHTS referred to in this agreement are:

_	a national Patent Application No.	filed on
_	European Patent Application No.	filed on
X	PCT application No. **PCT/FI2017/050343** filed on **May 04, 2017**.	

for this invention, executed by the ASSIGNOR(S)

X	U.S. Patent Application Serial No. **62/335280** filed **May 12, 2016**.
_	U.S. Patent No. _____, issued _____

The PATENT RIGHTS assigned under this agreement are:

X	U.S. Patent rights
X	worldwide Patent rights. In this case, the assignee shall have the right to claim the benefit of the filing date of any Patent Application identified above.
X	the full and exclusive right to the invention;

The ASSIGNOR(S) do hereby assign the following to each ASSIGNEE; their successors and assigns:

an equal interest in and to the entire right, title and interest in and to the PATENT RIGHTS in the invention, all continuations, continuations-in-part, divisionals, re-issues, and re-examination patents and patent applications; and

the right to claim priority under 35 U.S.C. § 119, based on any earlier foreign applications for this invention.

As to all U.S. Patent Applications assigned under this Agreement, the ASSIGNOR(S) hereby authorize(s) and request(s) the Commissioner of Patents and Trademarks to issue all Letters Patent to the ASSIGNEE(S) as the ASSIGNEE(S) of an equal interest in the entire right, title and interest, for the sole use and enjoyment of said ASSIGNEE(S), their successors and assigns.

Further, the ASSIGNOR(S) agree(s) to communicate to said ASSIGNEE(S), or their representatives, any facts known to the ASSIGNOR(S) respecting said invention, and testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, substitute, renewal, reexamination and reissue applications, execute all necessary assignment papers to cause any and all Letters Patent to be issued to said ASSIGNEE(S), make all rightful oaths and generally do everything necessary or desirable to aid said ASSIGNEE(S), their successors and assigns, to obtain and enforced proper protection for said invention.

Further, I/We authorize the attorney of record to update this document to include Patent Office information as deemed necessary (i.e., filing date, serial number, etc.);

Each Inventor: Please sign and date below:

NC101437

Chunli Wu
[Chunli Wu]

2017.5.9
Date

Li Zhang
Witness Signature
Printed Name Li Zhang

2017.5.5
Date

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	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

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					

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	20110141928	A1	2011-06-16	Shin et al.	
	2	20150043352	A1	2015-02-12	Jang et al.	
	3	20110310833	A1	2011-12-22	Lee et al.	
	4	20120230232	A1	2012-09-13	Ji 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]

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

	1	2802187	EP	A1	2014-11-12	Innovative Sonic Corporation		

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

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	"Open Issues For Skipping UL Grants", 3GPP TSG-RAN2 Meeting #93bis, R2-162909, Agenda item: 8.8.2, Qualcomm Incorporated, April 12-16, 2016, 2 pages.	
	2	"3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)", 3GPP TS 36.212, V13.1.0, March, 2016, pp. 1-129.	
	3	"3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 13)", 3GPP TS 36.213, V13.1.1, March, 2016, pp. 1-361.	
	4	"3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Further advancements for E-UTRA physical layer aspects (Release 9)", 3GPP TR 36.814, V9.0.0, March, 2010, pp. 1-104.	
	5	International Search Report and Written Opinion received for corresponding Patent Cooperation Treaty Application No. PCT/FI2017/050343, dated August 17, 2017, 16 pages.	
	6	"Report of 3GPP TSG RAN WG2 meeting #91", 3GPP TSG-RAN Working Group 2 meeting #91bis, R2-154032, Agenda Item: 2.2, ETSI MCC, October 5–9, 2015, pp. 1-163.	
	7	"Skipping Empty BSR and Feedback for SPS Activation/Deactivation", 3GPP TSG-RAN WG2 Meeting #93bis, R2-162504, Agenda item: 8.8.2, Nokia, April 11-15, 2016, 8 pages.	
	8	"Skipping Uplink Transmission With No Data to Transmit", 3GPP TSG-RAN WG2 Meeting #91, R2-153332, Agenda Item: 7.11, Samsung, August 24-28, 2015, pp. 1-2.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

	9	"3rd Generation Partnership Project;Technical Specification Group Radio Access Network;Evolved Universal Terrestrial Radio Access (E-UTRA);Medium Access Control (MAC) protocol specification (Release 13) 3GPP TS 36.321 V13.1.0, March 2016, pages 33-36, 48-50 and 56-59.

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	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

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	/Nico van Waes/	Date (YYYY-MM-DD)	2018-11-06
Name/Print	Nico van Waes	Registration Number	61828

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.

Espacenet

Bibliographic data: EP2802187 (A1) — 2014-11-12

Method and Apparatus for Scheduling Request Operation of Small Cell Enhancements in a Wireless Communication System

Inventor(s): TSENG LI-CHIH [TW] ± (TSENG, LI-CHIH)

Applicant(s): INNOVATIVE SONIC CORP [TW] ± (INNOVATIVE SONIC CORPORATION)

Classification: - international: *H04W48/16; H04W72/12; H04W84/04*
- cooperative: **H04W24/02**; **H04W24/04**; **H04W72/04**; **H04W76/34**; H04W36/00; H04W36/0069; H04W84/045

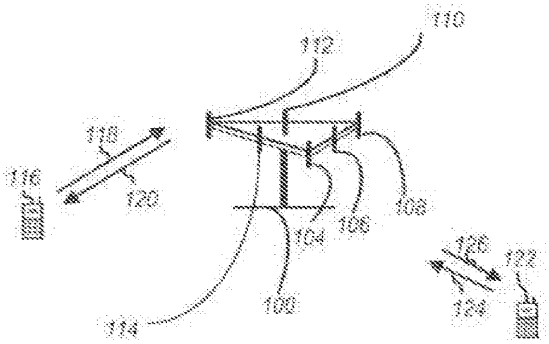
Application number: EP20140162778 20140331 Global Dossier

Priority number (s): US201361807103P 20130401

Also published as: CN104105108 (A) CN104105212 (A) EP2802175 (A1) EP2802185 (A2) EP2802185 (A3) more

Abstract of EP2802187 (A1)

Methods and apparatuses are disclosed for scheduling request operation in a small cell in a wireless communication system. The method includes having a user equipment (UE) configured with a first serving cell and a second serving cell. The method further includes configuring the (UE) with a first scheduling request (SR) resource on a first physical uplink control channel and a second SR resource on a second physical uplink control channel. The method includes selecting, by the UE, the first SR resource to start a SR procedure in response to a trigger by a buffer status report (BSR), wherein an availability of the first SR resource is nearer to a timing of a triggering of the BSR than the availability of the second SR resource. Also, the method includes sending, by the UE, scheduling requests with the first SR resource on the first physical uplink control channel.



ASUS EX2019-p.45
Samsung v. ASUS
IPR2024-00614

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 802 187 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
12.11.2014 Bulletin 2014/46

(51) Int Cl.:
H04W 84/04 *(2009.01)* ***H04W 72/12*** *(2009.01)*
H04W 48/16 *(2009.01)*

(21) Application number: **14162778.6**

(22) Date of filing: **31.03.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **01.04.2013 US 201361807103 P**

(71) Applicant: **Innovative Sonic Corporation**
Taipei City
10049 (TW)

(72) Inventor: **Tseng, Li-Chih**
10049 Zhongzheng Dist., Taipei City (TW)

(74) Representative: **Hoefer & Partner**
Pilgersheimer Straße 20
81543 München (DE)

(54) **Method and Apparatus for Scheduling Request Operation of Small Cell Enhancements in a Wireless Communication System**

(57) Methods and apparatuses are disclosed for scheduling request operation in a small cell in a wireless communication system. The method includes having a user equipment (UE) configured with a first serving cell and a second serving cell. The method further includes configuring the (UE) with a first scheduling request (SR) resource on a first physical uplink control channel and a second SR resource on a second physical uplink control channel. The method includes selecting, by the UE, the first SR resource to start a SR procedure in response to a trigger by a buffer status report (BSR), wherein an availability of the first SR resource is nearer to a timing of a triggering of the BSR than the availability of the second SR resource. Also, the method includes sending, by the UE, scheduling requests with the first SR resource on the first physical uplink control channel.

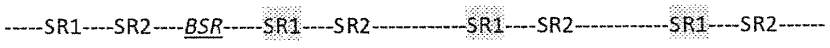


FIG. 5

EP 2 802 187 A1

ASUS EX2019-p.46
Samsung v. ASUS
IPR2024-00614

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present Application claims the benefit of U.S. Provisional Patent Application Serial No. 61/807,103 filed on April 1, 2013, the entire disclosure of which is incorporated herein by reference.

FIELD

[0002] This disclosure generally relates to wireless communication networks, and more particularly, to methods and apparatuses for small cell enhancement in a wireless communication system.

BACKGROUND

[0003] With the rapid rise in demand for communication of large amounts of data to and from mobile communication devices, traditional mobile voice communication networks are evolving into networks that communicate with Internet Protocol (IP) data packets. Such IP data packet communication can provide users of mobile communication devices with voice over IP, multimedia, multicast and on-demand communication services.

[0004] An exemplary network structure for which standardization is currently taking place is an Evolved Universal Terrestrial Radio Access Network (E-UTRAN). The E-UTRAN system can provide high data throughput in order to realize the above-noted voice over IP and multimedia services. The E-UTRAN system's standardization work is currently being performed by the 3GPP standards organization. Accordingly, changes to the current body of 3GPP standard are currently being submitted and considered to evolve and finalize the 3GPP standard.

SUMMARY

[0005] Methods and apparatuses are disclosed for scheduling request operation of a small cell in a wireless communication system and are defined in independent claims 1, 7, and 14, respectively. The respective dependent claims define preferred embodiments thereof, respectively. The method according to a first aspect includes having a user equipment (UE) configured with a first serving cell and a second serving cell. This method further includes configuring the (UE) with a first scheduling request (SR) resource on a first physical uplink control channel and a second SR resource on a second physical uplink control channel. This method includes selecting, by the UE, the first SR resource to start a SR procedure in response to a trigger by a buffer status report (BSR), wherein an availability of the first SR resource is nearer to a timing of a triggering of the BSR than the availability of the second SR resource. Also, this method includes sending, by the UE, scheduling requests with the first SR resource on the first physical uplink control channel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

FIG. 1 shows a diagram of a wireless communication system according to one exemplary embodiment.

FIG. 2 is a block diagram of a transmitter system (also known as access network) and a receiver system (also known as user equipment or UE) according to one exemplary embodiment.

FIG. 3 is a functional block diagram of a communication system according to one exemplary embodiment.

FIG. 4 is a functional block diagram of the program code of FIG. 3 according to one exemplary embodiment.

FIG. 5 is a diagram of scheduling request (SR) resource configuration according to one exemplary embodiment.

FIG. 6 is a diagram of scheduling request (SR) resource configuration according to one exemplary embodiment.

FIG. 7 is a diagram of scheduling request (SR) resource configuration according to one exemplary embodiment.

DETAILED DESCRIPTION

[0007] The exemplary wireless communication systems and devices described below employ a wireless communica-

ASUS EX2019-p.47
Samsung v. ASUS
IPR2024-00614

tion system, supporting a broadcast service. Wireless communication systems are widely deployed to provide various types of communication such as voice, data, and so on. These systems may be based on code division multiple access (CDMA), time division multiple access (TDMA), orthogonal frequency division multiple access (OFDMA), 3GPP LTE (Long Term Evolution) wireless access, 3GPP LTE-A or LTE-Advanced (Long Term Evolution Advanced), 3 GPP2 UMB (Ultra Mobile Broadband), WiMax, or some other modulation techniques.

[0008] In particular, the exemplary wireless communication systems devices described below may be designed to support one or more standards such as the standard offered by a consortium named "3rd Generation Partnership Project" referred to herein as 3GPP, including Document Nos. TS36.321 v11.2.0 (2013-03) entitled "E-UTRA; MAC protocol specification ," TR36.392 v12.0.0 (2012-12) entitled "Scenarios and Requirements for Small Cell Enhancements for E-UTRA and E-UTRAN," R2-130420 entitled "Protocol architecture alternatives for dual connectivity," TR 36.913, RP-122033 entitled "New Study Item Description: Small Cell enhancements for E-UTRA and E-UTRAN - Higher-layer aspects," and 3GPP R2-130570 entitled "Report of 3GPP TSG RAN WG2 meeting #72." The standards and documents listed above are hereby expressly incorporated by reference in their entirety.

[0009] FIG. 1 shows a multiple access wireless communication system according to one embodiment of the invention. An access network 100 (AN) includes multiple antenna groups, one including 104 and 106, another including 108 and 110, and an additional including 112 and 114. In FIG. 1, only two antennas are shown for each antenna group, however, more or fewer antennas may be utilized for each antenna group. Access terminal 116 (AT) is in communication with antennas 112 and 114, where antennas 112 and 114 transmit information to access terminal 116 over forward link 120 and receive information from access terminal 116 over reverse link 118. Access terminal (AT) 122 is in communication with antennas 106 and 108, where antennas 106 and 108 transmit information to access terminal (AT) 122 over forward link 126 and receive information from access terminal (AT) 122 over reverse link 124. In a FDD system, communication links 118, 120, 124 and 126 may use different frequency for communication. For example, forward link 120 may use a different frequency then that used by reverse link 118.

[0010] Each group of antennas and/or the area in which they are designed to communicate is often referred to as a sector of the access network. In the embodiment, antenna groups each are designed to communicate to access terminals in a sector of the areas covered by access network 100.

[0011] In communication over forward links 120 and 126, the transmitting antennas of access network 100 may utilize beamforming in order to improve the signal-to-noise ratio of forward links for the different access terminals 116 and 122. Also, an access network using beamforming to transmit to access terminals scattered randomly through its coverage causes less interference to access terminals in neighboring cells than an access network transmitting through a single antenna to all its access terminals.

[0012] An access network (AN) may be a fixed station or base station used for communicating with the terminals and may also be referred to as an access point, a Node B, a base station, an enhanced base station, an eNB, or some other terminology. An access terminal (AT) may also be called user equipment (UE), a wireless communication device, terminal, access terminal or some other terminology.

[0013] FIG. 2 is a simplified block diagram of an embodiment of a transmitter system 210 (also known as the access network) and a receiver system 250 (also known as access terminal (AT) or user equipment (UE)) in a MIMO system 200. At the transmitter system 210, traffic data for a number of data streams is provided from a data source 212 to a transmit (TX) data processor 214.

[0014] In one embodiment, each data stream is transmitted over a respective transmit antenna. TX data processor 214 formats, codes, and interleaves the traffic data for each data stream based on a particular coding scheme selected for that data stream to provide coded data.

[0015] The coded data for each data stream may be multiplexed with pilot data using OFDM techniques. The pilot data is typically a known data pattern that is processed in a known manner and may be used at the receiver system to estimate the channel response. The multiplexed pilot and coded data for each data stream is then modulated (i.e., symbol mapped) based on a particular modulation scheme (e.g., BPSK, QPSK, M-PSK, or M-QAM) selected for that data stream to provide modulation symbols. The data rate, coding, and modulation for each data stream may be determined by instructions performed by processor 230.

[0016] The modulation symbols for all data streams are then provided to a TX MIMO processor 220, which may further process the modulation symbols (e.g., for OFDM). TX MIMO processor 220 then provides N_T modulation symbol streams to N_T transmitters (TMTR) 222a through 222t. In certain embodiments, TX MIMO processor 220 applies beamforming weights to the symbols of the data streams and to the antenna from which the symbol is being transmitted.

[0017] Each transmitter 222 receives and processes a respective symbol stream to provide one or more analog signals, and further conditions (e.g., amplifies, filters, and upconverts) the analog signals to provide a modulated signal suitable for transmission over the MIMO channel. N_T modulated signals from transmitters 222a through 222t are then transmitted from N_T antennas 224a through 224t, respectively.

[0018] At receiver system 250, the transmitted modulated signals are received by N_R antennas 252a through 252r and the received signal from each antenna 252 is provided to a respective receiver (RCVR) 254a through 254r. Each

ASUS EX2019-p.48
Samsung v. ASUS
IPR2024-00614

receiver 254 conditions (e.g., filters, amplifies, and downconverts) a respective received signal, digitizes the conditioned signal to provide samples, and further processes the samples to provide a corresponding "received" symbol stream.

[0019] An RX data processor 260 then receives and processes the N_R received symbol streams from N_R receivers 254 based on a particular receiver processing technique to provide N_T "detected" symbol streams. The RX data processor 260 then demodulates, deinterleaves, and decodes each detected symbol stream to recover the traffic data for the data stream. The processing by RX data processor 260 is complementary to that performed by TX MIMO processor 220 and TX data processor 214 at transmitter system 210.

[0020] A processor 270 periodically determines which pre-coding matrix to use (discussed below). Processor 270 formulates a reverse link message comprising a matrix index portion and a rank value portion.

[0021] The reverse link message may comprise various types of information regarding the communication link and/or the received data stream. The reverse link message is then processed by a TX data processor 238, which also receives traffic data for a number of data streams from a data source 236, modulated by a modulator 280, conditioned by transmitters 254a through 254r, and transmitted back to transmitter system 210.

[0022] At transmitter system 210, the modulated signals from receiver system 250 are received by antennas 224, conditioned by receivers 222, demodulated by a demodulator 240, and processed by a RX data processor 242 to extract the reserve link message transmitted by the receiver system 250. Processor 230 then determines which pre-coding matrix to use for determining the beamforming weights then processes the extracted message.

[0023] Turning to FIG. 3, this figure shows an alternative simplified functional block diagram of a communication device according to one embodiment of the invention. As shown in FIG. 3, the communication device 300 in a wireless communication system can be utilized for realizing the UEs (or ATs) 116 and 122 in FIG. 1, and the wireless communications system is preferably the LTE system. The communication device 300 may include an input device 302, an output device 304, a control circuit 306, a central processing unit (CPU) 308, a memory 310, a program code 312, and a transceiver 314. The control circuit 306 executes the program code 312 in the memory 310 through the CPU 308, thereby controlling an operation of the communications device 300. The communications device 300 can receive signals input by a user through the input device 302, such as a keyboard or keypad, and can output images and sounds through the output device 304, such as a monitor or speakers. The transceiver 314 is used to receive and transmit wireless signals, delivering received signals to the control circuit 306, and outputting signals generated by the control circuit 306 wirelessly.

[0024] FIG. 4 is a simplified block diagram of the program code 312 shown in FIG. 3 in accordance with one embodiment of the invention. In this embodiment, the program code 312 includes an application layer 400, a Layer 3 portion 402, and a Layer 2 portion 404, and is coupled to a Layer 1 portion 406. The Layer 3 portion 402 generally performs radio resource control. The Layer 2 portion 404 generally performs link control. The Layer 1 portion 406 generally performs physical connections.

[0025] For LTE or LTE-A systems, the Layer 2 portion may include a Radio Link Control (RLC) layer and a Medium Access Control (MAC) layer. The Layer 3 portion may include a Radio Resource Control (RRC) layer.

[0026] In 3GPP TS36.321 v11.2.0, Scheduling Request (SR) operation with different Physical Uplink Control Channel resource is discussed as follows:

5.4.4 Scheduling Request

[0027] The Scheduling Request (SR) is used for requesting UL-SCH resources for new transmission.

[0028] When an SR is triggered, it shall be considered as pending until it is cancelled. All pending SR(s) shall be cancelled and *sr-ProhibitTimer* shall be stopped when a MAC PDU is assembled and this PDU includes a BSR which contains buffer status up to (and including) the last event that triggered a BSR (see subclause 5.4.5), or when the UL grant(s) can accommodate all pending data available for transmission.

[0029] If an SR is triggered and there is no other SR pending, the UE shall set the SR_COUNTER to 0.

[0030] As long as one SR is pending, the UE shall for each TTI:

- if no UL-SCH resources are available for a transmission in this TTI:
- if the UE has no valid PUCCH resource for SR configured in any TTI: initiate a Random Access procedure (see subclause 5.1) on the PCell and cancel all pending SRs;
- else if the UE has a valid PUCCH resource for SR configured for this TTI and if this TTI is not part of a measurement gap and if *sr-ProhibitTimer* is not running:
- if SR_COUNTER < *dsr-TransMax:*
- increment SR_COUNTER by 1;
- instruct the physical layer to signal the SR on PUCCH;
- start the *sr-ProhibitTimer.*
- else:
- notify RRC to release PUCCH/SRS for all serving cells;

ASUS EX2019-p.49
Samsung v. ASUS
IPR2024-00614

- clear any configured downlink assignments and uplink grants;
- initiate a Random Access procedure (see subclause 5.1) on the PCell and cancel all pending SRs.

5.4.5 Buffer Status Reporting

[0031] The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers *periodicBSR-Timer* and *retxBSR-Timer* and by, for each logical channel, optionally signalling *logicalChannelGroup* which allocates the logical channel to an LCG.

[0032] For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended.

[0033] A Buffer Status Report (BSR) shall be triggered if any of the following events occur:

- UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in 3GPP RP-122033 and 3GPP TS 36.300 V11.4.0 respectively) and either the data belongs to a logical channel with higher priority than the priorities of the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR";
- UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR";
- *retxBSR-Timer* expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR";
- *periodicBSR-Timer* expires, in which case the BSR is referred below to as "Periodic BSR".

[0034] For Regular and Periodic BSR:

- if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR;
- else report Short BSR.

[0035] For Padding BSR:

- if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader:
- if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission;
- else report Short BSR.
- else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.

[0036] If the Buffer Status reporting procedure determines that at least one BSR has been triggered and not cancelled:

- if the UE has UL resources allocated for new transmission for this TTI:
- instruct the Multiplexing and Assembly procedure to generate the BSR MAC control element(s);
- start or restart *periodicBSR-Timer* except when all the generated BSRs are Truncated BSRs;
- start or restart *retxBSR-Timer.*
- else if a Regular BSR has been triggered:
- if an uplink grant is not configured or the Regular BSR was not triggered due to data becoming available for transmission for a logical channel for which logical channel SR masking (*logicalChannelSR-Mask)* is setup by upper layers:
- a Scheduling Request shall be triggered.

ASUS EX2019-p.50
Samsung v. ASUS
IPR2024-00614

[0037] A MAC PDU shall contain at most one MAC BSR control element, even when multiple events trigger a BSR by the time a BSR can be transmitted in which case the Regular BSR and the Periodic BSR shall have precedence over the padding BSR.

[0038] The UE shall restart *retxBSR-Timer* upon indication of a grant for transmission of new data on any UL-SCH.

[0039] All triggered BSRs shall be cancelled in case the UL grant(s) in this subframe can accommodate all pending data available for transmission but is not sufficient to additionally accommodate the BSR MAC control element plus its subheader. All triggered BSRs shall be cancelled when a BSR is included in a MAC PDU for transmission.

[0040] The UE shall transmit at most one Regular/Periodic BSR in a TTI. If the UE is requested to transmit multiple MAC PDUs in a TTI, it may include a padding BSR in any of the MAC PDUs which do not contain a Regular/Periodic BSR.

[0041] All BSRs transmitted in a TTI always reflect the buffer status after all MAC PDUs have been built for this TTI. Each LCG shall report at the most one buffer status value per TTI and this value shall be reported in all BSRs reporting buffer status for this LCG.

[0042] NOTE: A Padding BSR is not allowed to cancel a triggered Regular/Periodic BSR. A Padding BSR is triggered for a specific MAC PDU only and the trigger is cancelled when this MAC PDU has been built.

5.7 Discontinuous Reception (DRX)

[0043] The UE may be configured by RRC with a DRX functionality that controls the UE's PDCCH monitoring activity for the UE's C-RNTI, TPC-PUCCH-RNTI, TPC-PUSCH-RNTI and Semi-Persistent Scheduling C-RNTI (if configured). When in RRC_CONNECTED, if DRX is configured, the UE is allowed to monitor the PDCCH discontinuously using the DRX operation specified in this subclause; otherwise the UE monitors the PDCCH continuously. When using DRX operation, the UE shall also monitor PDCCH according to requirements found in other subclauses of this specification. RRC controls DRX operation by configuring the timers *onDurationTimer, drx-InactivityTimer, drx-RetransmissionTimer* (one per DL HARQ process except for the broadcast process), the *longDRX-Cycle,* the value of the *drxStartOffset* and optionally the *drxShortCycleTimer* and *shortDRX-Cycle*. A HARQ RTT timer per DL HARQ process (except for the broadcast process) is also defined (see subclause 7.7).

[0044] When a DRX cycle is configured, the Active Time includes the time while:

- *onDurationTimer* or *drx-InactivityTimer* or *dre-RetransmissionTimer* or *mac-ContentionResolutionTimer* (as described in subclause 5.1.5) is running; or
- a Scheduling Request is sent on PUCCH and is pending (as described in subclause 5.4.4); or
- an uplink grant for a pending HARQ retransmission can occur and there is data in the corresponding HARQ buffer; or
- a PDCCH indicating a new transmission addressed to the C-RNTI of the UE has not been received after successful reception of a Random Access Response for the preamble not selected by the UE (as described in subclause 5.1.4).

[0045] When DRX is configured, the UE shall for each subframe:

- if a HARQ RTT Timer expires in this subframe and the data of the corresponding HARQ process was not successfully decoded:
- start the *drx-RetransmissionTimer* for the corresponding HARQ process.
- if a DRX Command MAC control element is received:
- stop *onDurationTimer;*
- stop *drx-InactivityTimer*.
- if *drx-InactivityTimer* expires or a DRX Command MAC control element is received in this subframe:
- if the Short DRX cycle is configured:
- start or restart *drxShortCycleTimer;*
- use the Short DRX Cycle.

ASUS EX2019-p.51
Samsung v. ASUS
IPR2024-00614

- else:
- use the Long DRX cycle.
- if *drxShortCycleTimer* expires in this subframe:
- use the Long DRX cycle.
- If the Short DRX Cycle is used and [(SFN * 10) + subframe number] modulo (*shortDRX-Cycle*) = (*drxStartOffset*) modulo (*shortDRX-Cycle);* or
- if the Long DRX Cycle is used and [(SFN * 10) + subframe number] modulo (*longDRX-Cycle) = drxStartOffset:*
- start *onDurationTimer.*
- during the Active Time, for a PDCCH-subframe, if the subframe is not required for uplink transmission for half-duplex FDD UE operation and if the subframe is not part of a configured measurement gap:
- monitor the PDCCH;
- if the PDCCH indicates a DL transmission or if a DL assignment has been configured for this subframe:
- start the HARQ RTT Timer for the corresponding HARQ process;
- stop the *drx-RetransmissionTimer* for the corresponding HARQ process.
- if the PDCCH indicates a new transmission (DL or UL):
- start or restart *drx-InactivityTimer.*
- in current subframe n, if the UE would not be in Active Time according to grants/assignments received until and including subframe n-4, type-0-triggered SRS (3GPP TR36.392 v12.0.0) shall not be reported.
- if CQI masking (*cqi-Mask*) is setup by upper layers:
- in current subframe n, if *onDurationTimer* would not be running according to grants/assignments received until and including subframe n-4, CQI/PMI/RI/PTI on PUCCH shall not be reported.
- else:
- in current subframe n, if the UE would not be in Active Time according to grants/assignments received until and including subframe n-4, CQI/PMI/RI/PTI on PUCCH shall not be reported.

[0046] Regardless of whether the UE is monitoring PDCCH or not, the UE receives and transmits HARQ feedback and transmits type-1-triggered SRS 3GPP TR36.392 v12.0.0 when such is expected.

[0047] NOTE: The same active time applies to all activated serving cell(s).

5.13 Activation/Deactivation of SCells

[0048] If the UE is configured with one or more SCells, the network may activate and deactivate the configured SCells. The PCell is always activated. The network activates and deactivates the SCell(s) by sending the Activation/Deactivation MAC control element described in subclause 6.1.3.8. Furthermore, the UE maintains a *sCellDeactivationTimer* timer per configured SCell and deactivates the associated SCell upon its expiry. The same initial timer value applies to each instance of the *sCellDeactivationTimer* and it is configured by RRC. The configured SCells are initially deactivated upon addition and after a handover. The UE shall for each TTI and for each configured SCell:

- if the UE receives an Activation/Deactivation MAC control element in this TTI activating the SCell, the UE shall in the TTI according to the timing defined in [2]:

ASUS EX2019-p.52
Samsung v. ASUS
IPR2024-00614

- activate the SCell; i.e. apply normal SCell operation including:
- SRS transmissions on the SCell;
- CQI/PMI/RI/PTI reporting for the SCell;
- PDCCH monitoring on the SCell;
- PDCCH monitoring for the SCell
- start or restart the *sCellDeactivationTimer* associated with the SCell;
- else, if the UE receives an Activation/Deactivation MAC control element in this TTI deactivating the SCell; or
- if the *sCellDeactivationTimer* associated with the activated SCell expires in this TTI:
- in the TTI according to the timing defined in 3GPP TR36.392 v12.0.0:
- deactivate the SCell;
- stop the *sCellDeactivationTimer* associated with the SCell;
- flush all HARQ buffers associated with the SCell.
- if PDCCH on the activated SCell indicates an uplink grant or downlink assignment; or
- if PDCCH on the Serving Cell scheduling the activated SCell indicates an uplink grant or a downlink assignment for the activated SCell:
- restart the *sCellDeactivationTimer* associated with the SCell;
- if the SCell is deactivated:
- not transmit SRS on the SCell;
- not report CQI/PMI/RI/PTI for the SCell;
- not transmit on UL-SCH on the SCell;
- not transmit on RACH on the SCell;
- not monitor the PDCCH on the SCell;
- not monitor the PDCCH for the SCell.

[0049] NOTE: When SCell is deactivated, the ongoing Random Access procedure on the SCell, if any, is aborted.

6.1.3.1 Buffer Status Report MAC Control Elements

[0050] Buffer Status Report (BSR) MAC control elements consist of either:

- Short BSR and Truncated BSR format: one LCG ID field and one corresponding Buffer Size field (figure 6.1.3.1-1); or
- Long BSR format: four Buffer Size fields, corresponding to LCG IDs #0 through #3 (figure 6.1.3.1-2).

[0051] The BSR formats are identified by MAC PDU subheaders with LCIDs as specified in table 6.2.1-2.
[0052] The fields LCG ID and Buffer Size are defined as follow:

- LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being

ASUS EX2019-p.53
Samsung v. ASUS
IPR2024-00614

reported. The length of the field is 2 bits;

- Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after all MAC PDUs for the TTI have been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in 3GPP RP-122033 and 3GPP TS 36.300 V11.4.0, respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. If *extendedBSR-Sizes* is not configured, the values taken by the Buffer Size field are shown in Table 6.1.3.1-1. If *extendedBSR-Sizes* is configured, the values taken by the Buffer Size field are shown in Table 6.1.3.1-2.

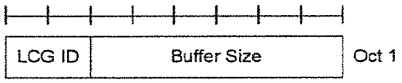


Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element

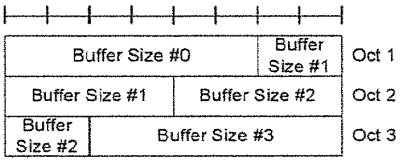


Figure 6.1.3.1-2: Long BSR MAC control element

[0053] 3GPP TR36.392 v12.0.0 discloses the following:

Small cells using low power nodes are considered promising to cope with mobile traffic explosion, especially for hotspot deployments in indoor and outdoor scenarios. A low-power node generally means a node whose Tx power is lower than macro node and BS classes, for example Pico and Femto eNB are both applicable. Small cell enhancements for E-UTRA and E-UTRAN will focus on additional functionalities for enhanced performance in hotspot areas for indoor and outdoor using low power nodes.

This document captures the scenarios and requirements for small cell enhancements. 3 GPP TR 36.913 should be used as reference whenever applicable in order to avoid duplication of the requirements.

[0054] 3 GPP RP-122033 discloses the following:

4 Objective

[0055] The objective of this study is to identify potential technologies in the protocol and architecture for enhanced support of small cell deployment and operation which should satisfy scenarios and requirements defined in TR 36.932.
[0056] The study shall be conducted on the following aspects:

- Identify and evaluate the benefits of UEs having dual connectivity to macro and small cell layers served by different or same carrier and for which scenarios such dual connectivity is feasible and beneficial.

- Identify and evaluate potential architecture and protocol enhancements for the scenarios in TR 36.932 and in particular for the feasible scenario of dual connectivity and minimize core network impacts if feasible, including:

  - Overall structure of control and user plane and their relation to each other, e.g., supporting C-plane and U-plane in different nodes, termination of different protocol layers, etc.

- Identify and evaluate the necessity of overall Radio Resource Management structure and mobility enhancements for small cell deployments:

  - Mobility mechanisms for minimizing inter-node UE context transfer and signalling towards the core network.

ASUS EX2019-p.54
Samsung v. ASUS
IPR2024-00614

- Measurement and cell identification enhancements while minimizing increased UE battery consumption.

[0057] For each potential enhancement, the gain, complexity and specification impact should be assessed.
[0058] The study shall focus on potential enhancements which are not covered by other SI/WIs.
[0059] In 3GPP TS36 300 discusses Carrier Aggregation (CA) as follows:

5.5 Carrier Aggregation

[0060] In Carrier Aggregation (CA), two or more Component Carriers (CCs) are aggregated in order to support wider transmission bandwidths up to 100MHz. A UE may simultaneously receive or transmit on one or multiple CCs depending on its capabilities:

- A UE with single timing advance capability for CA can simultaneously receive and/or transmit on multiple CCs corresponding to multiple serving cells sharing the same timing advance (multiple serving cells grouped in one TAG);
- A UE with multiple timing advance capability for CA can simultaneously receive and/or transmit on multiple CCs corresponding to multiple serving cells with different timing advances (multiple serving cells grouped in multiple TAGs). E-UTRAN ensures that each TAG contains at least one serving cell;
- A non-CA capable UE can receive on a single CC and transmit on a single CC corresponding to one serving cell only (one serving cell in one TAG).

[0061] CA is supported for both contiguous and non-contiguous CCs with each CC limited to a maximum of 110 Resource Blocks in the frequency domain using the Rel-8/9 numerology.
[0062] It is possible to configure a UE to aggregate a different number of CCs originating from the same eNB and of possibly different bandwidths in the UL and the DL:

- The number of DL CCs that can be configured depends on the DL aggregation capability of the UE;
- The number of UL CCs that can be configured depends on the UL aggregation capability of the UE;
- It is not possible to configure a UE with more UL CCs than DL CCs;
- In typical TDD deployments, the number of CCs and the bandwidth of each CC in UL and DL is the same.
- The number of TAGs that can be configured depends on the TAG capability of the UE.

[0063] CCs originating from the same eNB need not to provide the same coverage.
[0064] CCs shall be LTE Rel-8/9 compatible. Nevertheless, existing mechanisms (e.g. barring) may be used to avoid Rel-8/9 UEs to camp on a CC.
[0065] The spacing between centre frequencies of contiguously aggregated CCs shall be a multiple of 300 kHz. This is in order to be compatible with the 100 kHz frequency raster of Rel-8/9 and at the same time preserve orthogonality of the subcarriers with 15 kHz spacing. Depending on the aggregation scenario, the *n* x 300 kHz spacing can be facilitated by insertion of a low number of unused subcarriers between contiguous CCs. [...]

7.5 Carrier Aggregation

[0066] When CA is configured, the UE only has one RRC connection with the network. At RRC connection establishment/re-establishment/handover, one serving cell provides the NAS mobility information (e.g. TAI), and at RRC connection re-establishment/handover, one serving cell provides the security input. This cell is referred to as the Primary Cell (PCell). In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).
[0067] Depending on UE capabilities, Secondary Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).
[0068] The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:

- For each SCell the usage of uplink resources by the UE in addition to the downlink ones is configurable (the number

ASUS EX2019-p.55
Samsung v. ASUS
IPR2024-00614

ofDL SCCs configured is therefore always larger than or equal to the number of UL SCCs and no SCell can be configured for usage of uplink resources only);

- From a UE viewpoint, each uplink resource only belongs to one serving cell;
- The number of serving cells that can be configured depends on the aggregation capability of the UE (see subclause 5.5);
- PCell can only be changed with handover procedure (i.e. with security key change and RACH procedure);
- PCell is used for transmission of PUCCH;
- Unlike SCells, PCell cannot be de-activated (see subclause 11.2);
- Re-establishment is triggered when PCell experiences RLF, not when SCells experience RLF;
- NAS information is taken from PCell.

[0069] The reconfiguration, addition and removal of SCells can be performed by RRC. At intra-LTE handover, RRC can also add, remove, or reconfigure SCells for usage with the target PCell. When adding a new SCell, dedicated RRC signalling is used for sending all required system information of the SCell i.e. while in connected mode, UEs need not acquire broadcasted system information directly from the SCells.

[0070] 3GPP TS36.331 discloses the following about CA:

5.3.5.4 Reception of an *RRCConnectionReconfiguration* including the *mobilityCantrolInfo* by the UE (handover)

[0071] If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

1> stop timer T310, if running;

1> start timer T304 with the timer value set to *t304,* as included in the *mobilityControlInfo;*

1> if the *carrierFreq* is included:

2> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;

1> else:

2> consider the target PCell to be one on the frequency of the source PCell with a physical cell identity indicated by the *targetPhysCellId*;

1> start synchronising to the DL of the target PCell;

[0072] NOTE 1: The UE should perform the handover as soon as possible following the reception of the RRC message triggering the handover, which could be before confirming successful reception (HARQ and ARQ) of this message.

1> reset MAC;

1> re-establish PDCP for all RBs that are established;

[0073] NOTE 2: The handling of the radio bearers after the successful completion of the PDCP re-establishment, e.g. the re-transmission of unacknowledged PDCP SDUs (as well as the associated status reporting), the handling of the SN and the HFN, is specified in TS 36.323.

1> re-establish RLC for all RBs that are established;

1> configure lower layers to consider the SCell(s), if configured, to be in deactivated state;

1> apply the value of the *newUE-Identity* as the C-RNTI;

1> if the *RRCConnectionReconfiguration* message includes the *fullConfig*:

2> perform the radio configuration procedure as specified in section 5.3.5.8;

1> configure lower layers in accordance with the received *radioResourceConfigCommon*;

ASUS EX2019-p.56
Samsung v. ASUS
IPR2024-00614

1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received *mobilityControlInfo;*
1> if the *RRCConnectionReconfiguration* message includes the *radioResourceConfigDedicated*:

2> perform the radio resource configuration procedure as specified in 5.3.10;
1> if the *keyChangeIndicator* received in the *securityConfigHO* is set to *TRUE:*
2> update the K_{eNB} key based on the fresh K_{ASME} key taken into use with the previous successful NAS SMC procedure, as specified in TS 33.401;
1> else:
2> update the K_{eNB} key based on the current K_{eNB} or the NH, using the *nextHopChainingCount* value indicated in the *securityConfigHO,* as specified in TS 33.401;
1> store the *nextHopChainingCount* value;
1> if the *securityAlgorithmConfig* is included in the *securityConfigHO:*
2> derive the K_{RRCint} key associated with the *integrityProtAlgorithm,* as specified in TS 33.401;
2> if connected as an RN:
3> derive the K_{UPint} key associated with the *integrityProtAlgorithm,* as specified in TS 33.401;
2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401;
1> else:
2> derive the K_{RRCint} key associated with the current integrity algorithm, as specified in TS 33.401;
2> if connected as an RN:
3> derive the K_{UPint} key associated with the current integrity algorithm, as specified in TS 33.401;
2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the current ciphering algorithm, as specified in TS 33.401;
1> configure lower layers to apply the integrity protection algorithm and the K_{RRCint} key, i.e. the integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
1> configure lower layers to apply the ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
1> if connected as an RN:
2> configure lower layers to apply the integrity protection algorithm and the K_{UPint} key, for current or subsequently established DRBs that are configured to apply integrity protection, if any;
1> if the received *RRCConnectionReconfiguration* includes the *sCellToReleaseList*:
2> perform SCell release as specified in 5.3.10.3a;
1> if the received *RRCConnectionReconfiguration* includes the *sCellToAddModList*:
2> perform SCell addition or modification as specified in 5.3.10.3b;
1> if the received *RRCConnectionReconfiguration* includes the *systemInformationBlockType1Dedicated*:
2> perform the actions upon reception of the *SystemInformationBlockType1* message as specified in 5.2.2.7;
1> perform the measurement related actions as specified in 5.5.6.1;
1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:
2> perform the measurement configuration procedure as specified in 5.5.2;
1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
1> release *reportProximityConfig* and clear any associated proximity status reporting timer;
1> if the *RRCConnectionReconfiguration* message includes the *otherConfig*:
2> perform the other configuration procedure as specified in 5.3.10.9;
1> set the content *of RRCConnectionReconfigurationComplete* message as follows:
2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report:*
3> include *rlf-InfoAvailable;*
2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
3> include the *logMeasAvailable;*
2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include *connEstFailInfoAvailable*;
1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission;
1> if MAC successfully completes the random access procedure:
2> stop timer T304;

ASUS EX2019-p.57
Samsung v. ASUS
IPR2024-00614

2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;

[0074] NOTE 3: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements. 2> if the UE is configured to provide IDC indications: 3> if the UE has transmitted an *InDeviceCoexIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo:*

4> initiate transmission of the *InDeviceCoexIndication* message in accordance with 5.6.9.3;

2> if the UE is configured to provide power preference indications:

3> if the UE has transmitted a *UEAssistanceInformation* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo:*

4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.6.10.3;

2> the procedure ends;

[0075] NOTE 4: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

5.3.10.3b SCell addition/ modification

[0076] The UE shall:

1> for each *sCellIndex* value included in the *sCellToAddModList* that is not part of the current UE configuration (SCell addition):
2> add the SCell, corresponding to the *cellIdentification*, in accordance with the received *radioResourceConfigCommenSCell* and *radioResourceConfigDedicatedSCell*;
2> configure lower layers to consider the SCell to be in deactivated state;

1> for each *sCellIndex* value included in the *sCellToAddModList* that is part of the current UE configuration (SCell modification):
2> modify the SCell configuration in accordance with the received *radioResourceConfigDedicatedSCell*;

```
SCellToAddModList-r10 ::=       SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-r10

SCellToAddMod-r10 ::=           SEQUENCE {
    sCellIndex-r10                      SCellIndex-r10,
    cellIdentification-r10              SEQUENCE {
        physCellId-r10                      PhysCellId,
        dl-CarrierFreq-r10                  ARFCN-ValueEUTRA
    }                                                           OPTIONAL,   -- Cond SCellAdd

    radioResourceConfigCommonSCell-r10      RadioResourceConfigCommonSCell-r10  OPTIONAL,   --
Cond SCellAdd
    radioResourceConfigDedicatedSCell-r10   RadioResourceConfigDedicatedSCell-r10   OPTIONAL,   -
- Cond SCellAdd2
    ...,
    [[  dl-CarrierFreq-v1090                ARFCN-ValueEUTRA-v9e0   OPTIONAL    -- Cond EARFCN-
max
    ]]
}
```


ASUS EX2019-p.58
Samsung v. ASUS
IPR2024-00614

```
RadioResourceConfigCommonSCell-r10 ::=  SEQUENCE {
    -- DL configuration as well as configuration applicable for DL and UL
    nonUL-Configuration-r10                 SEQUENCE {
        -- 1: Cell characteristics
        dl-Bandwidth-r10                        ENUMERATED {n6, n15, n25, n50, n75, n100},
        -- 2: Physical configuration, general
        antennaInfoCommon-r10                   AntennaInfoCommon,
        mbsfn-SubframeConfigList-r10            MBSFN-SubframeConfigList    OPTIONAL,   -- Need
OR
        -- 3: Physical configuration, control
        phich-Config-r10                        PHICH-Config,
        -- 4: Physical configuration, physical channels
        pdsch-ConfigCommon-r10                  PDSCH-ConfigCommon,
        tdd-Config-r10                          TDD-Config                  OPTIONAL    -- Cond
TDDSCell
    },
    -- UL configuration
    ul-Configuration-r10                    SEQUENCE {
        ul-FreqInfo-r10                     SEQUENCE {
            ul-CarrierFreq-r10                  ARFCN-ValueEUTRA            OPTIONAL,   -- Need
OP
            ul-Bandwidth-r10                    ENUMERATED {n6, n15,
                                                    n25, n50, n75, n100}    OPTIONAL,   -- Need
OP
            additionalSpectrumEmissionSCell-r10     AdditionalSpectrumEmission
        },
        p-Max-r10                           P-Max                       OPTIONAL,   -- Need OP
        uplinkPowerControlCommonSCell-r10       UplinkPowerControlCommonSCell-r10,
        -- A special version of IE UplinkPowerControlCommon may be introduced
        -- 3: Physical configuration, control
        soundingRS-UL-ConfigCommon-r10      SoundingRS-UL-ConfigCommon,
        ul-CyclicPrefixLength-r10           UL-CyclicPrefixLength,
        -- 4: Physical configuration, physical channels
        prach-ConfigSCell-r10                   PRACH-ConfigSCell-r10       OPTIONAL,   -- Cond
TDD-OR-NoR11
        pusch-ConfigCommon-r10              PUSCH-ConfigCommon
    }                                                                       OPTIONAL,   -- Need OR
    ...,
    [[  ul-CarrierFreq-v1090                ARFCN-ValueEUTRA-v9e0           OPTIONAL    -- Need
OP
    ]],
    [[  rach-ConfigCommonSCell-r11          RACH-ConfigCommonSCell-r11      OPTIONAL,   -- Cond
UL
        prach-ConfigSCell-r11               PRACH-Config                    OPTIONAL,   -- Cond
UL
        tdd-Config-v1130                    TDD-Config-v1130            OPTIONAL,   -- Cond TDD2
        uplinkPowerControlCommonSCell-v1130
                                UplinkPowerControlCommonSCell-v1130 OPTIONAL    -- Cond UL
    ]]
}
```

```
RadioResourceConfigDedicatedSCell-r10 ::=   SEQUENCE {
    -- UE specific configuration extensions applicable for an SCell
    physicalConfigDedicatedSCell-r10        PhysicalConfigDedicatedSCell-r10    OPTIONAL,   --
Need ON
    ...,
    [[  mac-MainConfigSCell-r11         MAC-MainConfigSCell-r11         OPTIONAL    -- Cond
SCellAdd


    ]]
}
```

- *MobilityControlInfo*

[0077] The IE *MobilityControlInfo* includes parameters relevant for network controlled mobility to/within E-UTRA.

***MobilityControlInfo* information** element

[0078]

ASUS EX2019-p.59
Samsung v. ASUS
IPR2024-00614

```
-- ASN1START

MobilityControlInfo ::=     SEQUENCE {
    targetPhysCellId                    PhysCellId,
    carrierFreq                         CarrierFreqEUTRA                    OPTIONAL,   -- Cond
HO-toEUTRA2
    carrierBandwidth                    CarrierBandwidthEUTRA               OPTIONAL,   -- Cond
HO-toEUTRA
    additionalSpectrumEmission          AdditionalSpectrumEmission          OPTIONAL,   -- Cond
HO-toEUTRA
    t304                                ENUMERATED {
                                            ms50, ms100, ms150, ms200, ms500, ms1000,
                                            ms2000, spare1},
    newUE-Identity                      C-RNTI,
    radioResourceConfigCommon           RadioResourceConfigCommon,
    rach-ConfigDedicated                RACH-ConfigDedicated                OPTIONAL,   -- Need
OP
    ...,
    [[  carrierFreq-v9e0                CarrierFreqEUTRA-v9e0               OPTIONAL    -- Need
ON
    ]],
    [[  drb-ContinueROHC-r11            ENUMERATED {true}                   OPTIONAL    -- Cond
HO
    ]]
}

CarrierBandwidthEUTRA ::=           SEQUENCE {
    dl-Bandwidth                        ENUMERATED {
                                            n6, n15, n25, n50, n75, n100, spare10,
                                            spare9, spare8, spare7, spare6, spare5,
                                            spare4, spare3, spare2, spare1},
    ul-Bandwidth                        ENUMERATED {
                                            n6, n15, n25, n50, n75, n100, spare10,
                                            spare9, spare8, spare7, spare6, spare5,
                                            spare4, spare3, spare2, spare1} OPTIONAL -- Need
OP
}

CarrierFreqEUTRA ::=                SEQUENCE {
    dl-CarrierFreq                      ARFCN-ValueEUTRA,
    ul-CarrierFreq                      ARFCN-ValueEUTRA                OPTIONAL    -- Cond FDD
}

CarrierFreqEUTRA-v9e0 ::=           SEQUENCE {
    dl-CarrierFreq-v9e0                 ARFCN-ValueEUTRA-r9,
    ul-CarrierFreq-v9e0                 ARFCN-ValueEUTRA-r9         OPTIONAL    -- Cond FDD
}

-- ASN1STOP
```

[0079] 3GPP R2-130420 discusses protocol architecture alternatives for dual connectivity. Alternative U3 is a centralized PDCP termination and Alternative U4 is a distributed protocol termination for user plane. The pros and cons of these two alternatives are quoted below:

3.3 Alternative U3: Centralized PDCP termination

- Pros:

  > No extra load on EPC in terms of number of connections and path switches

- Cons:

  > Requirements on backhaul between macro and low power node
  > High capacity
  > Medium/Loose latency (PDCP reordering)
  > User data need to pass through central point

3.4 Alternative U4: Distributed protocol termination

ASUS EX2019-p.60
Samsung v. ASUS
IPR2024-00614

- Pros:

  > Supports local breakout at the low power eNB. User plane can be optimized towards EPC
  > Good support for non-ideal backhaul
  > No user data transmission required between macro and low power eNBs
  > Establishing/removing low power node connectivity and PDCP / RLC relocation can be based on Rel-8 handover procedure with PDCP forwarding.

- Cons:

  > Extra load on EPC in terms of number of connections and path switches
  > Possible security implications need further study

[0080] 3GPP R2-130570 discusses scenarios and benefits of dual connectivity. It also addresses several protocol architecture alternatives for dual connectivity.

[0081] When UE is configured with both a Macro Cell and Small Cell, a PUCCH resource may be also needed for Small Cell due to uplink acknowledgement for DL data. However, PUCCH resource is typically configured for Macro Cell/PCell, it may be possible to configure PUCCH resources for scheduling requests on a Small Cell. Due to potential issues of non-ideal backhaul between the Macro Cell and the Small Cell, resource scheduling probably should be done in Small Cell itself.

[0082] Since some specific service and Control-plane data can be handled on Macro Cell and User-plane data can be handled on Small Cell, it may be possible that some service/data can be served simultaneously by both Macro and Small Cells.

[0083] If a UE is configured with more than one SR resource on PUCCH (which might be on the same Cell or different Cells), specific methods and/or coordination for the SR resources may be used to improve the efficiency of requesting UL resources of Macro or Small Cells.

[0084] In the following embodiments, a resource scheduler may be defined as resource allocator, Macro Cell/eNB, Small Cell/eNB, eNB, PCell or SCell, Macro Cell/eNB and Small Cell/eNB may be located in different geographical locations.

[0085] Since more than one SR resource is configured (on PUCCH) when a SR is triggered by BSR procedure, a user equipment (UE) would choose the nearest/upcoming configured (i.e., valid) SR resource to start a SR procedure. The UE would limit itself to the chosen SR resource and the UE may skip the other available SR resources. As shown in FIG. 5, SR1 and SR2 are two configured SR resources and SR1 is the nearest resource after BSR is triggered. The SR1 resource is chosen and the UE would send scheduling requests continuously with SR1 and skip SR2 resources.

[0086] In another method as shown in FIG. 6, the UE would use or attempt to use all valid SR resources. In one method, the UE could maintain independent SR procedures, for example, one SR procedure per Macro Cell (group) or Small Cell (group). In another method, a single SR procedure may be used for all valid Macro Cell or Small Cells.

[0087] According to one embodiment in which independent SR procedures are adopted per cell or cell group, all SR procedures would be considered complete upon a completion of any SR procedures. If one SR procedure fails (e.g., fails to achieve the SR maximum transmission times) while other SR procedures are still ongoing/pending, the Random Access (RA) procedure associated with the failed SR procedure would not be triggered because there are still chances on other SR resources. Accordingly, it is not urgent to trigger RACH procedure for requesting UL resources. However, the action of clearing any configured downlink assignments and uplink grants and/or notifying RRC to release PUCCH/SRS could be done (optionally, partially or completely).

[0088] In one embodiment, performing a RACH procedure could be considered after all SR procedures have failed. The RACH procedures may be performed on specific Macro and/or Small Cells. Alternatively, the RACH procedures may be performed on all Cells relevant to all the SR procedures.

[0089] If a common SR procedure is adopted, most actions would be similar to what is disclosed in 3GPP TS 36.321 V11.2.0. However, 3gPP TS 36.321 V11.2.0 does not contemplate how and/when to perform a RACH procedure.

[0090] In yet another method, SR resources may be configured (partially or completely) at the same time. In this method, the UE could choose a specific SR resource on a Macro or Small Cell or, alternatively, randomly select a SR resource as illustrate in FIG. 7. In FIG. 7, SR resource 1 and SR resource 2 may be configured on the different schedulers/Cells. In some instances, the locations of SR resource 1 and SR resource 2 are partially overlapping, which may result in SR1 and SR2 being sent at the same time from SR resource 1 and SR resource 2, respectively. As shown in FIG. 7, the UE may only choose to use SR resource 1 in the first scenario or only use SR resource 2 in the second scenario. In the third scenario shown in FIG. 7, the UE may decide to use both SR resources and prioritize SR resource 1 over SR resource 2 or vice versa (when they are configured at the same time). This rule can be configured by network or determined by UE itself. This method can be combined with the methods described above. When considering the

ASUS EX2019-p.61
Samsung v. ASUS
IPR2024-00614

possibility of simultaneously transmission on more than one PUCCH, the UE may depend on this restriction to determine which way to proceed. Taking the third case of FIG. 7 as an example, if the UE is able to use SR resource 1 and 2 at the same time, the UE may be able to send SR1 and SR2 at the same time. If UE is unable to use both SR resources 1 and 2 at the same time, the UE may choose either resource by according to a network configuration or by a UE decision.

[0091] Considering a scenario having a SR prohibit timer in one SR procedure with one SR resource in which a common SR procedure is adopted, the UE would need to differentiate/decide whether the SR resource is prohibited. In one embodiment, the UE would make this determination based on whether the scheduler (e.g., Macro or Small Cell) used the same SR resource (i.e., the previous and following SR resources are used for the same scheduler). If the SRs are sent to the same scheduler, then the following SR resource would be prohibited by a running prohibit timer.

[0092] As those skilled in the art will appreciate, the examples and descriptions disclose herein may be applied to more than two configured resources.

[0093] Referring back to FIGS. 3 and 4, the device 300 includes a program code 312 stored in memory 310. In one embodiment, the CPU 308 could execute program code 312 to execute one or more of the following: (i) to configure a user equipment (UE) with a first serving cell and a second serving cell; (ii) to configure the UE with at least a first and a second scheduling request (SR) resource on a physical uplink control channel; (iii) to select the first SR resource to start a SR procedure in response to a trigger by a buffer status report (BSR), wherein the first SR resource is nearer to the BSR than the second SR resource; and (iv) to send scheduling requests with the first SR resource.

[0094] In addition, the CPU 308 can execute the program code 312 to perform all of the above-described actions and steps or others described herein. For example, in one other embodiment, the CPU 308 could execute program code 312 to execute one or more of the following: (i) to configure a user equipment (UE) with a first serving cell and a second serving cell; (ii) to configure the UE with a first scheduling request (SR) resource on a first physical uplink control channel and a second SR resource on a second physical uplink control channel; (iii) to select a first SR resource or the second SR resource to start a SR procedure in response to a trigger by a buffer status report (BSR), wherein the UE uses all SR resources to send scheduling requests; and (iv) to send scheduling requests with the first SR resource and the second SR resource on the first and the second physical uplink control channels, respectively.

[0095] Various aspects of the disclosure have been described above. It should be apparent that the teachings herein may be embodied in a wide variety of forms and that any specific structure, function, or both being disclosed herein is merely representative. Based on the teachings herein one skilled in the art should appreciate that an aspect disclosed herein may be implemented independently of any other aspects and that two or more of these aspects may be combined in various ways. For example, an apparatus may be implemented or a method may be practiced using any number of the aspects set forth herein. In addition, such an apparatus may be implemented or such a method may be practiced using other structure, functionality, or structure and functionality in addition to or other than one or more of the aspects set forth herein. As an example of some of the above concepts, in some aspects concurrent channels may be established based on pulse repetition frequencies. In some aspects concurrent channels may be established based on pulse position or offsets. In some aspects concurrent channels may be established based on time hopping sequences. In some aspects concurrent channels may be established based on pulse repetition frequencies, pulse positions or offsets, and time hopping sequences.

[0096] Those of skill in the art would understand that information and signals may be represented using any of a variety of different technologies and techniques. For example, data, instructions, commands, information, signals, bits, symbols, and chips that may be referenced throughout the above description may be represented by voltages, currents, electromagnetic waves, magnetic fields or particles, optical fields or particles, or any combination thereof.

[0097] Those of skill would further appreciate that the various illustrative logical blocks, modules, processors, means, circuits, and algorithm steps described in connection with the aspects disclosed herein may be implemented as electronic hardware (e.g., a digital implementation, an analog implementation, or a combination of the two, which may be designed using source coding or some other technique), various forms of program or design code incorporating instructions (which may be referred to herein, for convenience, as "software" or a "software module"), or combinations of both. To clearly illustrate this interchangeability of hardware and software, various illustrative components, blocks, modules, circuits, and steps have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled artisans may implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the present disclosure.

[0098] In addition, the various illustrative logical blocks, modules, and circuits described in connection with the aspects disclosed herein may be implemented within or performed by an integrated circuit ("IC"), an access terminal, or an access point. The IC may comprise a general purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, electrical components, optical components, mechanical components, or any combination thereof designed to perform the functions described herein, and may execute codes or instructions that reside within the IC, outside of the IC, or both. A general purpose processor may be a microprocessor, but in the

ASUS EX2019-p.62
Samsung v. ASUS
IPR2024-00614

alternative, the processor may be any conventional processor, controller, microcontroller, or state machine. A processor may also be implemented as a combination of computing devices, e.g., a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration.

[0099] It is understood that any specific order or hierarchy of steps in any disclosed process is an example of a sample approach. Based upon design preferences, it is understood that the specific order or hierarchy of steps in the processes may be rearranged while remaining within the scope of the present disclosure. The accompanying method claims present elements of the various steps in a sample order, and are not meant to be limited to the specific order or hierarchy presented.

[0100] The steps of a method or algorithm described in connection with the aspects disclosed herein may be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module (e.g., including executable instructions and related data) and other data may reside in a data memory such as RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, a hard disk, a removable disk, a CD-ROM, or any other form of computer-readable storage medium known in the art. A sample storage medium may be coupled to a machine such as, for example, a computer/processor (which may be referred to herein, for convenience, as a "processor") such the processor can read information (e.g., code) from and write information to the storage medium. A sample storage medium may be integral to the processor. The processor and the storage medium may reside in an ASIC. The ASIC may reside in user equipment. In the alternative, the processor and the storage medium may reside as discrete components in user equipment. Moreover, in some aspects any suitable computer-program product may comprise a computer-readable medium comprising codes relating to one or more of the aspects of the disclosure. In some aspects a computer program product may comprise packaging materials.

[0101] While the invention has been described in connection with various aspects, it will be understood that the invention is capable of further modifications. This application is intended to cover any variations, uses or adaptation of the invention following, in general, the principles of the invention, and including such departures from the present disclosure as come within the known and customary practice within the art to which the invention pertains.

Claims

1. A method for scheduling request operation of a small cell in a wireless communication system, the method comprising:

   having a user equipment, in the following also referred to as UE, configured with a first serving cell and a second serving cell;
   configuring the UE with a first scheduling request, in the following also referred to as SR, resource on a first physical uplink control channel and a second SR resource on a second physical uplink control channel;
   selecting, by the UE, the first SR resource to start a SR procedure in response to a trigger by a buffer status report, in the following also referred to as BSR, wherein an availability to use the first SR resource is nearer to a timing of a triggering of the BSR than the availability of the second SR resource; and
   sending, by the UE, scheduling requests with the first SR resource on the first physical uplink control channel.

2. The method of claim 1, further comprising: ignoring, by the UE, the second SR resource for sending scheduling requests.

3. The method of claim 1 or 2, wherein the first serving cell is a Macro Cell and the second serving cell is a Small Cell, or wherein the first serving cell is a Small Cell and the second serving cell is a Macro Cell.

4. The method of anyone of claims 1 to 3, wherein the first serving cell and the second serving cell are controlled by different schedulers.

5. The method of claim 4, further comprising:

   starting a prohibit timer upon sending the first scheduling request; and
   deciding, by the UE, whether a SR resource following the first SR resource is prohibited based on whether the following SR resource and the first SR resource are associated with the same scheduler.

6. The method of anyone of claims 1 to 5, wherein the first serving cell and the second serving cell are connected to each other through a non-ideal backhaul.

7. A method for scheduling request operation of a small cell in a wireless communication system, the method comprising:

ASUS EX2019-p.63
Samsung v. ASUS
IPR2024-00614

having a user equipment, in the following also referred to as UE, configured with a first serving cell and a second serving cell;
configuring the UE with a first scheduling request, in the following also referred to as SR, resource on a first physical uplink control channel and a second SR resource on a second physical uplink control channel;
selecting, by the UE, a first SR resource or the second SR resource to start a SR procedure in response to a trigger by a buffer status report, in the following also referred to as BSR, wherein the UE uses all SR resources to send scheduling requests; and
sending, by the UE, scheduling requests with the first SR resource and the second SR resource on the first and the second physical uplink control channels, respectively.

8. The method of claim 7, wherein the first and the second SR resources have independent SR procedures.

9. The method of claim 7 or 8, wherein a common SR procedure is used for the first and second SR resources.

10. The method of anyone of claims 7 to 9, wherein the first serving cell is a Macro Cell and the second serving cell is a Small Cell, or wherein the first serving cell is a Small Cell and the second serving cell is a Macro Cell.

11. The method of anyone of claims 7 to 10, wherein the first serving cell and the second serving cell are controlled by different schedulers.

12. The method of claim 11, further comprising:

starting a prohibit timer upon sending the first scheduling request; and
deciding, by the UE, whether a SR resource is prohibited based on whether the following SR resource and the previously used SR resource are associated with the same scheduler.

13. The method of anyone of claims 7 to 12, wherein the first serving cell and the second serving cell are connected to each other through a non-ideal backhaul.

14. A communication device (300) for scheduling request operation of a small cell in a wireless communication system, the communication device (300) comprising:

a control circuit (306);
a processor (308) installed in the control circuit (306);
a memory (310) installed in the control circuit (306) and operatively coupled to the processor (308);
wherein the processor (308) is configured to execute a program code (312) stored in memory (310) to provide a scheduling request operation of a small cell in a wireless communication system by the method steps as defined in anyone of the preceding claims.

ASUS EX2019-p.64
Samsung v. ASUS
IPR2024-00614

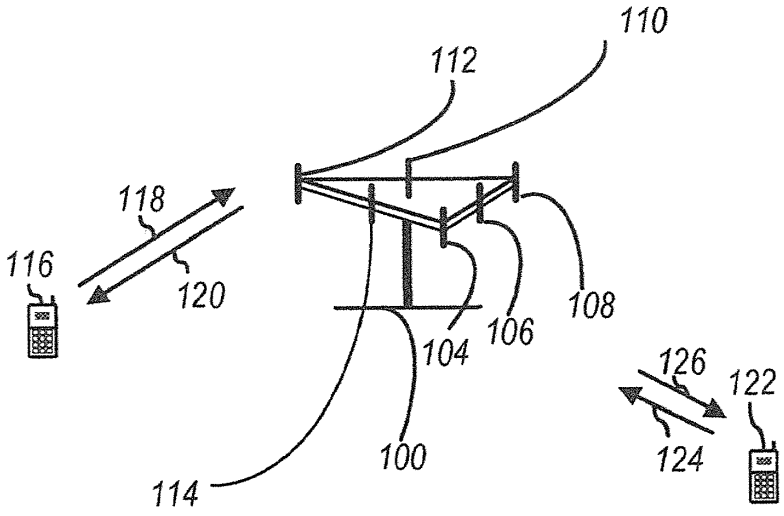


FIG. 1

ASUS EX2019-p.65
Samsung v. ASUS
IPR2024-00614

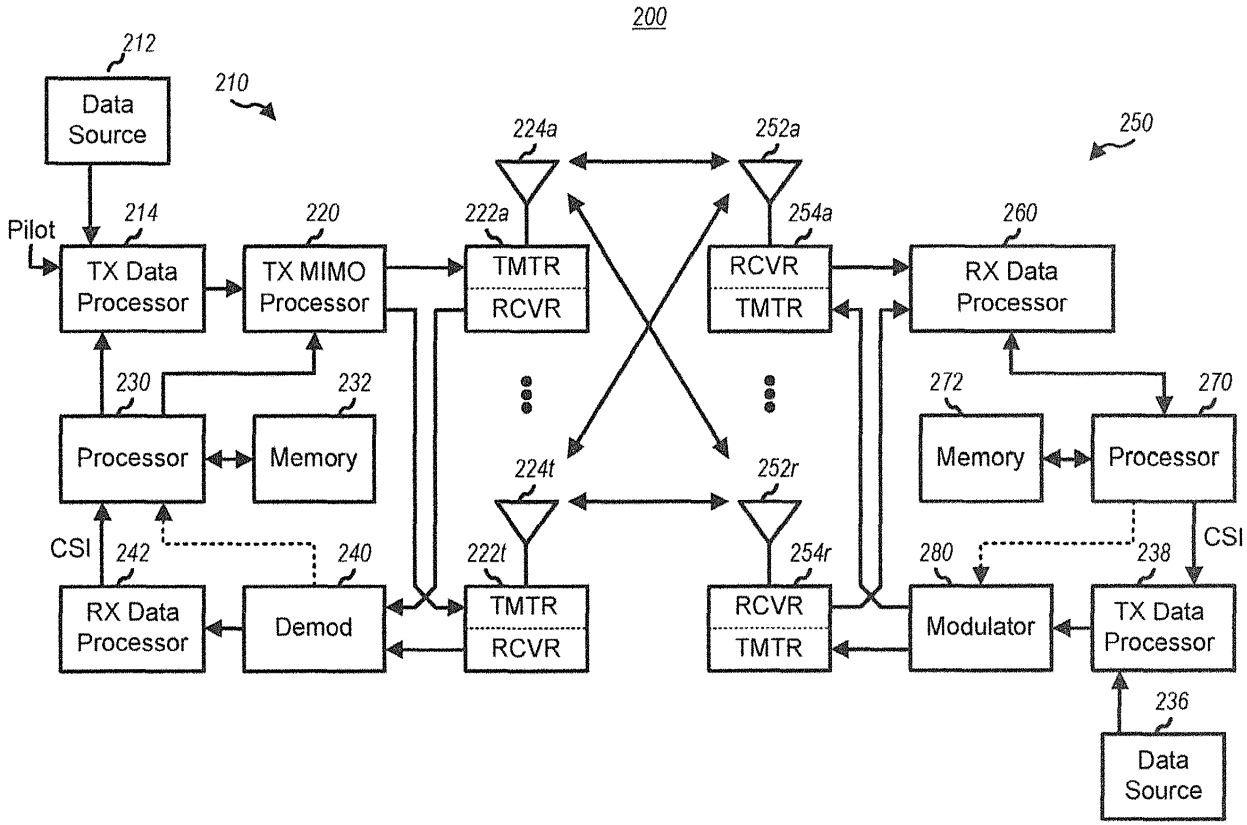


FIG. 2

ASUS EX2019-p.66
Samsung v. ASUS
IPR2024-00614

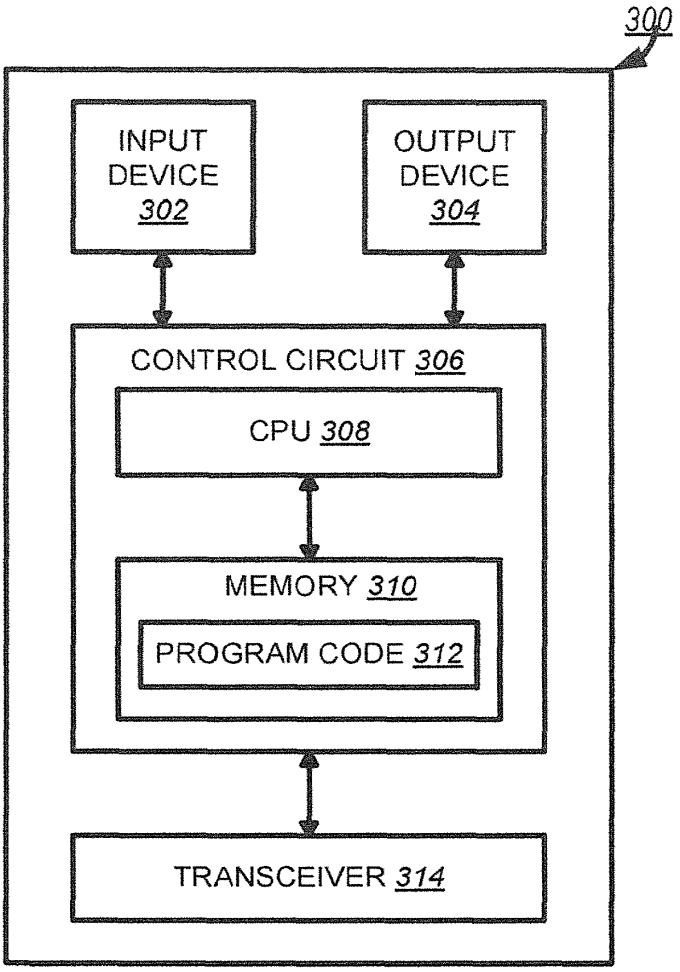


FIG. 3

ASUS EX2019-p.67
Samsung v. ASUS
IPR2024-00614

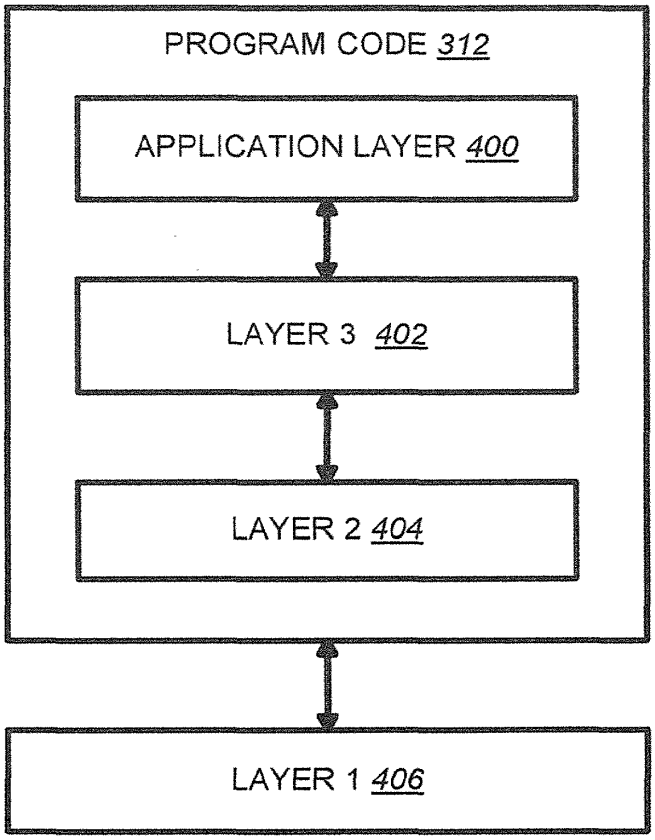


FIG. 4

ASUS EX2019-p.68
Samsung v. ASUS
IPR2024-00614

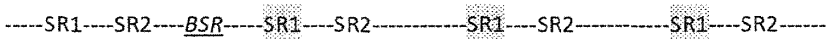


FIG. 5

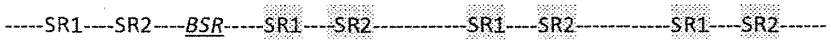


FIG. 6

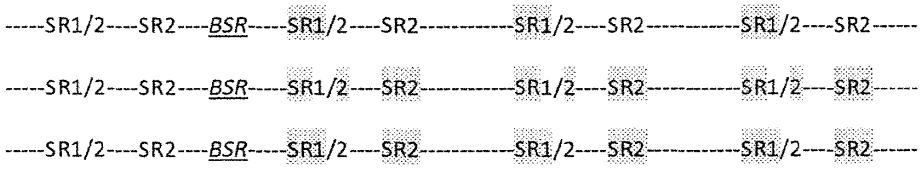


FIG. 7

ASUS EX2019-p.69
Samsung v. ASUS
IPR2024-00614

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 14 16 2778

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2011/082110 A1 (QUALCOMM INC [US]; HO SAI YIU DUNCAN [US]; CHEN WANSHI [US]; MONTOJO J) 7 July 2011 (2011-07-07) * paragraph [0040] - paragraph [0079] *	1,7,14	INV. H04W84/04 H04W72/12 H04W48/16
X	WO 2013/023681 A1 (NOKIA SIEMENS NETWORKS OY [FI]; HOOLI KARI JUHANI [FI]; LUNTTILA TIMO) 21 February 2013 (2013-02-21) * page 5, line 4 - page 26, line 18 *	1-13	
A	ERICSSON, ST ERICSSON: "Protocol architecture for dual connectivity", 3GPP TSG-RAN WG2 81; TDOC R2-130420, 28 January 2013 (2013-01-28), - 1 February 2013 (2013-02-01), pages 1-10, XP002730432, malta * the whole document *	1-14	

TECHNICAL FIELDS SEARCHED (IPC)
H04W

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Berlin	30 September 2014	García, Montse

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ASUS EX2019-p.70
Samsung v. ASUS
IPR2024-00614

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 16 2778

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

30-09-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011082110 A1	07-07-2011	CN 102696247 A	26-09-2012
		EP 2520106 A1	07-11-2012
		JP 2013516147 A	09-05-2013
		KR 20120109590 A	08-10-2012
		TW 201136376 A	16-10-2011
		US 2011321050 A1	29-12-2011
		WO 2011082110 A1	07-07-2011
WO 2013023681 A1	21-02-2013	CN 103875294 A	18-06-2014
		EP 2742753 A1	18-06-2014
		US 2014198761 A1	17-07-2014
		WO 2013023681 A1	21-02-2013

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ASUS EX2019-p.71
Samsung v. ASUS
IPR2024-00614

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 61807103 A **[0001]**

Non-patent literature cited in the description

- E-UTRA; MAC protocol specification. *TS36.321 v11.2.0,* March 2013 **[0008]**
- Scenarios and Requirements for Small Cell Enhancements for E-UTRA and E-UTRAN. *TR36.392 v12.0.0,* December 2012 **[0008]**
- Protocol architecture alternatives for dual connectivity. *R2-130420* **[0008]**
- New Study Item Description: Small Cell enhancements for E-UTRA and E-UTRAN - Higher-layer aspects. *TR 36.913, RP-122033* **[0008]**
- Report of 3GPP TSG RAN WG2 meeting #72. *3GPP R2-130570* **[0008]**

ASUS EX2019-p.72
Samsung v. ASUS
IPR2024-00614

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
NOKIA TECHNOLOGIES OY
Ari Aarnio IPR Department
Karakaari 7
FI- 02610 Espoo
FINLAND

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 17 August 2017 (17.08.2017)
Applicant´s or agent´s file reference NC101437WO	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/FI2017/050343	International filing date *(day/month/year)* 04 May 2017 (04.05.2017)
Applicant NOKIA TECHNOLOGIES OY	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide,* International Phase, paragraphs 9.004 - 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45**bis**.1). The procedure for requesting supplementary international search is described in the **PCT Applicant's Guide**, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/FI Finnish Patent and Registration Office P.O. Box 1160, FI-00101 HELSINKI, Finland Facsimile No. +358 29 509 5328	Authorized officer Harald Kaaja Telephone No. +358 29 509 5000

Form PCT/ISA/220 (July 2017)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
NOKIA TECHNOLOGIES OY
Ari Aarnio IPR Department
Karakaari 7
FI-02610 Espoo
FINLAND

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)*: 17 August 2017 (17.08.2017)
Applicant´s or agent´s file reference: NC101437WO	**FOR FURTHER ACTION**: See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/FI2017/050343	04 May 2017 (04.05.2017)	12 May 2016 (12.05.2016)

International Patent Classification (IPC) or both national classification and IPC: See supplemental box

Applicant: NOKIA TECHNOLOGIES OY

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [x] Box No. VII Certain defects in the international application
- [x] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/FI	Date of completion of this opinion	Authorized officer
Finnish Patent and Registration Office P.O. Box 1160, FI-00101 HELSINKI, Finland	15 August 2017 (15.08.2017)	Harald Kaaja
Facsimile No. +358 29 509 5328		Telephone No. +358 29 509 5000

Form PCT/ISA/237 (cover sheet) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/FI2017/050343

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

ASUS EX2019-p.75
Samsung v. ASUS
IPR2024-00614

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/FI2017/050343

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	---	YES
	Claims	1-28	NO
Inventive step (IS)	Claims	---	YES
	Claims	1-28	NO
Industrial applicability (IA)	Claims	1-28	YES
	Claims	---	NO

2. Citations and explanations:

2.1 Documents cited

Reference is made to the following documents:

D1: US 2011310833 A1 (LEE OK-SEON [KR] et al.) 22 December 2011 (22.12.2011),
D2: 3GPP, Report of 3GPP TSG RAN WG2 meeting #91. R2-154032, In: [online], 2015-10-09, [retrieved on 2017-08-15].
D3: US 2012230232 A1 (JI HYOUNGJU [KR] et al.) 13 September 2012 (13.09.2012),
D4: 3GPP, Nokia, Alcatel-Lucent Shanghai Bell: Skipping empty BSR and feedback for SPS activation/ deactivation. R2-162504, In: [online], 2016-04-02, [retrieved on 2017-08-15].
D5: 3GPP, Samsung: Skipping uplink transmission with no data to transmit. R2-153332, In: [online], 2015-08-14, [retrieved on 2017-08-15].

2.2 Claimed invention

The application concerns an invention defined in claims 1-28.

The invention generally relates to wireless or mobile communications networks, and also to methods and apparatuses for possibly skipping transport block (TB) transmission depending on uplink control information (UCI) transmission.

The invention is claimed as a method (**claims 1, 18**), as an apparatus **(claims 8, 16, 22, 26),** and a computer program (**claim 28**). The preferred embodiments of the invention are defined in dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27.

The aim of this invention is to reduce latency and save power, improving the functioning of communications networks and their nodes.

Independent claim 1 defines a method, comprising:
- (**F1**): receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission when there is no uplink data; and
- (**F2**): determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant.

Independent claim 8 defines an apparatus comprising at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least comprising the method (with features **F1-F2**) according to **independent claim 1**.

Independent claim 16 defines an apparatus comprising means for performing a method (with features **F1-F2**) according to **independent claim 1**.

Continued to next page

ASUS EX2019-p.76
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (1 / 4)

Independent claim 18 defines a method, comprising:
- (**F3**): transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and
- **(F4)**: receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

Independent claim 22 defines an apparatus comprising at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least comprising the method (with features **F3-F4**) according to **independent claim 18**.

Independent claim 26 defines an apparatus comprising means for performing a method (with features **F3-F4**) according to **independent claim 18**.

Independent claim 28 defines a computer program, embodied on a non-transitory computer readable medium, wherein the computer program is configured to control a processor to perform a method according to any one of **claims 1-7 or 18-21.**

All patent claims were subjected to a novelty search.

2.3 Novelty under PCT Article 33(2)

2.3.1 Independent claims

Documents D1 represents the most relevant prior art and documents D2-D5 represents the general state of the art.

Document D1 is regarded as the closest prior art (the references given below in parentheses relate to this document).

D1 relates to (Abstract) a system and a method minimizing power consumption, signalling overhead, and processing load in blind scheduling in a mobile communication system. A User Equipment (UE) detects a type of an uplink (UL) grant while it is periodically allocated the UL grant. If there is no data to transmit using the UL grant, the UE determines whether to transmit a padding Medium Access Control (MAC) Protocol Data Unit (PDU) to an Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Node B (eNB) using the UL grant according to the type of the UL grant.

Document D2 is related (in particular chapter 7.11) to meeting report including study on latency reduction techniques for LTE, e.g., discussions of skipping uplink transmission with no data to transmit.

Document D3 (The whole document) describes a flexible Time Division Duplex (TDD) method and apparatus for improving efficiency of communication system. A communication method of a base station supporting TDD includes transmitting, to a terminal, first information including at least one of a flag indicating whether flexible subframes are used and an indicator indicating a candidate flexible subframe set to an uplink subframe; transmitting, to the terminal, second information including a switch flag indicating whether to use the candidate flexible subframe as a downlink subframe; and transmitting, to the terminal, when the candidate flexible subframe is indicated to be used as the downlink subframe, the candidate flexible subframe as the downlink subframe.

Document D4 (The whole document) relates skipping empty BSR and feedback for SPS activation/ deactivation.

Document D5 (The whole document) relates skipping uplink transmission with no data to transmit.

D1 discloses the following technical features (F1-F2) of **claim 1**:

(**F1**): receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission

Continued to next page

ASUS EX2019-p.77
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (2 / 4)

when there is no uplink data; and (paragraphs [0013]-[0017], [0020], [0046]-[0054], figures 2, 6, 12), "... allocating an uplink (UL) grant to a user equipment (UE) using Semi-Persistent Scheduling (SPS). And when no data is detected from the UL grant, it is determined that the **UE transmits no data using the UL grant**...", "...The UE includes a control unit that determines whether there is data to transmit using an uplink (UL) grant...", "...If the UE has no data to transmit using the Explicit UL grant, the UE ends its process....." and also "...The Configured UL grant represents **a UL grant that is allocated to a UE** that has **received** a separate SPS **configuration Information Element** (IE)...". This corresponds to the feature **F1 of independent claim 1**.

(**F2**): determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant; (paragraphs [0017]-[0021], [0046]-[0052]), "...The UE includes a control unit detects a type of an uplink (UL) grant while the UE is periodically allocated a UL grant...The transmission unit transmits Hybrid Automatic Retransmission Request (HARQ) feedback information to a user equipment (UE) under specific control. And the control unit determines whether data is detected from the FAS grant, controlling the resource allocation unit to allocate a new FAS grant to the UE when no data is detected from the FAS grant, and controls the transmission unit to transmit HARQ feedback information to the UE..." and "...determined in block 119 that the UE has data to transmit using the Configured UL grant, the UE transmits the data using the Configured UL grant in block 123, and then ends the process...". This corresponds to the feature **F2 of independent claim 1**.

D1 discloses the following technical features (F3-F4) of **claim 18**:

(**F3**): transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and (paragraphs [0054]-[0055], figures 2, 11), "...an eNB 213 sets a value of a New Data Indicator (NDI) for a Hybrid Automatic Retransmission Request (HARQ) process x to '0', and allocates an Explicit UL grant for the HARQ process x to a UE 211 in an n-th frame in step 215. ... In step 217, the UE 211 performs no operation because it has no data to transmit on a UL in (n+4)-th frame. That is, because the type of a UL grant is an Explicit UL grant, the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL...". This corresponds to the feature **F3 of independent claim 18**.

(**F4**): receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.(paragraphs [0046]-[0055], [0080]-[0081], figures 1-2, 11), "...the UE determines if it has data to transmit using the Configured UL grant. If the UE has no data to transmit using the Configured UL grant, the UE transmits padding MAC PDUs using the Configured UL grant in block 121, and then ends the process....the eNB 213 sets a value of the NDI to '1' and allocates an Explicit UL grant for the HARQ process x to the UE 211 in an (n+8)-th frame in step 219. When having data to transmit on a UL, the UE 211 transmits the data using the Explicit UL grant in an (n+12)-th frame in step 221..." and also "...The eNB determines a UL grant mapped to a FAS C-RNTI taking into account the Modulation and Coding Scheme (MCS) level, the Transport Block (TB) size, the number of Radio Bearers (RBs), and such...". This corresponds to the feature **F4 of independent claim 18**.

In summary: **Document D1** discloses all the features set forth in **independent claims 1 and 18.** Thus, the subject matter of claims 1 and 18 is not novel. The same reasoning applies, mutatis mutandis, to the subject matter of the corresponding **independent claims 8, 16, 22, 26 and 28,** which therefore is not considered novel, either.

Continued to next page

ASUS EX2019-p.78
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (3 / 4)

2.3.2 Dependent claims

The additional features set forth in **dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27** are anticipated by **D1 :**

- **Claims 2, 5: D1** discloses (paragraphs [0015], [0046]-[0054], figures 1-2) " ...The blind scheduling method includes **determining whether there is data to transmit using an uplink (UL) grant**, while the UE is periodically allocated the UL grant....", "...if it is determined ... the UE has data to transmit using the Explicit UL grant, the UE transmits the data using the Explicit UL grant in block 117.... If it is determined ... the detected type of the UL grant is not an Explicit UL grant but a Configured UL grant, ... The Configured UL grant represents a UL grant that is allocated to a **UE that has received a separate SPS configuration Information Element (IE)** such as an SPS C-RNTI. Resource allocation information regarding the Configured UL grant is transmitted using a PDCCH, and once allocated, a transmission resource is valid until it is released or changed....when having no data to transmit on a UL, the **UE determines whether to transmit padding MAC PDUs according to the type of a UL grant.** If the type of the UL grant is an Explicit UL grant, **the UE transmits no padding MAC PDUs when it has no data to transmit on a UL**...." and also "...In block 119, the UE determines if it has data to transmit using the Configured UL grant. If the UE has no data to transmit using the Configured UL grant, the UE transmits padding MAC PDUs using the Configured UL grant in block 121, and then ends the process...". The UE receives UL grant from the eNB. The same holds **for dependent claims 9 and 12.** Therefore, the subject matter of **dependent claims 2, 5, 9 and 12** is not novel.

- **Claim 3: document D1** discloses (paragraphs [0040]-[0042], [0054]) " ...if a User Equipment (UE) being periodically allocated a dedicated uplink (UL) resource has no data to transmit on a UL, the UE **determines whether** to transmit **padding** Medium Access Control (MAC) **Protocol Data Units** (PDUs) according to the type of the allocated dedicated UL resource.....", "...the UE 211 performs no operation because it has no data to transmit on a UL in (n+4)-th frame. That is, because the type of a UL grant is an Explicit UL grant, the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL...". This also implicitly means that generating transport block is skipped. The same holds **for dependent claim 10.** Therefore, the subject matter of **dependent claims 3 and 10** is not novel.

- **Claim 4: D1** discloses(paragraphs [0063]-[0066], figure 4) " ...the UE 211 determines in block 411 whether **HARQ feedback information** is received from the eNB 213...the UE 211 determines in block 425 whether the received HARQ feedback information is a HARQ ACK. If the received HARQ feedback information is not a HARQ ACK but a HARQ NACK, the UE 211 initializes a retransmission process of the HARQ process being performed on the previously transmitted data in block 427. However, if it is determined in block 425 that the received HARQ feedback information is a HARQ ACK, the UE 211 proceeds to block 417... Even though the UE transmits no padding MAC PDUs, the HARQ process **between the UE and the eNB** may be normally performed.....". The same holds **for dependent claims 11, 19 and 23.** Therefore, the subject matter of **dependent claims 4, 11, 19 and 23** is not novel.

- **Claims 6, 20: D1** discloses (paragraphs [0054]-[0055], figures 1-2) " ...**eNB 213 sets** a value of a New Data Indicator (NDI) for a Hybrid Automatic Retransmission Request (HARQ) process x to '0', and **allocates an Explicit UL grant for the HARQ process x to a UE** 211 in an n-th frame in step 215. ... Because the eNB 213 has received no data from the UE 211 even though it allocated the Explicit UL grant in the n-th frame, the eNB 213 sets a value of the NDI to '1' and allocates an Explicit UL grant for the HARQ process x to the UE 211...". The same holds **for dependent claims 13 and 24.** Therefore, the subject matter of **dependent claims 6, 13, 20 and 24** is not novel.

- **Claim 7: D1** discloses (paragraphs [0018]-[0019], [0026], [0032], [0058], figures 3, 9, 11) "... The eNB includes a resource allocation unit that allocates an Explicit Uplink (UL) grant under specific control....", " ...**the eNB 213 determines** in block 311 whether data is detected from an allocated Explicit UL grant..." and also "...the eNB includes a control unit 1111, a resource allocation unit 1113, a transmission unit 1115, and a reception unit 1117....". The same holds **for dependent claims 14, 21 and 25.** Therefore, the subject matter of **dependent claims 7, 14, 21 and 25** is not novel.

- **Claim 15: D1** discloses(paragraphs [0017], [0116]-[0119]) " ...a user equipment (UE) for a mobile communication system. The UE includes a control unit detects a type of an uplink (UL) grant while

Continued to next page

ASUS EX2019-p.79
Samsung v. ASUS
IPR2024-00614

Supplemental Box

Continuation of: Box V (4 / 4)

the UE is periodically allocated a UL grant.....” and also “...the UE includes a control unit 1211, a transmission unit 1213, and a reception unit 1215...”. Therefore, the subject matter of **dependent claim 15** is not novel.

- **Claim 17: D1** disclose methods according to any of **claims 2-7** for an apparatus according to claim 16, therefore, the subject matter of **dependent claim 17** is not novel.

- **Claim 27: D1** disclose methods according to **claims 19, 20** for an apparatus according to claim 26, therefore, the subject matter of **dependent claim 27** is not novel.

As a summary, D1 discloses the additional features of **dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27.** Therefore, the subject matter of dependent claims **2-7, 9-15, 17, 19-21, 23-25 and 27** is not novel.

2.4 Inventive step under PCT Article 33(3)

2.4.1 Independent claims
The subject matter of independent **claims 1, 8, 16, 18, 22, 26 and 28** is not novel and therefore it does not involve an inventive step over the prior art.

2.4.2 Dependent claims

The subject matter of **dependent claims 2-7, 9-15, 17, 19-21, 23-25 and 27** is not novel and therefore it does not involve an inventive step over the prior art.

2.5 Industrial applicability under PCT Article 33(4)

Claims 1-28 meet the requirement of industrial applicability because the claimed subject matter can be made or used in industry.

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims are not drafted in the two-part form in accordance with PCT Rule 6.3(b), which in the present case would be appropriate, with those features known from the prior art placed in the preamble (PCT Rule 6.3(b)(i)) and the remaining features included in the characterising part (PCT Rule 6.3(b)(ii)).

The features of the claims are not provided with reference signs placed in parentheses (PCT Rule 6.2(b)).

To meet the requirements of PCT Rule 5.1(a)(ii), the most relevant prior art, i.e. document D1, should be referred to and briefly discussed in the introductory part of the description, preferably so that the inventive merit of the claimed invention can be easily understood.

ASUS EX2019-p.81
Samsung v. ASUS
IPR2024-00614

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/FI2017/050343

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Although claims 8 and 16, 22 and 26 have been drafted as separate independent claims, they seem to relate effectively to the same subject matter and to differ from each other only with regard to the definition of the subject matter for which protection is sought and in respect of the terminology used for the features of that subject matter. The above claims therefore lack conciseness and as such do not meet the requirements of PCT Article 6.

ASUS EX2019-p.82
Samsung v. ASUS
IPR2024-00614

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**

Continuation of: International Patent Classification (IPC)

IPC
H04W 72/12 (2009.01)
H04W 72/04 (2009.01)
H04W 24/02 (2009.01)

ASUS EX2019-p.83
Samsung v. ASUS
IPR2024-00614

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant´s or agent´s file reference NC101437WO	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/FI2017/050343	International filing date *(day/month/year)* 04 May 2017 (04.05.2017)	(Earliest) Priority date *(day/month/year)* 12 May 2016 (12.05.2016)
Applicant NOKIA TECHNOLOGIES OY		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      ☒ the international application in the language in which it was filed.
      ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*ter*)(a)).
   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II).
3. ☐ **Unity of invention is lacking** (See Box No. III).
4. With regard to the **title**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the **drawings**,
   a. the figure of the **drawings** to be published with the abstract is Figure No. 3a
      ☐ as suggested by the applicant.
      ☒ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

ASUS EX2019-p.84
Samsung v. ASUS
IPR2024-00614

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2017/050343

A. **CLASSIFICATION OF SUBJECT MATTER**

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: H04W, H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

FI, SE, NO, DK

Electronic data base consulted during the international search (name of data base, and, where practicable, search terms used)

EPODOC, EPO-Internal full-text databases, WPIAP, XP3GPP, XPAIP, XPESP, XPETSI, XPI3E, XPIEE, XPIETF, XPIOP, XPIPCOM, XPJPEG, XPMISC, XPOAC, XPRD, XPTK, COMPDX, INSPEC, NPL, Internet, ESPACENET

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011310833 A1 (LEE OK-SEON [KR] et al.) 22 December 2011 (22.12.2011) Abstract, paragraphs [0013]-[0021], [0026], [0032], [0040]-[0042], [0046]-[0055], [0058], [0063]-[0066], [0080]-[0081], [0116]-[0119], figures 1-4, 6, 9, 11-12	1-28
A	3GPP, Report of 3GPP TSG RAN WG2 meeting #91, R2-154032, in Beijing, China, 24-28 August 2015. In: [online], 2015-10-09, [retrieved on 2017-08-15]. Retrieved from <http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_91bis/Docs/R2-154032.zip>, chapter 7.11	1-28
A	US 2012230232 A1 (JI HYOUNGJU [KR] et al.) 13 September 2012 (13.09.2012) The whole document	1-28

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 August 2017 (15.08.2017)	17 August 2017 (17.08.2017)

Name and mailing address of the ISA/FI	Authorized officer
Finnish Patent and Registration Office P.O. Box 1160, FI-00101 HELSINKI, Finland	Harald Kaaja
Facsimile No. +358 29 509 5328	Telephone No. +358 29 509 5000

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2017/050343

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Nokia; Alcatel-Lucent Shanghai Bell: Skipping empty BSR and feedback for SPS activation/deactivation, 3GPP TSG-RAN WG2 Meeting #93bis, R2-162504, in Dubrovnik, Croatia, 11-15 April 2016. In: [online], 2016-04-02, [retrieved on 2017-08-15]. Retrieved from <http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_93bis/Docs/R2-162504.zip>, The whole document.	1-28
A	Samsung: Skipping uplink transmission with no data to transmit, 3GPP TSG-RAN WG2 Meeting #91, R2-153332, in Beijing, China, 24-28 August 2015. In: [online], 2015-08-14, [retrieved on 2017-08-15]. Retrieved from <http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_91/Docs/R2-153332.zip>, The whole document.	1-28

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on Patent Family Members

International application No.
PCT/FI2017/050343

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 2011310833 A1	22/12/2011	US 9414403 B2	09/08/2016
		EP 2583389 A2	24/04/2013
		KR 20110138687 A	28/12/2011
		KR 101721015 B1	29/03/2017
		US 2016309501 A1	20/10/2016
		WO 2011162502 A2	29/12/2011
US 2012230232 A1	13/09/2012	CN 103416011 A	27/11/2013
		EP 2498419 A2	12/09/2012
		EP 2498419 B1	11/05/2016
		EP 3051713 A1	03/08/2016
		JP 2014514797 A	19/06/2014
		KR 20120103200 A	19/09/2012
		WO 2012121574 A2	13/09/2012

ASUS EX2019-p.87
Samsung v. ASUS
IPR2024-00614

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2017/050343

CLASSIFICATION OF SUBJECT MATTER

IPC
H04W 72/12 (2009.01)
H04W 72/04 (2009.01)
H04W 24/02 (2009.01)

Form PCT/ISA/210 (extra sheet)

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Filer:	Nico Johannes van Waes/Sandy Fong
Attorney Docket Number:	NC101437-US-PCT

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
NATIONAL STAGE FEE	1631	1	300	300
NATL STAGE SEARCH FEE - REPORT PROVIDED	1642	1	520	520
NATIONAL STAGE EXAM - ALL OTHER CASES	1633	1	760	760
Pages:				
Claims:				
INDEPENDENT CLAIMS IN EXCESS OF 3	1614	1	460	460
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2040**

Electronic Acknowledgement Receipt

EFS ID:	34230921
Application Number:	16099421
International Application Number:	PCT/FI2017/050343
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	73658
Filer:	Nico Johannes van Waes/Sandy Fong
Filer Authorized By:	Nico Johannes van Waes
Attorney Docket Number:	NC101437-US-PCT
Receipt Date:	06-NOV-2018
Filing Date:	
Time Stamp:	19:06:09
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$2040
RAM confirmation Number	110718INTEFSW00005489500270
Deposit Account	500270
Authorized User	Sandy Hou
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 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)

37 CFR 1.492 (National application filing, search, and examination fees)

37 CFR 1.492(a) (Basic national fee only)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	101437US_371_Transmittal.pdf	249850 3106208198b2ed89ae7b56f7bee86c318185eb20	no	4
Warnings:					
Information:					
2	Application Data Sheet	101437US_ADS.pdf	1822962 b76c052324fb63d0c15684960d285406400cec49	no	8
Warnings:					
Information:					
3		101437US_Prelim.pdf	35834 ad0835f80b553e586b8025243b30f02973dfe237	yes	6

Multipart Description/PDF files in .zip description

Document Description	Start	End
Preliminary Amendment	1	1
Specification	2	2
Claims	3	5
Applicant Arguments/Remarks Made in an Amendment	6	6

Warnings:					
Information:					
4	Oath or Declaration filed	101437_Executed_DECLARATION.pdf	24793 89b189c025945b6ed5b11ecd471b1f35579122ce	no	1
Warnings:					

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

5	Power of Attorney	101437_POA.pdf	2372777 882282527a460bedcdd434dbdcbd088a7d899cea	no	5
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
6	Assignee showing of ownership per 37 CFR 3.73	101437_373.pdf	2041124 2169f911bbb1ebeae5638fd03b002fcac6e967c7	no	4
Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Form (SB08)	101437_IDS.pdf	613205 bf544e2a62142a971371657785e04807ebbc892f	no	5
Warnings:					
Information:					
8	Foreign Reference	FOR_1_EP2802187.pdf	1887263 21862cedb5d2deff87cfcd43545bdb47d1698fbd	no	28
Warnings:					
Information:					
9	Other Reference-Patent/App/Search documents	NPL_5_PCTFI2017050343_ISR_08_17_2017.pdf	375883 89ba3eb0d3618654a900b82834b5f912c6b1cdaa	no	16
Warnings:					
Information:					
10	Non Patent Literature	NPL_8_R2-153332.pdf	48696 d55efebc7bd0ee996c32392386c71777da30df11	no	2
Warnings:					
Information:					
11	Non Patent Literature	NPL_9.pdf	881189 0507c286daf7843befdc9c9485fd4a3d8d82f7b0	no	85
Warnings:					
Information:					

12	Non Patent Literature	NPL_1_Open_Issues_.pdf	163927 f5677a3385dda582a5a563969ff96aba369106a7	no	2
Warnings:					
Information:					
13	Non Patent Literature	NPL_2_3GPP_TS_36_212_.pdf	1770343 27b5a4b3de39aca0d9c5a52f91b90f5861785d70	no	129
Warnings:					
Information:					
14	Non Patent Literature	NPL_3_3GPP_TS_36_213_.pdf	4766087 da9013e2945d13e1ed2ca208c5f13095b1616897	no	361
Warnings:					
Information:					
15	Non Patent Literature	NPL_4_3GPP_TR_36_814_.pdf	1376187 5c4b4d0cbd3b4f263a40b10a91f7dc45fe33b767	no	104
Warnings:					
Information:					
16	Non Patent Literature	NPL_6_Report_.pdf	2254270 941c4470b10f1da238018533cfe108577e9408e3	no	163
Warnings:					
Information:					
17	Non Patent Literature	NPL_7_Skipping_Empty_.pdf	257571 963102cd8ee7530423468deffc9e13e6540f3736	no	8
Warnings:					
Information:					
18	Fee Worksheet (SB06)	fee-info.pdf	36858 5bd5296993583cd27942513a1b79528a3ca6fe3e	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	20978819	

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.

Sheet No. .....

Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the following standardized wording provided for in Section 214: see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.

Declaration of inventorship (Rules 4.17(iv) and 51*bis*.1(a)(iv)) for the purposes of the designation of the United States of America:

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

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/ FI2017/050343 (if furnishing declaration pursuant to Rule 26*ter*).

I hereby declare that the above-identified international application was made or authorized to be made by me.

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.

Name: Wu, Chunli

Residence: Beijing, China
(city and either US state, if applicable, or country)

Mailing Address: 12-5-301, Huihuayuan, Huilongguan, Changping District

Beijing, 102208

China

Inventor's Signature: Chunli Wu Date: 2017.5.9
(The signature must be that of the inventor, not that of the agent)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Inventor's Signature: Date:
(The signature must be that of the inventor, not that of the agent)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Inventor's Signature: Date:
(The signature must be that of the inventor, not that of the agent)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

ASUS EX2019-p.96
Samsung v. ASUS
IPR2024-00614

PCT REQUEST

Print Out (Original in Electronic Form)

0	**For receiving Office use only**	
0-1	International Application No.	PCT/FI2017/050343
0-2	International Filing Date	04 May 2017 (04.05.2017)
0-3	Name of receiving Office and "PCT International Application"	RO/FI

0-4	**Form PCT/RO/101 PCT Request**	
0-4-1	Prepared Using	PCT Online Filing Version 3.5.000.251e MT/FOP 20141031/0.20.5.20
0-5	**Petition** The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	Finnish Patent and Registration Office (PRH) (RO/FI)
0-7	**Applicant's or agent's file reference**	NC101437WO
I	**Title of Invention**	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
II	**Applicant**	
II-1	This person is	Applicant only
II-2	Applicant for	All designated States
II-4	Name	NOKIA TECHNOLOGIES OY
II-5	Address	Karaportti 3 02610 Espoo Finland
II-6	State of nationality	FI
II-7	State of residence	FI
II-8	Telephone No.	+358 10 448 8000
II-9	Facsimile No.	+358 10 448 1000
II-10	e-mail	ipr.inhouse@nokia.com
II-10(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	as advance copies followed by paper notifications

PCT REQUEST

Print Out (Original in Electronic Form)

III-1	**Applicant and/or inventor**	
III-1-1	This person is	Inventor only
III-1-3	Inventor for	All designated States
III-1-4	Name (LAST, First)	WU, Chunli
III-1-5	Address	12-5-301, Huihuayuan, Huilongguan, Changping District Beijing, 102208 China
IV-1	**Agent or common representative; or address for correspondence**	
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	Agent
IV-1-1	Name	NOKIA TECHNOLOGIES OY
IV-1-2	Address	Ari Aarnio IPR Department Karakaari 7 02610 Espoo Finland
IV-1-3	Telephone No.	+358 10 448 8000
IV-1-4	Facsimile No.	+358 10 448 1000
IV-1-5	e-mail	ipr.inhouse@nokia.com
IV-1-5(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	as advance copies followed by paper notifications
IV-2	**Additional agent(s)**	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	UUSITALO, Arttu
V	**DESIGNATIONS**	
V-1	**The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.**	
VI-1	**Priority claim of earlier national application**	
VI-1-1	Filing date	12 May 2016 (12.05.2016)
VI-1-2	Number	62/335,280
VI-1-3	Country or Member of WTO	US

PCT REQUEST

Print Out (Original in Electronic Form)

VI-2	**Priority document request** The International Bureau is requested to obtain from a digital library a certified copy of the earlier application(s) identified above as item(s), using, where applicable, the access code(s) indicated:	VI-1 Access code: 1229	
VI-3	**Incorporation by reference :** where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.		
VII-1	**International Searching Authority Chosen**	Finnish Patent and Registration Office (PRH) (ISA/FI)	
VIII	**Declarations**	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	–	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	–	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	–	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	–	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	–	
IX	**Check list**	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	4	✓
IX-2	Description	16	✓
IX-3	Claims	5	✓
IX-4	Abstract	1	✓
IX-5	Drawings	3	✓
IX-7	TOTAL	29	
	Accompanying Items	Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	–	✓
IX-19	Other	Pre-conversion archive	✓
IX-20	**Figure of the drawings which should accompany the abstract**		
IX-21	**Language of filing of the international application**	English	

PCT REQUEST

Print Out (Original in Electronic Form)

X-1	**Signature of applicant, agent or common representative**	/Ari Aarnio/
X-1-1	Name	NOKIA TECHNOLOGIES OY
X-1-2	Name of signatory	Ari Aarnio
X-1-3	Capacity (if such capacity is not obvious from reading the request)	(Representative)

FOR RECEIVING OFFICE USE ONLY

10-1	**Date of actual receipt of the purported international application**	04 May 2017 (04.05.2017)
10-2	**Drawings:**	
10-2-1	Received	
10-2-2	Not received	
10-3	**Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application**	
10-4	**Date of timely receipt of the required corrections under PCT Article 11(2)**	
10-5	**International Searching Authority**	ISA/FI
10-6	**Transmittal of search copy delayed until search fee is paid**	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	**Date of receipt of the record copy by the International Bureau**	

Digital Access Service
(DAS)

WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

CERTIFICATE OF AVAILABILITY OF A CERTIFIED PATENT DOCUMENT IN A DIGITAL LIBRARY

The International Bureau certifies that a copy of the patent application indicated below has been available to the WIPO Digital Access Service since the date of availability indicated, and that the patent application has been available to the indicated Office(s) as of the date specified following the relevant Office code:

Document details: Country/Office: US
Filing date: 12 May 2016 (12.05.2016)
Application number: 62335280

Date of availability of document: 02 Jun 2016 (02.06.2016)

The following Offices can retrieve this document by using the access code:
JP, US, SE, NZ, KR, GB, AU, ES, IB, EE, CN, MA, FI

Date of issue of this certificate: 18 May 2017 (18.05.2017)

34, chemin des Colombettes
1211 Geneva 20, Switzerland
www.wipo.int

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

May 18, 2017

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: *62/335,280*
FILING DATE: *May 12, 2016*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US62/335,280*

Certified by

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	CHUNLI		WU	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Beijing	Country of Residence [i]	CN

Mailing Address of Inventor:

Address 1	12-5-301 Huihuayuan, Huilongguan		
Address 2	Changping District		
City	Beijing	**State/Province**	OT
Postal Code	102208	**Country** [i]	CN

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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	11051		
Email Address	ipgeneraltyc@squirepb.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION		
Attorney Docket Number	059864.02406	**Small Entity Status Claimed**	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	3	**Suggested Figure for Publication (if any)**	

WEB ADS 1.0

PTO/AIA/14 (08-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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	11051		

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix	Remove
Registration Number					
Prefix	**Given Name**	Middle Name	**Family Name**	Suffix	Remove
Registration Number					

Additional Representative Information blocks may be generated within this form by selecting the **Add** button.

PTO/AIA/14 (08-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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 this 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 blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

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

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

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

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

PTO/AIA/14 (08-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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 (08-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

Applicant Information:

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

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:	
If the Applicant is an Organization check here.	☒
Organization Name	NOKIA TECHNOLOGIES OY

Mailing Address Information For Applicant:

Address 1	Karaportti 3		
Address 2			
City	Espoo	**State/Province**	OT
Country[i]	FI	Postal Code	02610
Phone Number		Fax Number	
Email Address			

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

PTO/AIA/14 (08-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

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.

Assignee 1

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

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

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

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

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

PTO/AIA/14 (08-15)
Approved for use through 04/30/2017. 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 contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	059864.02406
	Application Number	
Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION	

Signature:

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

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

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

Signature	/Douglas Goldhush/			Date (YYYY-MM-DD)	
First Name	Douglas	Last Name	Goldhush	Registration Number	33125

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

METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

BACKGROUND:

Field:

[0001] Embodiments of the invention generally relate to wireless or mobile communications networks, such as, but not limited to, the Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN), Long Term Evolution (LTE) Evolved UTRAN (E-UTRAN), LTE-Advanced (LTE-A), LTE-Advanced Pro, LTE-M, and/or 5G radio access technology. Some embodiments may relate to methods and apparatuses for possibly skipping transport block (TB) transmission depending on uplink control information (UCI) transmission.

Description of the Related Art:

[0002] Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN) refers to a communications network including base stations or Node Bs, and, for example, radio network controllers (RNC). UTRAN allows for connectivity between the user equipment (UE) and the core network. The RNC provides control functionalities for one or more Node Bs. The RNC and its corresponding Node Bs are called the Radio Network Subsystem (RNS). In case of E-UTRAN (enhanced UTRAN), no RNC exists and radio access functionality is provided by an evolved Node B (eNodeB or eNB) or many eNBs. Multiple eNBs are involved for a single UE connection, for example, in case of Coordinated Multipoint Transmission (CoMP) and in dual connectivity.

[0003] Long Term Evolution (LTE) or E-UTRAN provides a new radio access technology and refers to the improvements of UMTS through improved efficiency and services, lower costs, and use of new spectrum

opportunities. In particular, LTE is a 3GPP standard that provides for uplink peak rates of at least, for example, 75 megabits per second (Mbps) per carrier and downlink peak rates of at least, for example, 300 Mbps per carrier. LTE supports scalable carrier bandwidths from 20 MHz down to 1.4 MHz and supports both Frequency Division Duplexing (FDD) and Time Division Duplexing (TDD).

[0004] As mentioned above, LTE may also improve spectral efficiency in networks, allowing carriers to provide more data and voice services over a given bandwidth. Therefore, LTE is designed to fulfill the needs for high-speed data and media transport in addition to high-capacity voice support. Advantages of LTE include, for example, high throughput, low latency, FDD and TDD support in the same platform, an improved end-user experience, and a simple architecture resulting in low operating costs.

[0005] Certain releases of 3GPP LTE (e.g., LTE Rel-10, LTE Rel-11, LTE Rel-12, LTE Rel-13) are targeted towards international mobile telecommunications advanced (IMT-A) systems, referred to herein for convenience simply as LTE-Advanced (LTE-A).

[0006] LTE-A is directed toward extending and optimizing the 3GPP LTE radio access technologies. A goal of LTE-A is to provide significantly enhanced services by means of higher data rates and lower latency with reduced cost. LTE-A is a more optimized radio system fulfilling the international telecommunication union-radio (ITU-R) requirements for IMT-Advanced while keeping the backward compatibility.

[0007] 5th generation wireless systems (5G) refers to the new generation of radio systems and network architecture. 5G is expected to provide higher bitrates and coverage as well as decreased latency than the current LTE systems. Some estimate that 5G will provide bitrates one hundred times higher than LTE offers. 5G is also expected to increase network expandability up to hundreds of thousands of connections. The signal technology of 5G is anticipated to be improved for greater coverage and

further reduced latency as well as spectral and signaling efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS:

[0008] For proper understanding of the invention, reference should be made to the accompanying drawings, wherein:

[0009] Fig. 1 illustrates a block diagram depicting Transport block processing for UL-SCH;

[0010] Fig. 2a illustrates a block diagram of an apparatus, according to an embodiment;

[0011] Fig. 2b illustrates a block diagram of an apparatus, according to another embodiment;

[0012] Fig. 3a illustrates a flow chart of a method, according to one embodiment; and

[0013] Fig. 3b illustrates a flow chart of a method, according to another embodiment.

DETAILED DESCRIPTION:

[0014] It will be readily understood that the components of the invention, as generally described and illustrated in the figures herein, may be arranged and designed in a wide variety of different configurations. Thus, the following detailed description of embodiments of systems, methods, apparatuses, and computer program products for skipping TB transmission depending on UCI transmission, as represented in the attached figures, is not intended to limit the scope of the invention, but is merely representative of some selected embodiments of the invention.

[0015] The features, structures, or characteristics of the invention described throughout this specification may be combined in any suitable manner in one or more embodiments. For example, the usage of the phrases "certain embodiments," "some embodiments," or other similar language,

throughout this specification refers to the fact that a particular feature, structure, or characteristic described in connection with the embodiment may be included in at least one embodiment of the present invention. Thus, appearances of the phrases "in certain embodiments," "in some embodiments," "in other embodiments," or other similar language, throughout this specification do not necessarily all refer to the same group of embodiments, and the described features, structures, or characteristics may be combined in any suitable manner in one or more embodiments.

[0016] Additionally, if desired, the different functions discussed below may be performed in a different order and/or concurrently with each other. Furthermore, if desired, one or more of the described functions may be optional or may be combined. As such, the following description should be considered as merely illustrative of the principles, teachings and embodiments of this invention, and not in limitation thereof.

[0017] Certain embodiments relate to L2 latency reduction techniques for LTE. A Rel-14 work item (WI) on latency reduction was agreed in RAN #71 with the objective to specify L2 latency enhancements as identified in RAN2, which may include the introduction of short semi-persistent scheduling (SPS) period to allow uplink (UL) prescheduling, the reduction of padding in case of dynamic and SPS based UL pre-scheduling to reduce interference and UE power consumption, and further discussion on the introduction of feedback for SPS activation, reactivation and deactivation command.

[0018] According to an embodiment, the UE can be configured to skip UL transmission which only contains padding buffer status report (BSR) when there is no UL data in the buffer to be transmitted.

[0019] Currently, when there is Physical Uplink Shared Channel (PUSCH) allocation, UCI will be sent on PUSCH, multiplexed and interleaved with data according to 3GPP technical specifications (TS) 36.213 and 36.212. In 3GPP TS 36.213 section 7.2, it is specified that: "if a UE is

not configured for simultaneous PUSCH and physical uplink control channel (PUCCH) transmission, it shall transmit periodic CSI reporting on PUCCH as defined hereafter in subframes with no PUSCH allocation…If a UE is not configured for simultaneous PUSCH and PUCCH transmission, it shall transmit periodic CSI reporting on PUSCH of the serving cell with smallest *ServCellIndex* as defined hereafter in subframes with a PUSCH allocation, where the UE shall use the same PUCCH-based periodic CSI reporting format on PUSCH."

[0020] In 3GPP TS 36.212, section 5.2.2 deals with the uplink shared channel (UL-SCH) and transport block (TB) processing for the UL-SCH. Fig. 1 illustrates a block diagram depicting Transport block processing for UL-SCH, as provided in Fig. 5.2.2-1 of 3GPP TS 36.212.

[0021] However, it is not clear how UCI is handled if there is no TB generated from the medium access control (MAC) layer. Therefore, currently, there is no resolution or approach for whether UCI should be sent on PUCCH or PUSCH when MAC does not generate a TB when it does not have UL data in the buffer.

[0022] In view of the above, an embodiment of the invention includes that, if skipping uplink transmission with only padding BSR is configured, for the subframe with UL grant and there is UCI transmission, MAC should generate the TB. In other words, the TB with padding BSR only is not skipped if the subframe is configured with periodic channel quality indicator (CQI), or aperiodic CQI requested for that subframe, or hybrid automatic repeat request (HARQ) feedback is to be sent on that subframe.

[0023] Alternatively, in another embodiment, if there is an UL grant and MAC does not generate TB because it does not have UL data to be transmitted, UCI is sent on PUSCH as if the grant is an UCI only grant following the description in 3GPP 36.212 section 5.2.4, even though the grant is intended for data with UCI.

[0024] According to yet another embodiment, if there is an UL grant and MAC does not generate TB because it does not have UL data to be transmitted, UCI is sent on PUCCH even if the UE has PUSCH allocation.

[0025] In one example embodiment, when the UE is configured with skipping UL transmission with only padding BSR and when no UL data: for the subframe with UL grant and UCI transmission (when there is periodic CQI configured in that subframe, or aperiodic CQI required for the subframe, or HARQ feedback is to be transmitted in that subframe), MAC always generates the TB even if it only contains padding BSR indicating Buffer status equals to 0. With this, there would be no impact to physical layer (PHY).

[0026] According to an embodiment, if MAC does not provide the TB when there is UCI transmission, PHY may need to generate some dummy data then mute them and send UCI only on the allocated PUSCH resource. Alternatively, the UL grant may be used to send UCI only following the description in 3GPP TS 36.212 section 5.2.4. This may require double decoding at the eNB side for UCI only and UCI with data on PUSCH, as well as some changes in PHY is expected to allow UL grant for data to be used for UCI only, as currently CQI only grant has specific format.

[0027] Another embodiment may include sending UCI on PUCCH when MAC does not generate any TB. This may require double decoding at the eNB though for UCI on PUCCH or UCI with data on PUSCH depending on whether there is UL data to be transmitted. Double decoding is likely already supported by eNB implementation to handle the case of PDCCH for UL grant lost. Some modifications to the 3GPP specification (e.g. 36.213) may be needed so that CQI on PUSCH or PUCCH should not be based on PUSCH allocation, but to allow it to be sent on PUCCH when MAC does not generate a TB.

[0028] Fig. 2a illustrates an example of an apparatus 10 according to an embodiment. In an embodiment, apparatus 10 may be a node, host, or server in a communications network or serving such a network. For example, apparatus 10 may be a network node or access node for a radio access network, such as a base station, node B or eNB, or an access node of 5G radio access technology. It should be noted that one of ordinary skill in the art would understand that apparatus 10 may include components or features not shown in Fig. 2a.

[0029] As illustrated in Fig. 2a, apparatus 10 may include a processor 22 for processing information and executing instructions or operations. Processor 22 may be any type of general or specific purpose processor. While a single processor 22 is shown in Fig. 2a, multiple processors may be utilized according to other embodiments. In fact, processor 22 may include one or more of general-purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), and processors based on a multi-core processor architecture, as examples.

[0030] Processor 22 may perform functions associated with the operation of apparatus 10 which may include, for example, precoding of antenna gain/phase parameters, encoding and decoding of individual bits forming a communication message, formatting of information, and overall control of the apparatus 10, including processes related to management of communication resources.

[0031] Apparatus 10 may further include or be coupled to a memory 14 (internal or external), which may be coupled to processor 22, for storing information and instructions that may be executed by processor 22. Memory 14 may be one or more memories and of any type suitable to the local application environment, and may be implemented using any suitable volatile or nonvolatile data storage technology such as a semiconductor-based memory device, a magnetic memory device and system, an optical

memory device and system, fixed memory, and removable memory. For example, memory 14 can be comprised of any combination of random access memory (RAM), read only memory (ROM), static storage such as a magnetic or optical disk, or any other type of non-transitory machine or computer readable media. The instructions stored in memory 14 may include program instructions or computer program code that, when executed by processor 22, enable the apparatus 10 to perform tasks as described herein.

[0032] In some embodiments, apparatus 10 may also include or be coupled to one or more antennas 25 for transmitting and receiving signals and/or data to and from apparatus 10. Apparatus 10 may further include or be coupled to a transceiver 28 configured to transmit and receive information. For instance, transceiver 28 may be configured to modulate information on to a carrier waveform for transmission by the antenna(s) 25 and demodulate information received via the antenna(s) 25 for further processing by other elements of apparatus 10. In other embodiments, transceiver 28 may be capable of transmitting and receiving signals or data directly.

[0033] In an embodiment, memory 14 may store software modules that provide functionality when executed by processor 22. The modules may include, for example, an operating system that provides operating system functionality for apparatus 10. The memory may also store one or more functional modules, such as an application or program, to provide additional functionality for apparatus 10. The components of apparatus 10 may be implemented in hardware, or as any suitable combination of hardware and software.

[0034] In one embodiment, apparatus 10 may be a network node or access node, such as a base station, node B, or eNB, or an access node of 5G, for example. According to one embodiment, apparatus 10 may be controlled by memory 14 and processor 22 to perform the functions associated with

embodiments described herein. For instance, in one embodiment, apparatus 10 may be controlled by memory 14 and processor 22 to configure one or more UEs to skip UL transmission when there is no UL data. For example, the configuring of the UE(s) may include apparatus 10 being controlled to transmit a configuration message indicating to the UE(s) to skip UL transmission when there is no UL data.

[0035] For each subframe/transmission time interval (TTI), apparatus 10 may be controlled by memory 14 and processor 22 to determine if there is UCI transmission in that TTI. If there is no UCI transmission in that TTI, apparatus 10 may be controlled by memory 14 and processor 22 to decode the PUSCH with data only or DTX detection when there is no UL transmission. If there is UCI transmission in that TTI, apparatus 10 may be controlled by memory 14 and processor 22 to decode the PUSCH as UCI with data TB.

[0036] Fig. 2b illustrates an example of an apparatus 20 according to another embodiment. In an embodiment, apparatus 20 may be a node or element in a communications network or associated with such a network, such as a UE, mobile device, mobile unit, or other device. For instance, in some embodiments, apparatus 20 may be UE in LTE, LTE-A, or 5G. It should be noted that one of ordinary skill in the art would understand that apparatus 20 may include components or features not shown in Fig. 2b.

[0037] As illustrated in Fig. 2b, apparatus 20 may include a processor 32 for processing information and executing instructions or operations. Processor 32 may be any type of general or specific purpose processor. While a single processor 32 is shown in Fig. 2b, multiple processors may be utilized according to other embodiments. In fact, processor 32 may include one or more of general-purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), and processors based on a multi-core processor architecture, as examples.

[0038] Processor 32 may perform functions associated with the operation of apparatus 20 including, without limitation, precoding of antenna gain/phase parameters, encoding and decoding of individual bits forming a communication message, formatting of information, and overall control of the apparatus 20, including processes related to management of communication resources.

[0039] Apparatus 20 may further include or be coupled to a memory 34 (internal or external), which may be coupled to processor 32, for storing information and instructions that may be executed by processor 32. Memory 34 may be one or more memories and of any type suitable to the local application environment, and may be implemented using any suitable volatile or nonvolatile data storage technology such as a semiconductor-based memory device, a magnetic memory device and system, an optical memory device and system, fixed memory, and removable memory. For example, memory 34 can be comprised of any combination of random access memory (RAM), read only memory (ROM), static storage such as a magnetic or optical disk, or any other type of non-transitory machine or computer readable media. The instructions stored in memory 34 may include program instructions or computer program code that, when executed by processor 32, enable the apparatus 20 to perform tasks as described herein.

[0040] In some embodiments, apparatus 20 may also include or be coupled to one or more antennas 35 for transmitting and receiving signals and/or data to and from apparatus 20. Apparatus 20 may further include a transceiver 38 configured to transmit and receive information. For instance, transceiver 38 may be configured to modulate information on to a carrier waveform for transmission by the antenna(s) 35 and demodulate information received via the antenna(s) 35 for further processing by other elements of apparatus 20. In other embodiments, transceiver 38 may be capable of transmitting and receiving signals or data directly.

[0041] In an embodiment, memory 34 stores software modules that provide functionality when executed by processor 32. The modules may include, for example, an operating system that provides operating system functionality for apparatus 20. The memory may also store one or more functional modules, such as an application or program, to provide additional functionality for apparatus 20. The components of apparatus 20 may be implemented in hardware, or as any suitable combination of hardware and software.

[0042] As mentioned above, according to one embodiment, apparatus 20 may be a mobile device, such as a UE. In this embodiment, apparatus 20 may be controlled by memory 34 and processor 32 to perform the functions associated with embodiments described herein. In one embodiment, apparatus 20 may be configured to skip UL transmission when there is no UL data. For example, according to an embodiment, apparatus 20 may be controlled by memory 34 and processor 32 to receive a configuration message, from a base station or eNB, to configure apparatus 20 to skip UL transmission when there is no UL data.

[0043] For each subframe/TTI, apparatus 20 may be controlled by memory 34 and processor 32 to check if there is UL data or MAC control element (CE) to be sent. If there is UL data or MAC CE to be sent, MAC generates the TB and it is delivered to PHY regardless of whether there is UL data to be transmitted. If there is no UL data or MAC CE to be sent, apparatus 20 may be controlled by memory 34 and processor 32 to check if there is UCI transmission in this TTI. If there is no UCI transmission in this TTI, generation of the TB is skipped and no TB is delivered to the PHY if there is no UL data to be transmitted. If there is UCI transmission in this TTI, MAC generates the TB and it is delivered to PHY.

[0044] Fig. 3a illustrates an example of a flow chart for a method, according to one embodiment. In certain embodiments, the method depicted in Fig. 3a may be performed by a base station or eNB, for example. As

illustrated in Fig. 3a, the method may include, at 300, configuring one or more UEs to skip UL transmission when there is no UL data. For example, the configuring of the UE(s) may include transmitting a configuration message indicating to the UE(s) to skip UL transmission when there is no UL data. For each subframe/TTI, the method may include, at 310, determining or checking whether there is UCI transmission in that TTI. If there is no UCI transmission in that TTI, then the method may include, at 320, decoding the PUSCH with data only or DTX detection when there is no UL transmission. If there is UCI transmission in that TTI, then the method may include, at 330, decoding the PUSCH as UCI with data TB.

[0045] Fig. 3b illustrates an example of a flow chart for a method, according to another embodiment. In certain embodiments, the method depicted in Fig. 3b may be performed by a mobile device or UE, for example. As illustrated in Fig. 3b, the method may include, at 350, receiving a configuration message, for example from a base station or eNB, indicating to skip UL transmission when there is no UL data. For each subframe/TTI, the method may include, at 360, checking or determining whether there is UL data or MAC control element (CE) to be sent. If there is UL data or MAC CE to be sent, the method may include, at 380, generating the TB and delivering it to PHY regardless of whether there is UL data to be transmitted. If there is no UL data or MAC CE to be sent, the method may further include, at 365, checking or determining whether there is UCI transmission in this TTI. If there is no UCI transmission in this TTI, the method may include, at 370, skipping generation of the TB and not delivering any TB to the PHY if there is no UL data to be transmitted. If there is UCI transmission in this TTI, the method may include, at 380, generating the TB and delivering it to PHY.

[0046] Embodiments of the invention provide several advantages and/or technical improvements. For example, the use of embodiments of the

invention can result in latency reduction and power savings, thereby improving the functioning of communications networks and their nodes.

[0047] In some embodiments, the functionality of any of the methods, processes, or flow charts described herein may be implemented by software and/or computer program code or portions of it stored in memory or other computer readable or tangible media, and executed by a processor. In some embodiments, the apparatus may be, included or be associated with at least one software application, module, unit or entity configured as arithmetic operation(s), or as a program or portions of it (including an added or updated software routine), executed by at least one operation processor. Programs, also called program products or computer programs, including software routines, applets and macros, may be stored in any apparatus-readable data storage medium and they include program instructions to perform particular tasks. A computer program product may comprise one or more computer-executable components which, when the program is run, are configured to carry out embodiments. The one or more computer-executable components may be at least one software code or portions of it. Modifications and configurations required for implementing functionality of an embodiment may be performed as routine(s), which may be implemented as added or updated software routine(s). Software routine(s) may be downloaded into the apparatus.

[0048] Software or a computer program code or portions of it may be in a source code form, object code form, or in some intermediate form, and it may be stored in some sort of carrier, distribution medium, or computer readable medium, which may be any entity or device capable of carrying the program. Such carriers include a record medium, computer memory, read-only memory, photoelectrical and/or electrical carrier signal, telecommunications signal, and software distribution package, for example. Depending on the processing power needed, the computer program may be executed in a single electronic digital computer or it may be distributed

amongst a number of computers. The computer readable medium or computer readable storage medium may be a non-transitory medium.

[0049] In other embodiments, the functionality may be performed by hardware, for example through the use of an application specific integrated circuit (ASIC), a programmable gate array (PGA), a field programmable gate array (FPGA), or any other combination of hardware and software. In yet another embodiment, the functionality may be implemented as a signal, a non-tangible means that can be carried by an electromagnetic signal downloaded from the Internet or other network.

[0050] According to an embodiment, an apparatus, such as a node, device, or a corresponding component, may be configured as a computer or a microprocessor, such as single-chip computer element, or as a chipset, including at least a memory for providing storage capacity used for arithmetic operation and an operation processor for executing the arithmetic operation.

[0051] One embodiment is directed to a method, which may be performed by a UE. The method may include receiving, by the UE, a configuration message from a base station or eNB. The configuration message may indicate to the UE a configuration of skipping UL transmission when there is no UL data. In response to receiving of the configuration message, the method may also include receiving (downlink) data/signal from the BS/eNB, and determining that the UE is configured/requested for periodic/aperiodic CQI or HARQ for a subframe with UL grant, regarding the received data/signal. Based on the determining, the method may also include generating a TB regardless of whether there is UL data to be transmitted and, consequently, not skipping padding BSR only PDU. The method may also include transmitting the TB to the BS regardless of whether there is UL data to be transmitted .

[0052] Another embodiment is directed to an apparatus, which may include at least one processor and at least one memory including computer

program code. The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to receive a configuration message from a base station or eNB. The configuration message may indicate to the apparatus a configuration of skipping UL transmission when there is no UL data. In response to receiving of the configuration message, the at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to receive (downlink) data/signal from the BS/eNB, and determine that the apparatus is configured/requested for periodic/aperiodic CQI or HARQ for a subframe with UL grant, regarding the received data/signal. Based on the determining, The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to generate a TB regardless of the whether there is UL data to be transmitted and, consequently, not skipping padding BSR only PDU. The at least one memory and the computer program code may be further configured, with the at least one processor, to cause the apparatus at least to transmit the TB to the BS regardless of whether there is UL data to be transmitted .

[0053] Another embodiment is directed to a method, which may be performed by a base station or eNB. The method may include transmitting a configuration message for configuring at least one UE to skip UL transmission when there is no UL data. The method may further include transmitting a data/signal to the at least one UE. The method may then include receiving a TB for the subframe with UCI transmission regardless of the skipping UL transmission configuration.

[0054] Another embodiment is directed to an apparatus, which may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to transmit a configuration message for configuring at least one UE to skip

UL transmission when there is no UL data. The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to transmit a data/signal to the at least one UE, and to receive a TB for the subframe with UCI transmission regardless of the skipping UL transmission configuration.

[0055] One having ordinary skill in the art will readily understand that the invention as discussed above may be practiced with steps in a different order, and/or with hardware elements in configurations which are different than those which are disclosed. Therefore, although the invention has been described based upon these preferred embodiments, it would be apparent to those of skill in the art that certain modifications, variations, and alternative constructions would be apparent, while remaining within the spirit and scope of the invention.

ABSTRACT OF THE DISCLOSURE

Systems, methods, apparatuses, and computer program products for skipping TB transmission depending on UCI transmission are provided.

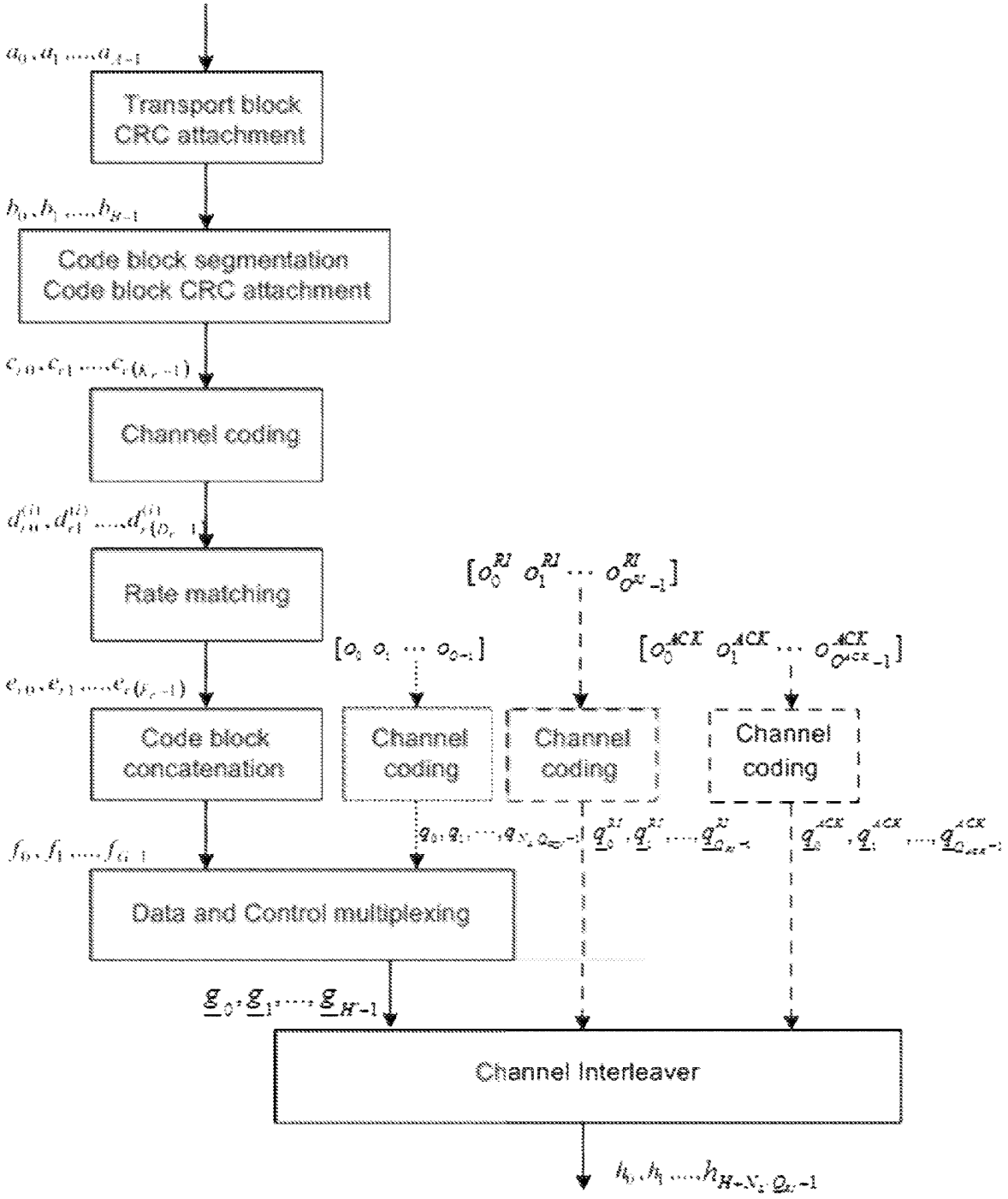

Transport block CRC attachment
Code block segmentation Code block CRC attachment
Channel coding
Rate matching
Code block concatenation
Channel coding
Channel coding
Channel coding
Data and Control multiplexing
Channel Interleaver

Fig. 1

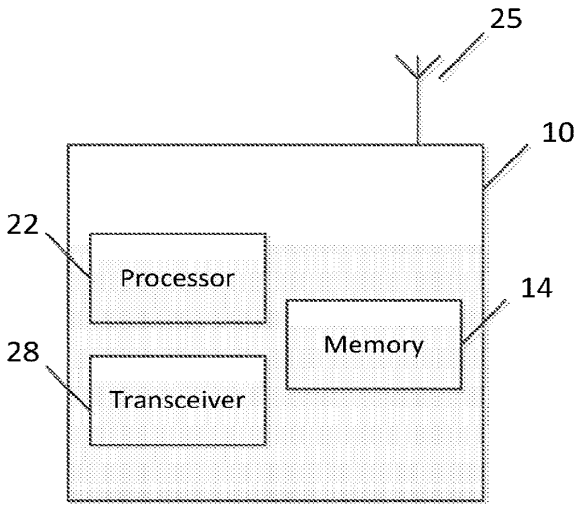

25
10
22
Processor
14
Memory
28
Transceiver

Fig. 2a

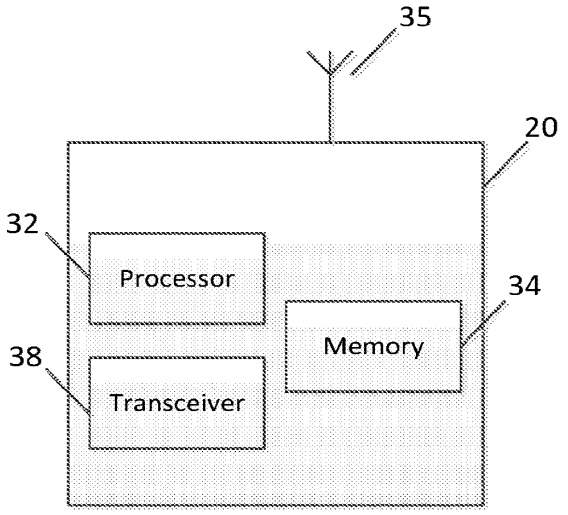

35
20
32
Processor
34
Memory
38
Transceiver

Fig. 2b

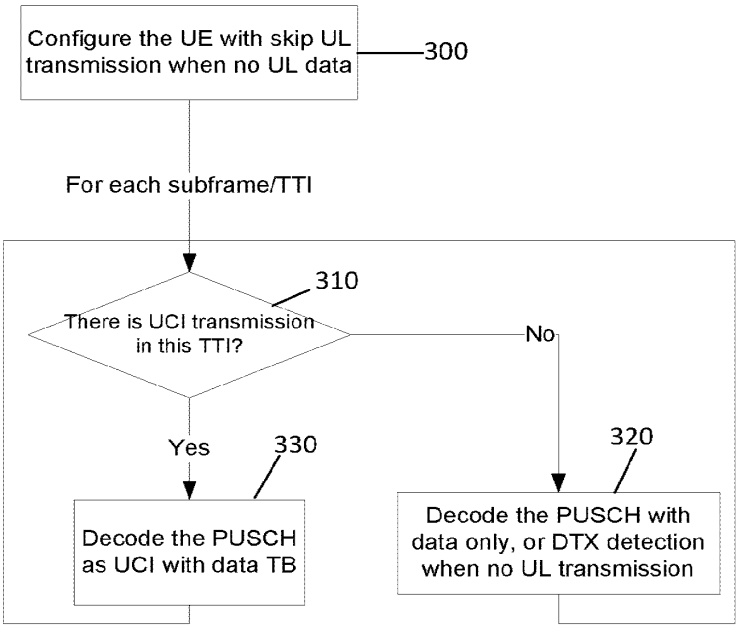

Configure the UE with skip UL transmission when no UL data
300
For each subframe/TTI
310
There is UCI transmission in this TTI?
No
Yes
330
320
Decode the PUSCH as UCI with data TB
Decode the PUSCH with data only, or DTX detection when no UL transmission

Fig. 3a

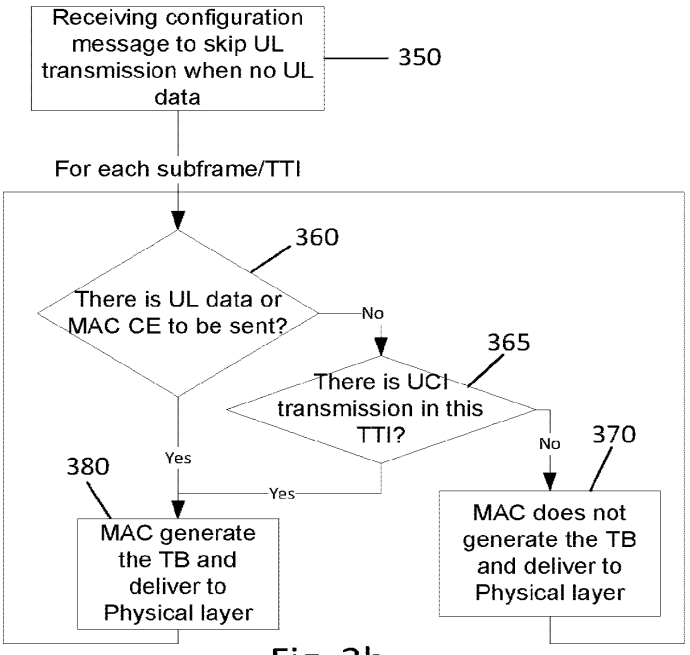

Receiving configuration message to skip UL transmission when no UL data
350
For each subframe/TTI
360
There is UL data or MAC CE to be sent?
No
365
There is UCI transmission in this TTI?
No
370
Yes
Yes
380
MAC generate the TB and deliver to Physical layer
MAC does not generate the TB and deliver to Physical layer

Fig. 3b

Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)
Approved for use through 05/31/2015. 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

Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1 — Remove

Given Name	Middle Name	Family Name	City	State	Country i
Chunli		WU	Beijing		CN

All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. — Add

Title of Invention	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
Attorney Docket Number (if applicable)	059864.02406

Correspondence Address

Direct all correspondence to (select one):

◉ The address corresponding to Customer Number	○ Firm or Individual Name
Customer Number	11051

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

- ● No.
- Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is:
- Yes, the invention was under a contract with an agency of the United States Government. The name of the U.S. Government agency and Government contract number are:

Doc Code: **TR.PROV**
Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (11-08)
Approved for use through 05/31/2015. 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

Entity Status
Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29

○	Applicant asserts small entity status under 37 CFR 1.27
○	Applicant certifies micro entity status under 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
◉	No

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 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 CFR1.14). 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.

Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Douglas H. Goldhush/			Date (YYYY-MM-DD)	2016-05-12
First Name	Douglas	Last Name	Goldhush	Registration Number (If appropriate)	33125

This collection of information is required by 37 CFR 1.51. 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 8 hours 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. **This form can only be used when in conjunction with EFS-Web. If this form is mailed to the USPTO, it may cause delays in handling the provisional application.**

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 paten. 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, t o a n other federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	25757623
Application Number:	62335280
International Application Number:	
Confirmation Number:	1229
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	CHUNLI WU
Customer Number:	11051
Filer:	Douglas Goldhush/Grace Trick
Filer Authorized By:	Douglas Goldhush
Attorney Docket Number:	059864.02406
Receipt Date:	12-MAY-2016
Filing Date:	
Time Stamp:	14:51:10
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$260
RAM confirmation Number	1154
Deposit Account	502222
Authorized User	CHAO, ABORN
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 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	Application Data Sheet	WebADS.pdf	114411 beddcc0d932671cda0679dc1342accae23000fd2	no	7
Warnings:					
Information:					
2		059864_02406_Application.pdf	172986 ae7c05ce0bb1e6b56c4949bc97cefe5858cc1f66	yes	17
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	16	
	Abstract		17	17	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	059864_02406_Drawings.pdf	873194 0bc67607ce65661b0d484d84ff4c5fca719661cc	no	3
Warnings:					
Information:					
4	Provisional Cover Sheet (SB16)	059864_02406-Provisional-Application-Transmittal.pdf	1485295 dc852302420d792c99d2d2e2345953383181aac0	no	3
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30233 457a7e612452a712695640ece9eb39098dfc4784	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2676119		

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.

WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

DOCUMENT MADE AVAILABLE UNDER THE PATENT COOPERATION TREATY (PCT)

International application number:		**PCT/FI2017/050343**
International filing date:		**04 May 2017 (04.05.2017)**
Document type:		**Certified copy of priority document**
Document details:	Country/Office:	**US**
	Number:	**62/335,280**
	Filing date:	**12 May 2016 (12.05.2016)**
Date of receipt at the International Bureau:		**18 May 2017 (18.05.2017)**

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a),(b) or (b-*bis*)

34, chemin des Colombettes
1211 Geneva 20, Switzerland
www.wipo.int

SEARCH RECORD

Title of invention: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

Application No: PCT/FI2017/050343

Priority application No:

Priority number	Date	Country
62/335,280	12.05.2016	US

Minimum documentation searched (classification system followed by classification):

CPC: H04L1/0026, H04L1/0031, H04L1/1671, H04L1/1812, H04L1/1829, H04L1/1861, H04L5/0098, H04W52/0209, H04W72/0413, H04W72/042, H04W72/1205, H04W72/1268, H04W72/1284, H04W72/1289, H04W74/008, H04W76/048.

IPC: H04W24/02, H04W24/10, H04W52/02, H04W72/04, H04W72/12, H04W72/14, H04W74/00, H04W88/02, H04W88/08, H04L1/18, H04L29/08.

Documentation searched other than minimum (FI,SE,NO,DK):

IPC: H04W24/02, H04W24/10, H04W52/02, H04W72/04, H04W72/12, H04W72/14, H04W74/00, H04W88/02, H04W88/08, H04L1/18, H04L29/08

Electronic data bases consulted during the the novelty search:

EPODOC, EPO-Internal full-text databases, WPIAP, XP3GPP, XPAIP, XPESP, XPETSI, XPI3E, XPIEE, XPIETF, XPIOP, XPIPCOM, XPJPEG, XPMISC, XPOAC, XPRD, XPTK, COMPDX, INSPEC, NPL, Internet, ESPACENET.

Language(s) in which the search was carried out:

English

Examiners consulted:

Verifying examiner Tapio Ikäheimo

Date	Examiner
15.08.2017	Harald Kaaja

The listing of the search history:

```
? SKIP+ AND (TRANSPORT+ 3D BLOCK+)
** SS 1: Results 4.793
? * AND (UPLINK+ 3D CONTROL+)
** SS 2: Results 1.291
? * AND HARQ+ AND FEEDBACK+
** SS 3: Results 660
? * CQI
** SS 4: Results 0
? 3 AND CQI+
** SS 5: Results 520
? * AND (CONFIG+ 3D SKIP+) AND (UPLINK+ OR UL)
** SS 6: Results 13
? LOGON
? ..FI PATENW
? (WU 3D CHUNLI+) /IN/PA
** SS 1: Results 835
? * AND NOKIA+ /IN/PA
** SS 2: Results 235
? 1 AND SKIP+ AND UPLINK+_CONTROL+
** SS 3: Results 0
? 1 AND UCI+
** SS 4: Results 9
? 1 AND UPLINK+_CONTROL+
** SS 5: Results 81
? * AND CQI+
** SS 6: Results 25
? * AND ARQ+
** SS 7: Results 3
? LOGON
? LOGON
? LOGON
? ..FI PATENW
? ..SKANDI
? ..FI EPODOC
? ..NOLIM
? (((H04L /ICA/IC.FLD) AND (PD>=1959 AND PD<=1968)) NOT ((H04L#?????? /ICA/IC.FLD) AND
(PD>=1959 AND PD<=1968))) OR ((H04W72/04 OR H04W72/12 OR H04W72/14 OR H04W721268 OR
H04W74/008 OR H04W52/0209 OR H04L1/1829 OR H04L1/1861) /ICA/IC.FLD)
** SS 1: Results 109.601
? * AND SE/PN {All SE documents}
** SS 2: Results 54
? *1 AND DK/PN {All DK documents}
** SS 3: Results 261
? *2 AND NO/PN {All NO documents}
** SS 4: Results 165
? *3 AND FI/PN {All FI documents}
** SS 5: Results 145
? *3 OR *2 OR *1 OR *
** SS 6: Results 625
? ..cr to wpiap
? ..FI WPIAP
? * AND (OR EP,WO,DE,GB,FR,AU,AT,US,CA)/PN
** SS 2: Results 2.745
? ..XT
? ..FI EPODOC
? *XT
** SS 7: Results 7.228
```


ASUS EX2019-p.138
Samsung v. ASUS
IPR2024-00614

```
? (*1 NOT * ) NOT (OR US,EP,WO,DE,GB,FR,AU,AT,CA)/PR
** SS 8: Results 31
? * AND SE/PN {Filtered SE documents}
** SS 9: Results 4
? *1 AND DK/PN {Filtered DK documents}
** SS 10: Results 16
? *2 AND NO/PN {Filtered NO documents}
** SS 11: Results 3
? *3 AND FI/PN {Filtered FI documents}
** SS 12: Results 8
? ..SKANDI
? ..FI EPODOC
? ..NOLIM
? (((H04L /ICA/IC.FLD) AND (PD>=1959 AND PD<=1968)) NOT ((H04L#?????? /ICA/IC.FLD) AND
(PD>=1959 AND PD<=1968))) OR ((H04W24/02 OR H04W24/10 OR H04W72/04 OR H04W88/02 OR
H04W88/08 OR H04L1/18 OR H04L29/08) /ICA/IC.FLD)
** SS 13: Results 448.615
? * AND SE/PN {All SE documents}
** SS 14: Results 363
? *1 AND DK/PN {All DK documents}
** SS 15: Results 746
? *2 AND NO/PN {All NO documents}
** SS 16: Results 613
? *3 AND FI/PN {All FI documents}
** SS 17: Results 766
? *3 OR *2 OR *1 OR *
** SS 18: Results 2.488
? ..cr to wpiap
? ..FI WPIAP
? * AND (OR EP,WO,DE,GB,FR,AU,AT,US,CA)/PN
** SS 4: Results 9.295
? ..XT
? ..FI EPODOC
? *XT
** SS 19: Results 20.992
? (*1 NOT * ) NOT (OR US,EP,WO,DE,GB,FR,AU,AT,CA)/PR
** SS 20: Results 125
? * AND SE/PN {Filtered SE documents}
** SS 21: Results 43
? *1 AND DK/PN {Filtered DK documents}
** SS 22: Results 27
? *2 AND NO/PN {Filtered NO documents}
** SS 23: Results 11
? *3 AND FI/PN {Filtered FI documents}
** SS 24: Results 44
? ..SKANDI
? ..FI EPODOC
? ..NOLIM
? (((H04L /ICA/IC.FLD) AND (PD>=1959 AND PD<=1968)) NOT ((H04L#?????? /ICA/IC.FLD) AND
(PD>=1959 AND PD<=1968))) OR ((H04W72/04 OR H04W72/12 OR H04W72/14 OR H04W74/00 OR
H04W52/02 OR H04L1/18 OR H04W24/02 OR H04W24/10 OR H04W72/04 OR H04W88/02 OR H04W88/08 OR
H04L1/18 OR H04L29/08) /ICA/IC.FLD)
** SS 25: Results 503.485
? * AND SE/PN {All SE documents}
** SS 26: Results 408
? *1 AND DK/PN {All DK documents}
** SS 27: Results 853
? *2 AND NO/PN {All NO documents}
** SS 28: Results 714
? *3 AND FI/PN {All FI documents}
```


ASUS EX2019-p.139
Samsung v. ASUS
IPR2024-00614

```
** SS 29: Results 888
? *3 OR *2 OR *1 OR *
** SS 30: Results 2.863
? ..cr to wpiap
? ..FI WPIAP
? * AND (OR EP,WO,DE,GB,FR,AU,AT,US,CA)/PN
** SS 6: Results 10.568
? ..XT
? ..FI EPODOC
? *XT
** SS 31: Results 24.323
? (*1 NOT * ) NOT (OR US,EP,WO,DE,GB,FR,AU,AT,CA)/PR
** SS 32: Results 140
? * AND SE/PN {Filtered SE documents}
** SS 33: Results 47
? *1 AND DK/PN {Filtered DK documents}
** SS 34: Results 27
? *2 AND NO/PN {Filtered NO documents}
** SS 35: Results 15
? *3 AND FI/PN {Filtered FI documents}
** SS 36: Results 51
? LOGON
? ..FI PATENW
Input for Combi:
"WO2017052343"/PN
5 PN Documents found
4 NPL Documents found
including 2 restricted family members
Input for Combi:
"WO2017078319"/PN
4 PN Documents found
2 NPL Documents found
including 1 restricted family members
Input for Combi:
"WO2017052343"/PN
5 PN Documents found
4 NPL Documents found
including 2 restricted family members
Input for Combi:
"XP050992479"/PN
3 PN Documents found
0 NPL Documents found
including 1 restricted family members
Input for Combi:
"EP2498419"/PN
75 PN Documents found
3 NPL Documents found
including 7 restricted family members
Input for Combi:
"XP050992479"/PN
3 PN Documents found
0 NPL Documents found
including 1 restricted family members
Input for Combi:
or "WO2017052170"/PN, "WO2017052343"/PN, "WO2017078319"/PN, "XP050992479"/PN
13 PN Documents found
8 NPL Documents found
including 5 restricted family members
Input for Combi:
"US2017163388"/PN
```


ASUS EX2019-p.140
Samsung v. ASUS
IPR2024-00614

```
0 PN Documents found
0 NPL Documents found
including 2 restricted family members
Input for Combi:
"WO2017078237"/PN
5 PN Documents found
3 NPL Documents found
including 1 restricted family members
Input for Combi:
or "EP2887741"/PN, "US2012040620"/PN, "US2012257569"/PN, "WO2016190592"/PN,
"WO2017052182"/PN
630 PN Documents found
74 NPL Documents found
including 73 restricted family members
Input for Combi:
"WO2016190592"/PN
13 PN Documents found
5 NPL Documents found
including 3 restricted family members
Input for Combi:
or "US2011310833"/PN, "US2012230232"/PN, "XP050992479"/PN, "XP051024164"/PN,
"XP051082433"/PN
120 PN Documents found
6 NPL Documents found
including 15 restricted family members
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(uplink+_control+_information+ 9d uplink+_gran+) or (UCI 9d uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 9519
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (UCI+ 3d trans+) and MAC+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 4221
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
```

```
Mode Direct (Patent Search)
English query: '* and (configur+ 3d user+) and (skip+ 3d uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and (configur+ 3d user+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 1055
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and TTI+ and UCI+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 635
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and pusch+ and DTX+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 326
German query: ''
```

```
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and cqi+ and arq+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 224
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and enodeB+ and (transport+_block+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 57
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (skip+ 3d transport+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
```

```
English query: 'skip+_transport+_block+ and uplink+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 7
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'skip+_uplink+_transmi+ or skip+_ul_transmi+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 41
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and config+ and uplink+_control+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 14
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '11 and CQI+ and (ARQ+ or HARQ+) and transport+_block+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 6
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
```


ASUS EX2019-p.144
Samsung v. ASUS
IPR2024-00614

```
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '12 and 13'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 4
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'uci+ and (perio+ or aperio+) and (CQI+ or HARQ+_feedback+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 7329
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and skip+ and transport+_block+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 495
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and pad+ and (BSR or buffer+_status+)'
```

```
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 23
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(base+_stat+ or enodeB or enB+) and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 16019
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and uplink+_control+_info+ and (config+ 3d uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 2507
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (skip+ 3d trans+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 40
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
```

```
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query concept 1: '(rece+ 6d config+) and network+ and indi+ and skip+_uplink+ and
((uplink+ 3d data) or (without 3d uplink+))'
concept 2: 'determ+ and req+ and (uplink+_control+ or uci+) and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 6
German query concept 1: ''
concept 2: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query concept 1: ''
concept 2: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(rece+ 6d config+) and network+ and indi+ and skip+_uplink+ and ((uplink+
3d data) or (without 3d uplink+))'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 31
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and CQI+ and UCI+ and uplink+_gran+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
```

```
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'CQI+ and UCI+ and uplink+_gran+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 2138
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and pad+ and (buffer+_status+ or BSR+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 134
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and config+ and skip+ and uplink+_data+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 9
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '((pad+ 3d buffer+_status+_report+) or (pad+ 3d BSR+))'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
```

```
English results: 1391
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (skip+ 3d uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 10
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'skip+_ULTx+ and uplink+_control+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 2
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(UE or WTRU+) and skip+_UL_transmission+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 18
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
```


ASUS EX2019-p.149
Samsung v. ASUS
IPR2024-00614

```
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+ 3d UL_transmission+) and CQI+ and HARQ+ and UCI+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 3
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'L2_latency+_reduction+ and skip+ and uplink+ and transmi+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(latency+ 3d reduction+) and skip+ and uplink+ and transmi+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 116
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and semi+_persis+_schedul+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 30
```


ASUS EX2019-p.150
Samsung v. ASUS
IPR2024-00614

```
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(UCI+_trans+ 3d TTI+) and trans+_block+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 4
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'skip+_uplink+_transmission+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 25
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'uplink+_data+ 3d 'no_data''
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
```

```
Mode Direct (Patent Search)
English query: 'uplink+_data+ and 'no_data''
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'uplink+_data+ and UCI+_trans+ and data+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 1015
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and dtx+ and TTI+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 400
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and CQI+ and (skip+ 3d uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
```

German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '43 and (skip+ 3d uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '43 and (skip+ and uplink+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 38
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'skipulTX+ and uplink+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 3
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)

```
English query concept 1: '((rece+ 3d user+) or (rece+ 3d ue) or (rece+ 3d wtru+) or (rece+
3d term+)) and (rece+ 6d config+) and (( node+) or (enodeb+) or (enb+) or (base+_stat+))'
concept 2: '(config+ 9d skip+) and (skip 3d uplink+) and uplin+_data+'
concept 3: 'determ+ and ((req+ 3d uci+) or (req+ 3d uplink+_control+)) and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query concept 1: ''
concept 2: ''
concept 3: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query concept 1: ''
concept 2: ''
concept 3: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query concept 1: '(( node+) or (enodeb+) or (enb+) or (base+_stat+))'
concept 2: '(config+ 9d skip+) and (skip 3d uplink+) and uplin+_data+'
concept 3: 'determ+ and ((req+ 3d uci+) or (req+ 3d uplink+_control+)) and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query concept 1: ''
concept 2: ''
concept 3: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query concept 1: ''
concept 2: ''
concept 3: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query concept 1: '(config+ 9d skip+) and (skip 3d uplink+) and uplin+_data+'
concept 2: 'determ+ and ((req+ 3d uci+) or (req+ 3d uplink+_control+)) and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query concept 1: ''
concept 2: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
```

```
French query concept 1: ''
concept 2: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(config+ 9d skip+) and (skip 3d uplink+) and uplin+_data+ and uci+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 2
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+ 3d uplink+_transmi+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 48
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (uplink+_control+ or UCI+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 14
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
```

```
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 7
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: 'skip+_uplink+_transm+ and uplink+_contro+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 8
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+ 3d Trans+_Block+_trans+) and (UCI+ 3d trans+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(L2_laten+ 3d enhanc+) and SPS+ and padd+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'whether+_UCI+ and PUCCH+ and PUSCH+ and MAC+ and gener+ and transp+ and
block+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
```

```
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 92
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and padd+_BSR+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 12
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+_uplink+_trans+ 3d padd+) and BSR+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+_uplink+_trans+ 3d padd+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
```

```
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+_uplink+_trans+ and BSR+ and CQI+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(BSR+ and CQI+) and (period+ or aperiod+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 3208
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and trans+_block+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 1314
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (req+ 3d uplink+_control+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
```

```
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 122
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (skip+ or omit+) and uplink+_data+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 60
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and subfram+ and gra+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 45
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and uplink+_grant+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 35
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
```

French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (base+ or enb+ or enode+ or access+_poin+) and (UE or user+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 35
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '((send+ or trans+) 3d UCI+) and (UCI+ 3d PUCCH+) and transp+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 2544
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and pad+_BSR+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 22
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'SkipUplinkTx+ and transpor+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA TXPWOTEA WPIAP EPODOC'

```
English limit: None
English results: 2
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(Skip+ 3d Uplink+) and transpor+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 115
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and uplink+_gran+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 32
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and config+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 32
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
```

```
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(configu+ 3d user+) and skip+_uplink+_trans+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(configu+ 3d ue) and skip+_uplink+_trans+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 19
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and pusch+ and dtx+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 3
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: 'skip+_uplink+_trans+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
```

```
English results: 25
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(skip+_uplink+_trans+ 3d (data+ 3d transm+))'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '(skip+_uplink+_trans+ 3d (data+ 3d transm+))'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 85
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and (uplink+_gra+ or ul_gran+)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 60
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '(H04W24/02 /IC/EC/CN) or (H04W24/10 /IC/EC/CN) or (H04W72/04 /IC/EC/CN) or
(H04W72/12 /IC/EC/CN) or (H04W72/14 /IC/EC/CN) or (H04W88/02 /IC/EC/CN) or (H04W88/08
/IC/EC/CN) or (H04L1/18 /IC/EC/CN) or (H04L29/08 /IC/EC/CN) or (H04W74/00 /IC/EC/CN) or
(H04W52/02 /IC/EC/CN) or (H04L1/0026) or (H04L1/0031) or (H04L1/1671) or (H04L1/1812
/IC/EC/CN) or (H04L5/0098 /IC/EC/CN) or (H04W72/0413 /IC/EC/CN) or (H04W72/042 /IC/EC/CN)
or (H04W72/1205 /IC/EC/CN) or (H04W72/1268 /IC/EC/CN) or (H04W72/1284 /IC/EC/CN) or
(H04W72/1289 /IC/EC/CN) or (H04W76/048 /IC/EC/CN) or (H04W74/008 /IC/EC/CN) or
(H04W52/0209 /IC/EC/CN) or (H04L1/1829 /IC/EC/CN) or (H04L1/1861 /IC/EC/CN)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 12792
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '(H04W24/02 /IC/EC/CN) or (H04W24/10 /IC/EC/CN) or (H04W72/04 /IC/EC/CN) or
(H04W72/12 /IC/EC/CN) or (H04W72/14 /IC/EC/CN) or (H04W88/02 /IC/EC/CN) or (H04W88/08
/IC/EC/CN) or (H04L1/18 /IC/EC/CN) or (H04L29/08 /IC/EC/CN) or (H04W74/00 /IC/EC/CN) or
(H04W52/02 /IC/EC/CN) or (H04L1/0026) or (H04L1/0031) or (H04L1/1671) or (H04L1/1812
```


ASUS EX2019-p.163
Samsung v. ASUS
IPR2024-00614

```
/IC/EC/CN) or (H04L5/0098 /IC/EC/CN) or (H04W72/0413 /IC/EC/CN) or (H04W72/042 /IC/EC/CN)
or (H04W72/1205 /IC/EC/CN) or (H04W72/1268 /IC/EC/CN) or (H04W72/1284 /IC/EC/CN) or
(H04W72/1289 /IC/EC/CN) or (H04W76/048 /IC/EC/CN) or (H04W74/008 /IC/EC/CN) or
(H04W52/0209 /IC/EC/CN) or (H04L1/1829 /IC/EC/CN) or (H04L1/1861 /IC/EC/CN)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 1000310
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (skip+ 3d uplink+_trans+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 1
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and (uplink+_control+ or uci+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 6191
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and (uplink+_control+_information+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
```

```
English results: 1974
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (uplink+_grant+ or ul_grant+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 56
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and (uplink+ 6d trans+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 56
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and UCI+ and CQI+ and HARQ+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 23
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
```


ASUS EX2019-p.165
Samsung v. ASUS
IPR2024-00614

```
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and uplink+_grant+ and transport+_block+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 72
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and uplink+_data+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 11
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and (rece+ 3d uplink+_grant+)'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 457
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '* and periodic+ and HARQ+_feedback+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
```


ASUS EX2019-p.166
Samsung v. ASUS
IPR2024-00614

```
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '11 and HARQ+_feedback+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 16
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '2 and skip+ and uplink+_data+'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 1
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Patent Search:
Mode Direct (Patent Search)
English query: '3 and 14'
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA
TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPWOEA
TXPWOTEA WPIAP EPODOC'
English limit: None
English results: 0
German query: ''
German cluster: 'TXPEPGA TXPEPGB TXPGA TXPGB TXPGC TXPGT TXPGU TXPWOGA'
German limit: None
German results: 0
French query: ''
French cluster: 'TXPEPFA TXPEPFB TXPFA TXPFB TXPFC TXPFE TXPFF TXPFM TXPFT TXPWOFA'
French limit: None
French results: 0
? XFull Fulltext Non Patent Literature Search:
```


ASUS EX2019-p.167
Samsung v. ASUS
IPR2024-00614

```
Mode Direct (Non Patent Literature Search)
English query: 'skip+_uplink+_trans+ and uplink+_grant+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 91
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and uplink+_control+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 0
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '4 and control+ and HARQ+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 57
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and uplink+_data+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 20
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and req+ and user+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 19
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: 'uplink+_trans+ and uplink+_grant+ and transport+_block+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 4008
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and HARQ+_feedback+ and (uplink+_data+ 3d trans+)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 624
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and pad+ and buffer+ and UE'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 557
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and regardless+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC
XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
```


ASUS EX2019-p.168
Samsung v. ASUS
IPR2024-00614

English limit: None
English results: 556
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and (regardless+ 6d uplink+_data+)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 0
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '12 and (trans+ 3d transport+)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 483
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and (periodi+ or aperiod+) and CQI+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 474
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and HARQ+_feedback+'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 474
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and (rece+ 3d uplink+_grant+)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 61
? XFull Fulltext Non Patent Literature Search:
Mode Direct (Non Patent Literature Search)
English query: '* and req+ and (uplink+_data+ 3d trans+)'
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC NPL' ''
English limit: None
English results: 61
Internet search words: “reduce latency”, “no uplink data”

ASUS EX2019-p.169
Samsung v. ASUS
IPR2024-00614

Other Information:

ASUS EX2019-p.170
Samsung v. ASUS
IPR2024-00614

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 November 2017 (16.11.2017)

WIPO | PCT

(10) International Publication Number
WO 2017/194830 A1

(51) International Patent Classification:
H04W 72/12 (2009.01) *H04W 24/02* (2009.01)
H04W 72/04 (2009.01)

(21) International Application Number:
PCT/FI2017/050343

(22) International Filing Date:
04 May 2017 (04.05.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/335,280 12 May 2016 (12.05.2016) US

(71) Applicant: **NOKIA TECHNOLOGIES OY** [FI/FI]; Karaportti 3, 02610 Espoo (FI).

(72) Inventor: **WU, Chunli**; 12-5-301, Huihuayuan, Huilongguan, Changping District, Beijing, 102208 (CN).

(74) Agent: **NOKIA TECHNOLOGIES OY** et al.; Ari Aarnio, IPR Department, Karakaari 7, 02610 Espoo (FI).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,

(54) Title: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

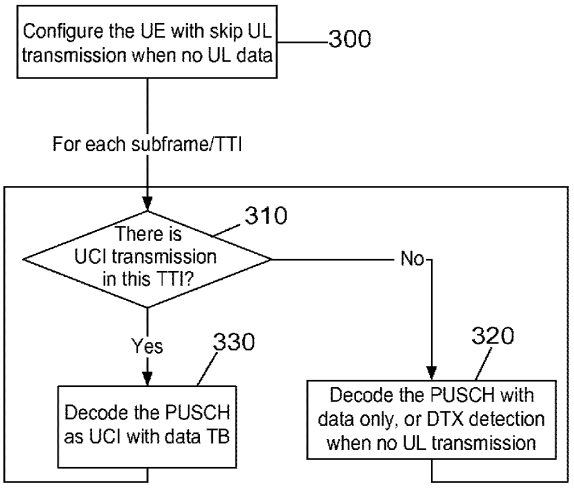


Fig. 3a

(57) Abstract: Systems, methods, apparatuses, and computer program products for skipping TB transmission depending on UCI transmission are provided. One method includes receiving, by a UE, a configuration message from a network node. The configuration message may indicate to the UE a configuration of skipping uplink (UL) transmission when there is no uplink data. The method may then include determining whether the UE is requested for uplink control information (UCI) transmission for a subframe with UL grant. If it is determined that the UE is requested for UCI transmission, then the method may include generating and transmitting a transport block containing padding buffer status report (BSR).

[Continued on next page]

WO 2017/194830 A1

MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

CROSS-REFERENCE TO RELATED APPLICATIONS:

[0001] This application claims priority from United States Provisional Application No. 62/335,280, filed on May 12, 2016. The entire contents of this earlier filed application are hereby incorporated by reference in their entirety.

BACKGROUND:

Field:

[0002] Embodiments of the invention generally relate to wireless or mobile communications networks, such as, but not limited to, the Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN), Long Term Evolution (LTE) Evolved UTRAN (E-UTRAN), LTE-Advanced (LTE-A), LTE-Advanced Pro, LTE-M, and/or 5G radio access technology. Some embodiments may relate to methods and apparatuses for possibly skipping transport block (TB) transmission depending on uplink control information (UCI) transmission.

Description of the Related Art:

[0003] Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN) refers to a communications network including base stations or Node Bs, and, for example, radio network controllers (RNC). UTRAN allows for connectivity between the user equipment (UE) and the core network. The RNC provides control functionalities for one or more Node Bs. The RNC and its corresponding Node Bs are called the Radio Network Subsystem (RNS). In case of E-UTRAN (enhanced UTRAN), no RNC exists and radio access functionality is provided by an evolved Node B (eNodeB or eNB) or many eNBs. Multiple eNBs are involved for a single UE connection, for example, in case of Coordinated Multipoint Transmission (CoMP) and in dual connectivity.

[0004] Long Term Evolution (LTE) or E-UTRAN provides a new radio access technology and refers to the improvements of UMTS through improved efficiency and services, lower costs, and use of new spectrum opportunities. In particular, LTE is a 3GPP standard that provides for uplink peak rates of at least, for example, 75 megabits per second (Mbps) per carrier and downlink peak rates of at least, for example, 300 Mbps per carrier. LTE supports scalable carrier bandwidths from 20 MHz down to 1.4 MHz and supports both Frequency Division Duplexing (FDD) and Time Division Duplexing (TDD).

[0005] As mentioned above, LTE may also improve spectral efficiency in networks, allowing carriers to provide more data and voice services over a given bandwidth. Therefore, LTE is designed to fulfill the needs for high-speed data and media transport in addition to high-capacity voice support. Advantages of LTE include, for example, high throughput, low latency, FDD and TDD support in the same platform, an improved end-user experience, and a simple architecture resulting in low operating costs.

[0006] Certain releases of 3GPP LTE (e.g., LTE Rel-10, LTE Rel-11, LTE Rel-12, LTE Rel-13) are targeted towards international mobile telecommunications advanced (IMT-A) systems, referred to herein for convenience simply as LTE-Advanced (LTE-A).

[0007] LTE-A is directed toward extending and optimizing the 3GPP LTE radio access technologies. A goal of LTE-A is to provide significantly enhanced services by means of higher data rates and lower latency with reduced cost. LTE-A is a more optimized radio system fulfilling the international telecommunication union-radio (ITU-R) requirements for IMT-Advanced while keeping the backward compatibility.

[0008] 5th generation wireless systems (5G) refers to the new generation of radio systems and network architecture. 5G is expected to provide higher bitrates and coverage as well as decreased latency than the current LTE systems. Some estimate that 5G will provide bitrates one hundred times higher than LTE offers. 5G is also expected to increase network expandability up to hundreds of thousands of connections. The signal technology of 5G is anticipated to be improved for greater coverage and further reduced latency as well as spectral and signaling efficiency.

SUMMARY:

[0009] One embodiment is directed to a method that may include receiving, by a user equipment, a configuration message from a network node. The configuration message may indicate to the user equipment a configuration of skipping uplink transmission when there is no uplink data. The method may then include determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant. In certain embodiments, if it is determined that the UE is requested for UCI transmission, then the method may include generating and transmitting a transport block regardless of whether there is uplink data to be transmitted.

[0010] Another embodiment is directed to an apparatus that may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to receive a configuration message from a network node. The configuration message may indicate to the apparatus a configuration of skipping uplink transmission when there is no uplink data. The at least one memory and the computer program code may be further configured, with the at least one processor, to cause the apparatus at least to determine whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant. In certain embodiments, if it is determined that the UE is configured for UCI transmission, then the at least one memory and the computer program code may be further configured, with the at least one processor, to cause the apparatus at least to generate and transmit a transport block regardless of whether there is uplink data to be transmitted.

[0011] Another embodiment is directed to an apparatus including receiving means for receiving a configuration message from a network node. The configuration message may indicate to the apparatus a configuration of skipping uplink transmission when there is no uplink data. The apparatus may also include determining means for determining whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant. In certain

embodiments, if it is determined that the UE is configured for UCI transmission, then the apparatus may include means for generating and transmitting a transport block regardless of whether there is uplink data to be transmitted.

[0012] Another embodiment is directed to a method that may include transmitting, by a network node, a configuration message for configuring at least one UE to skip uplink transmission when there is no uplink data. The method may then include receiving, from the at least one UE, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one UE.

[0013] Another embodiment is directed to an apparatus that may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to transmit a configuration message for configuring at least one UE to skip uplink transmission when there is no uplink data. The at least one memory and the computer program code may be further configured, with the at least one processor, to cause the apparatus at least to receive, from the at least one UE, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one UE.

[0014] Another embodiment is directed to an apparatus that may include transmitting means for transmitting a configuration message for configuring at least one UE to skip uplink transmission when there is no uplink data. The apparatus may also include receiving means for receiving, from the at least one UE, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one UE.

BRIEF DESCRIPTION OF THE DRAWINGS:

[0015] For proper understanding of the invention, reference should be made to the accompanying drawings, wherein:

[0016] Fig. 1 illustrates a block diagram depicting Transport block processing for UL-SCH;

[0017] Fig. 2a illustrates a block diagram of an apparatus, according to an embodiment;

[0018] Fig. 2b illustrates a block diagram of an apparatus, according to another embodiment;

[0019] Fig. 3a illustrates a flow chart of a method, according to one embodiment; and

[0020] Fig. 3b illustrates a flow chart of a method, according to another embodiment.

DETAILED DESCRIPTION:

[0021] It will be readily understood that the components of the invention, as generally described and illustrated in the figures herein, may be arranged and designed in a wide variety of different configurations. Thus, the following detailed description of embodiments of systems, methods, apparatuses, and computer program products for skipping TB transmission depending on UCI transmission, as represented in the attached figures, is not intended to limit the scope of the invention, but is merely representative of some selected embodiments of the invention.

[0022] The features, structures, or characteristics of the invention described throughout this specification may be combined in any suitable manner in one or more embodiments. For example, the usage of the phrases "certain embodiments," "some embodiments," or other similar language, throughout this specification refers to the fact that a particular feature, structure, or characteristic described in connection with the embodiment may be included in at least one embodiment of the present invention. Thus, appearances of the phrases "in certain embodiments," "in some embodiments," "in other embodiments," or other similar language, throughout this specification do not necessarily all refer to the same group of embodiments, and the described features, structures, or characteristics may be combined in any suitable manner in one or more embodiments.

[0023] Additionally, if desired, the different functions discussed below may be performed in a different order and/or concurrently with each other. Furthermore, if desired, one or more of the described functions may be optional or may be combined.

As such, the following description should be considered as merely illustrative of the principles, teachings and embodiments of this invention, and not in limitation thereof.

[0024] Certain embodiments relate to L2 latency reduction techniques for LTE. A Rel-14 work item (WI) on latency reduction was agreed in RAN #71 with the objective to specify L2 latency enhancements as identified in RAN2, which may include the introduction of short semi-persistent scheduling (SPS) period to allow uplink (UL) prescheduling, the reduction of padding in case of dynamic and SPS based UL pre-scheduling to reduce interference and UE power consumption, and further discussion on the introduction of feedback for SPS activation, reactivation and deactivation command.

[0025] According to an embodiment, the UE can be configured to skip UL transmission which only contains padding buffer status report (BSR) when there is no UL data in the buffer to be transmitted.

[0026] Currently, when there is Physical Uplink Shared Channel (PUSCH) allocation, UCI will be sent on PUSCH, multiplexed and interleaved with data according to 3GPP technical specifications (TS) 36.213 and 36.212. In 3GPP TS 36.213 section 7.2, it is specified that: "if a UE is not configured for simultaneous PUSCH and physical uplink control channel (PUCCH) transmission, it shall transmit periodic CSI reporting on PUCCH as defined hereafter in subframes with no PUSCH allocation…If a UE is not configured for simultaneous PUSCH and PUCCH transmission, it shall transmit periodic CSI reporting on PUSCH of the serving cell with smallest *ServCellIndex* as defined hereafter in subframes with a PUSCH allocation, where the UE shall use the same PUCCH-based periodic CSI reporting format on PUSCH."

[0027] In 3GPP TS 36.212, section 5.2.2 deals with the uplink shared channel (UL-SCH) and transport block (TB) processing for the UL-SCH. Fig. 1 illustrates a block diagram depicting Transport block processing for UL-SCH, as provided in Fig. 5.2.2-1 of 3GPP TS 36.212.

[0028] However, it is not clear how UCI is handled if there is no TB generated from the medium access control (MAC) layer. Therefore, currently, there is no

resolution or approach for whether UCI should be sent on PUCCH or PUSCH when MAC does not generate a TB when it does not have UL data in the buffer.

[0029] In view of the above, an embodiment of the invention includes that, if skipping uplink transmission with only padding BSR is configured, for the subframe with UL grant and there is UCI transmission, MAC should generate the TB. In other words, the TB with padding BSR only is not skipped if the subframe is configured with periodic channel quality indicator (CQI), or aperiodic CQI requested for that subframe, or hybrid automatic repeat request (HARQ) feedback is to be sent on that subframe.

[0030] Alternatively, in another embodiment, if there is an UL grant and MAC does not generate TB because it does not have UL data to be transmitted, UCI is sent on PUSCH as if the grant is an UCI only grant following the description in 3GPP 36.212 section 5.2.4, even though the grant is intended for data with UCI.

[0031] According to yet another embodiment, if there is an UL grant and MAC does not generate TB because it does not have UL data to be transmitted, UCI is sent on PUCCH even if the UE has PUSCH allocation.

[0032] In one example embodiment, when the UE is configured with skipping UL transmission with only padding BSR and when no UL data: for the subframe with UL grant and UCI transmission (when there is periodic CQI configured in that subframe, or aperiodic CQI required for the subframe, or HARQ feedback is to be transmitted in that subframe), MAC always generates the TB even if it only contains padding BSR indicating Buffer status equals to 0. With this, there would be no impact to physical layer (PHY).

[0033] According to an embodiment, if MAC does not provide the TB when there is UCI transmission, PHY may need to generate some dummy data then mute them and send UCI only on the allocated PUSCH resource. Alternatively, the UL grant may be used to send UCI only following the description in 3GPP TS 36.212 section 5.2.4. This may require double decoding at the eNB side for UCI only and UCI with data on PUSCH, as well as some changes in PHY is expected to allow UL grant for data to be used for UCI only, as currently CQI only grant has specific format.

[0034] Another embodiment may include sending UCI on PUCCH when MAC does not generate any TB. This may require double decoding at the eNB though for UCI on PUCCH or UCI with data on PUSCH depending on whether there is UL data to be transmitted. Double decoding is likely already supported by eNB implementation to handle the case of PDCCH for UL grant lost. Some modifications to the 3GPP specification (e.g. 36.213) may be needed so that CQI on PUSCH or PUCCH should not be based on PUSCH allocation, but to allow it to be sent on PUCCH when MAC does not generate a TB.

[0035] Fig. 2a illustrates an example of an apparatus 10 according to an embodiment. In an embodiment, apparatus 10 may be a node, host, or server in a communications network or serving such a network. For example, apparatus 10 may be a network node or access node for a radio access network, such as a base station, node B or eNB, or an access node of 5G radio access technology. It should be noted that one of ordinary skill in the art would understand that apparatus 10 may include components or features not shown in Fig. 2a.

[0036] As illustrated in Fig. 2a, apparatus 10 may include a processor 22 for processing information and executing instructions or operations. Processor 22 may be any type of general or specific purpose processor. While a single processor 22 is shown in Fig. 2a, multiple processors may be utilized according to other embodiments. In fact, processor 22 may include one or more of general-purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), and processors based on a multi-core processor architecture, as examples.

[0037] Processor 22 may perform functions associated with the operation of apparatus 10 which may include, for example, precoding of antenna gain/phase parameters, encoding and decoding of individual bits forming a communication message, formatting of information, and overall control of the apparatus 10, including processes related to management of communication resources.

[0038] Apparatus 10 may further include or be coupled to a memory 14 (internal or external), which may be coupled to processor 22, for storing information and

instructions that may be executed by processor 22. Memory 14 may be one or more memories and of any type suitable to the local application environment, and may be implemented using any suitable volatile or nonvolatile data storage technology such as a semiconductor-based memory device, a magnetic memory device and system, an optical memory device and system, fixed memory, and removable memory. For example, memory 14 can be comprised of any combination of random access memory (RAM), read only memory (ROM), static storage such as a magnetic or optical disk, or any other type of non-transitory machine or computer readable media. The instructions stored in memory 14 may include program instructions or computer program code that, when executed by processor 22, enable the apparatus 10 to perform tasks as described herein.

[0039] In some embodiments, apparatus 10 may also include or be coupled to one or more antennas 25 for transmitting and receiving signals and/or data to and from apparatus 10. Apparatus 10 may further include or be coupled to a transceiver 28 configured to transmit and receive information. For instance, transceiver 28 may be configured to modulate information on to a carrier waveform for transmission by the antenna(s) 25 and demodulate information received via the antenna(s) 25 for further processing by other elements of apparatus 10. In other embodiments, transceiver 28 may be capable of transmitting and receiving signals or data directly.

[0040] In an embodiment, memory 14 may store software modules that provide functionality when executed by processor 22. The modules may include, for example, an operating system that provides operating system functionality for apparatus 10. The memory may also store one or more functional modules, such as an application or program, to provide additional functionality for apparatus 10. The components of apparatus 10 may be implemented in hardware, or as any suitable combination of hardware and software.

[0041] In one embodiment, apparatus 10 may be a network node or access node, such as a base station, node B, or eNB, or an access node of 5G, for example. According to one embodiment, apparatus 10 may be controlled by memory 14 and processor 22 to perform the functions associated with embodiments described herein. For instance, in one embodiment, apparatus 10 may be controlled by memory 14 and

processor 22 to configure one or more UEs to skip UL transmission when there is no UL data. For example, the configuring of the UE(s) may include apparatus 10 being controlled to transmit a configuration message indicating to the UE(s) to skip UL transmission when there is no UL data.

[0042] For each subframe/transmission time interval (TTI), apparatus 10 may be controlled by memory 14 and processor 22 to determine if there is UCI transmission in that TTI. If there is no UCI transmission in that TTI, apparatus 10 may be controlled by memory 14 and processor 22 to decode the PUSCH with data only or DTX detection when there is no UL transmission. If there is UCI transmission in that TTI, apparatus 10 may be controlled by memory 14 and processor 22 to decode the PUSCH as UCI with data TB.

[0043] Fig. 2b illustrates an example of an apparatus 20 according to another embodiment. In an embodiment, apparatus 20 may be a node or element in a communications network or associated with such a network, such as a UE, mobile device, mobile unit, or other device. For instance, in some embodiments, apparatus 20 may be UE in LTE, LTE-A, or 5G. It should be noted that one of ordinary skill in the art would understand that apparatus 20 may include components or features not shown in Fig. 2b.

[0044] As illustrated in Fig. 2b, apparatus 20 may include a processor 32 for processing information and executing instructions or operations. Processor 32 may be any type of general or specific purpose processor. While a single processor 32 is shown in Fig. 2b, multiple processors may be utilized according to other embodiments. In fact, processor 32 may include one or more of general-purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs), field-programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), and processors based on a multi-core processor architecture, as examples.

[0045] Processor 32 may perform functions associated with the operation of apparatus 20 including, without limitation, precoding of antenna gain/phase parameters, encoding and decoding of individual bits forming a communication

message, formatting of information, and overall control of the apparatus 20, including processes related to management of communication resources.

[0046] Apparatus 20 may further include or be coupled to a memory 34 (internal or external), which may be coupled to processor 32, for storing information and instructions that may be executed by processor 32. Memory 34 may be one or more memories and of any type suitable to the local application environment, and may be implemented using any suitable volatile or nonvolatile data storage technology such as a semiconductor-based memory device, a magnetic memory device and system, an optical memory device and system, fixed memory, and removable memory. For example, memory 34 can be comprised of any combination of random access memory (RAM), read only memory (ROM), static storage such as a magnetic or optical disk, or any other type of non-transitory machine or computer readable media. The instructions stored in memory 34 may include program instructions or computer program code that, when executed by processor 32, enable the apparatus 20 to perform tasks as described herein.

[0047] In some embodiments, apparatus 20 may also include or be coupled to one or more antennas 35 for transmitting and receiving signals and/or data to and from apparatus 20. Apparatus 20 may further include a transceiver 38 configured to transmit and receive information. For instance, transceiver 38 may be configured to modulate information on to a carrier waveform for transmission by the antenna(s) 35 and demodulate information received via the antenna(s) 35 for further processing by other elements of apparatus 20. In other embodiments, transceiver 38 may be capable of transmitting and receiving signals or data directly.

[0048] In an embodiment, memory 34 stores software modules that provide functionality when executed by processor 32. The modules may include, for example, an operating system that provides operating system functionality for apparatus 20. The memory may also store one or more functional modules, such as an application or program, to provide additional functionality for apparatus 20. The components of apparatus 20 may be implemented in hardware, or as any suitable combination of hardware and software.

[0049] As mentioned above, according to one embodiment, apparatus 20 may be a mobile device, such as a UE. In this embodiment, apparatus 20 may be controlled by memory 34 and processor 32 to perform the functions associated with embodiments described herein. In one embodiment, apparatus 20 may be configured to skip UL transmission when there is no UL data. For example, according to an embodiment, apparatus 20 may be controlled by memory 34 and processor 32 to receive a configuration message, from a base station or eNB, to configure apparatus 20 to skip UL transmission when there is no UL data.

[0050] For each subframe/TTI, apparatus 20 may be controlled by memory 34 and processor 32 to check if there is UL data or MAC control element (CE) to be sent. If there is UL data or MAC CE to be sent, MAC generates the TB and it is delivered to PHY regardless of whether there is UL data to be transmitted. If there is no UL data or MAC CE to be sent, apparatus 20 may be controlled by memory 34 and processor 32 to check if there is UCI transmission in this TTI. If there is no UCI transmission in this TTI, generation of the TB is skipped and no TB is delivered to the PHY if there is no UL data to be transmitted. If there is UCI transmission in this TTI, MAC generates the TB and it is delivered to PHY.

[0051] Fig. 3a illustrates an example of a flow chart for a method, according to one embodiment. In certain embodiments, the method depicted in Fig. 3a may be performed by a base station or eNB, for example. As illustrated in Fig. 3a, the method may include, at 300, configuring one or more UEs to skip UL transmission when there is no UL data. For example, the configuring of the UE(s) may include transmitting a configuration message indicating to the UE(s) to skip UL transmission when there is no UL data. For each subframe/TTI, the method may include, at 310, determining or checking whether there is UCI transmission in that TTI. If there is no UCI transmission in that TTI, then the method may include, at 320, decoding the PUSCH with data only or DTX detection when there is no UL transmission. If there is UCI transmission in that TTI, then the method may include, at 330, decoding the PUSCH as UCI with data TB.

[0052] Fig. 3b illustrates an example of a flow chart for a method, according to another embodiment. In certain embodiments, the method depicted in Fig. 3b may be

performed by a mobile device or UE, for example. As illustrated in Fig. 3b, the method may include, at 350, receiving a configuration message, for example from a base station or eNB, indicating to skip UL transmission when there is no UL data. For each subframe/TTI, the method may include, at 360, checking or determining whether there is UL data or MAC control element (CE) to be sent. If there is UL data or MAC CE to be sent, the method may include, at 380, generating the TB and delivering it to PHY regardless of whether there is UL data to be transmitted. If there is no UL data or MAC CE to be sent, the method may further include, at 365, checking or determining whether there is UCI transmission in this TTI. If there is no UCI transmission in this TTI, the method may include, at 370, skipping generation of the TB and not delivering any TB to the PHY if there is no UL data to be transmitted. If there is UCI transmission in this TTI, the method may include, at 380, generating the TB and delivering it to PHY.

[0053] Embodiments of the invention provide several advantages and/or technical improvements. For example, the use of embodiments of the invention can result in latency reduction and power savings, thereby improving the functioning of communications networks and their nodes.

[0054] In some embodiments, the functionality of any of the methods, processes, or flow charts described herein may be implemented by software and/or computer program code or portions of it stored in memory or other computer readable or tangible media, and executed by a processor. In some embodiments, the apparatus may be, included or be associated with at least one software application, module, unit or entity configured as arithmetic operation(s), or as a program or portions of it (including an added or updated software routine), executed by at least one operation processor. Programs, also called program products or computer programs, including software routines, applets and macros, may be stored in any apparatus-readable data storage medium and they include program instructions to perform particular tasks. A computer program product may comprise one or more computer-executable components which, when the program is run, are configured to carry out embodiments. The one or more computer-executable components may be at least one software code or portions of it. Modifications and configurations required for

implementing functionality of an embodiment may be performed as routine(s), which may be implemented as added or updated software routine(s). Software routine(s) may be downloaded into the apparatus.

[0055] Software or a computer program code or portions of it may be in a source code form, object code form, or in some intermediate form, and it may be stored in some sort of carrier, distribution medium, or computer readable medium, which may be any entity or device capable of carrying the program. Such carriers include a record medium, computer memory, read-only memory, photoelectrical and/or electrical carrier signal, telecommunications signal, and software distribution package, for example. Depending on the processing power needed, the computer program may be executed in a single electronic digital computer or it may be distributed amongst a number of computers. The computer readable medium or computer readable storage medium may be a non-transitory medium.

[0056] In other embodiments, the functionality may be performed by hardware, for example through the use of an application specific integrated circuit (ASIC), a programmable gate array (PGA), a field programmable gate array (FPGA), or any other combination of hardware and software. In yet another embodiment, the functionality may be implemented as a signal, a non-tangible means that can be carried by an electromagnetic signal downloaded from the Internet or other network.

[0057] According to an embodiment, an apparatus, such as a node, device, or a corresponding component, may be configured as a computer or a microprocessor, such as single-chip computer element, or as a chipset, including at least a memory for providing storage capacity used for arithmetic operation and an operation processor for executing the arithmetic operation.

[0058] One embodiment is directed to a method, which may be performed by a UE. The method may include receiving, by the UE, a configuration message from a base station or eNB. The configuration message may indicate to the UE a configuration of skipping UL transmission when there is no UL data. In response to receiving of the configuration message, the method may also include receiving (downlink) data/signal from the BS/eNB, and determining that the UE is configured/requested for periodic/aperiodic CQI or HARQ for a subframe with UL grant, regarding the

received data/signal. Based on the determining, the method may also include generating a TB regardless of whether there is UL data to be transmitted and, consequently, not skipping padding BSR only protocol data unit (PDU). The method may also include transmitting the TB to the BS regardless of whether there is UL data to be transmitted.

[0059] Another embodiment is directed to an apparatus, which may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to receive a configuration message from a base station or eNB. The configuration message may indicate to the apparatus a configuration of skipping UL transmission when there is no UL data. In response to receiving of the configuration message, the at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to receive (downlink) data/signal from the BS/eNB, and determine that the apparatus is configured/requested for periodic/aperiodic CQI or HARQ for a subframe with UL grant, regarding the received data/signal. Based on the determining, The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to generate a TB regardless of the whether there is UL data to be transmitted and, consequently, not skipping padding BSR only PDU. The at least one memory and the computer program code may be further configured, with the at least one processor, to cause the apparatus at least to transmit the TB to the BS regardless of whether there is UL data to be transmitted .

[0060] Another embodiment is directed to a method, which may be performed by a base station or eNB. The method may include transmitting a configuration message for configuring at least one UE to skip UL transmission when there is no UL data. The method may further include transmitting a data/signal to the at least one UE. The method may then include receiving a TB for the subframe with UCI transmission regardless of the skipping UL transmission configuration.

[0061] Another embodiment is directed to an apparatus, which may include at least one processor and at least one memory including computer program code. The at least

one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to transmit a configuration message for configuring at least one UE to skip UL transmission when there is no UL data. The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to transmit a data/signal to the at least one UE, and to receive a TB for the subframe with UCI transmission regardless of the skipping UL transmission configuration.

[0062] One having ordinary skill in the art will readily understand that the invention as discussed above may be practiced with steps in a different order, and/or with hardware elements in configurations which are different than those which are disclosed. Therefore, although the invention has been described based upon these preferred embodiments, it would be apparent to those of skill in the art that certain modifications, variations, and alternative constructions would be apparent, while remaining within the spirit and scope of the invention. In order to determine the metes and bounds of the invention, therefore, reference should be made to the appended claims.

We Claim:

1. A method, comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission when there is no uplink data; and

determining whether the user equipment is requested for uplink control information transmission for a subframe with uplink grant.

2. The method according to claim 1, wherein, when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with uplink grant, generating a transport block regardless of whether there is uplink data to be transmitted.

3. The method according to claim 1 or 2, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, skipping generating a transport block.

4. The method according to any one of claims 1-3, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator (CQI) or hybrid automatic repeat request feedback (HARQ feedback).

5. The method according to any one of claims 1-4, further comprising transmitting a transport block to the network node regardless of whether there is uplink data to be transmitted.

6. The method according to any one of claims 1-5, further comprising receiving the uplink grant from the network node.

7. The method according to any one of claims 1-6, wherein the network node comprises

a base station or evolved node B.

8. An apparatus, comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission when there is no uplink data; and

determine whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant.

9. The apparatus according to claim 8, wherein, when it is determined that the apparatus is requested for the uplink control information transmission for the subframe with uplink grant, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted.

10. The apparatus according to claim 8 or 9, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

11. The apparatus according to any one of claims 8-10, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator (CQI) or hybrid automatic repeat request feedback (HARQ feedback).

12. The apparatus according to any one of claims 8-11, wherein the at least one

memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted.

13. The apparatus according to any one of claims 8-12, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

14. The apparatus according to any one of claims 8-13, wherein the network node comprises a base station or evolved node B.

15. The apparatus according to any one of claims 8-13, wherein the apparatus comprises a user equipment.

16. An apparatus, comprising:

receiving means for receiving a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission when there is no uplink data; and

determining means for determining whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant.

17. An apparatus according to claim 16, further comprising means for performing the method according to any of claims 2-7.

18. A method, comprising:

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and

receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

19. The method according to claim 18, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator (CQI) or hybrid automatic repeat request feedback (HARQ feedback).

20. The method according to claims 18 or 19, further comprising transmitting uplink grant to the at least one user equipment.

21. The method according to any one of claims 18-20, wherein the network node comprises a base station or evolved node B.

22. An apparatus, comprising:

at least one processor; and

at least one memory including computer program code;

the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to

transmit a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and

receive, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

23. The apparatus according to claim 22, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator (CQI) or hybrid automatic repeat request feedback (HARQ feedback).

24. The apparatus according to claims 22 or 23, wherein the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to transmit uplink grant to the at least one user equipment.

25. The apparatus according to any one of claims 22-24, wherein the apparatus

comprises a base station or evolved node B.

26. An apparatus, comprising:

transmitting means for transmitting a configuration message for configuring at least one user equipment to skip uplink transmission when there is no uplink data; and

receiving means for receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

27. An apparatus according to claim 26, further comprising means for performing the method according to claim 19 or 20.

28. A computer program, embodied on a non-transitory computer readable medium, wherein the computer program is configured to control a processor to perform a method according to any one of claims 1-7 or 18-21.

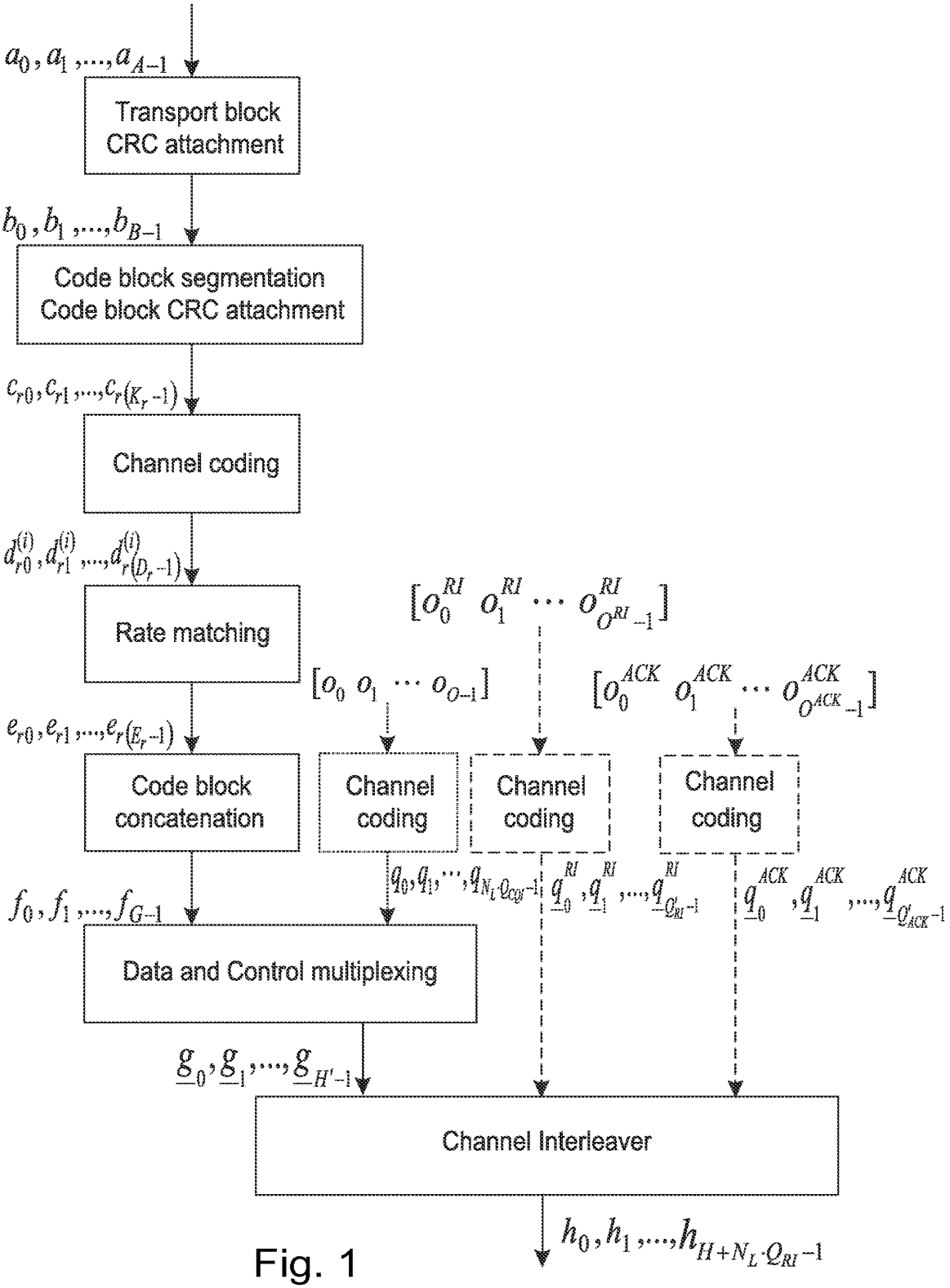

$a_0, a_1, \ldots, a_{A-1}$
Transport block CRC attachment
$b_0, b_1, \ldots, b_{B-1}$
Code block segmentation Code block CRC attachment
$c_{r0}, c_{r1}, \ldots, c_{r(K_r-1)}$
Channel coding
$d_{r0}^{(i)}, d_{r1}^{(i)}, \ldots, d_{r(D_r-1)}^{(i)}$
Rate matching
$e_{r0}, e_{r1}, \ldots, e_{r(E_r-1)}$
Code block concatenation
$f_0, f_1, \ldots, f_{G-1}$
$[o_0^{RI} \; o_1^{RI} \cdots o_{O^{RI}-1}^{RI}]$
$[o_0 \; o_1 \cdots o_{O-1}]$
$[o_0^{ACK} \; o_1^{ACK} \cdots o_{O^{ACK}-1}^{ACK}]$
Channel coding
Channel coding
Channel coding
$q_0, q_1, \ldots, q_{N_L \cdot Q_{CQI}-1}$
$\underline{q}_0^{RI}, \underline{q}_1^{RI}, \ldots, \underline{q}_{Q_{RI}-1}^{RI}$
$\underline{q}_0^{ACK}, \underline{q}_1^{ACK}, \ldots, \underline{q}_{Q'_{ACK}-1}^{ACK}$
Data and Control multiplexing
$\underline{g}_0, \underline{g}_1, \ldots, \underline{g}_{H'-1}$
Channel Interleaver
$h_0, h_1, \ldots, h_{H+N_L \cdot Q_{RI}-1}$

Fig. 1

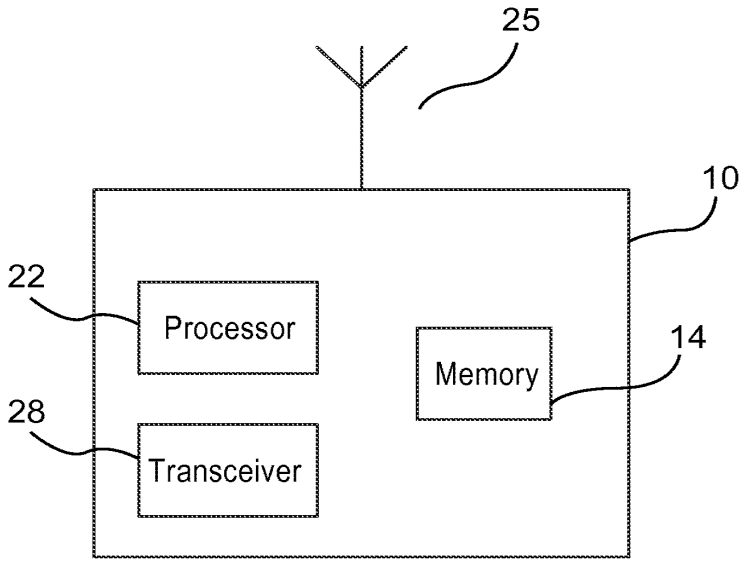

25
10
22
Processor
14
Memory
28
Transceiver

Fig. 2a

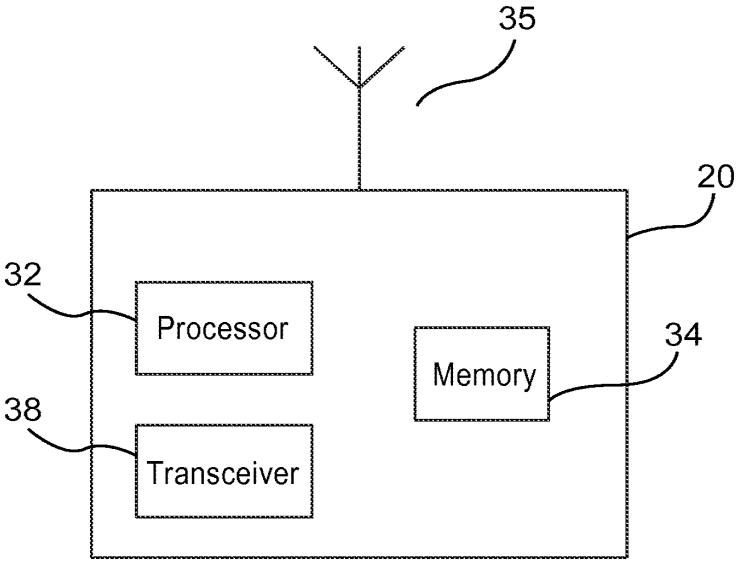

35
20
32
Processor
34
Memory
38
Transceiver

Fig. 2b

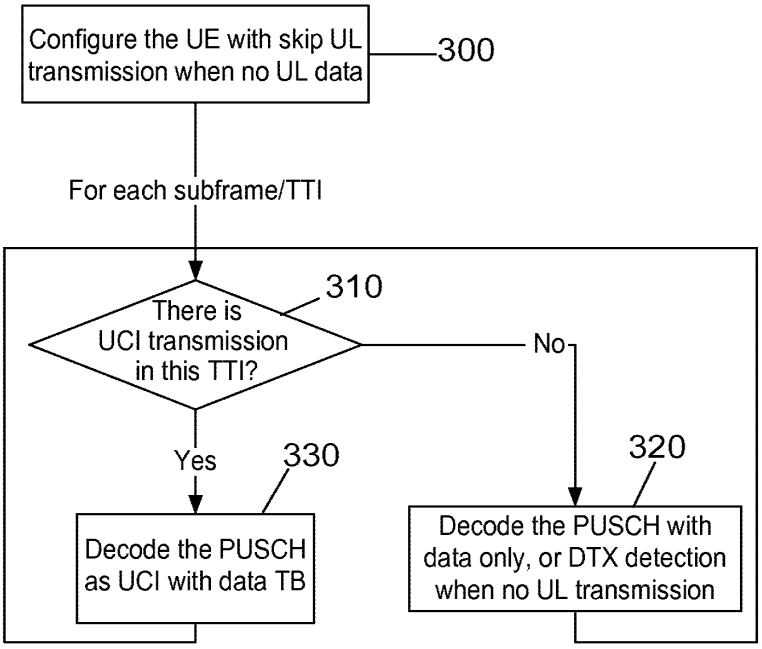

Configure the UE with skip UL transmission when no UL data
300
For each subframe/TTI
310
There is UCI transmission in this TTI?
No
Yes
330
320
Decode the PUSCH as UCI with data TB
Decode the PUSCH with data only, or DTX detection when no UL transmission

Fig. 3a

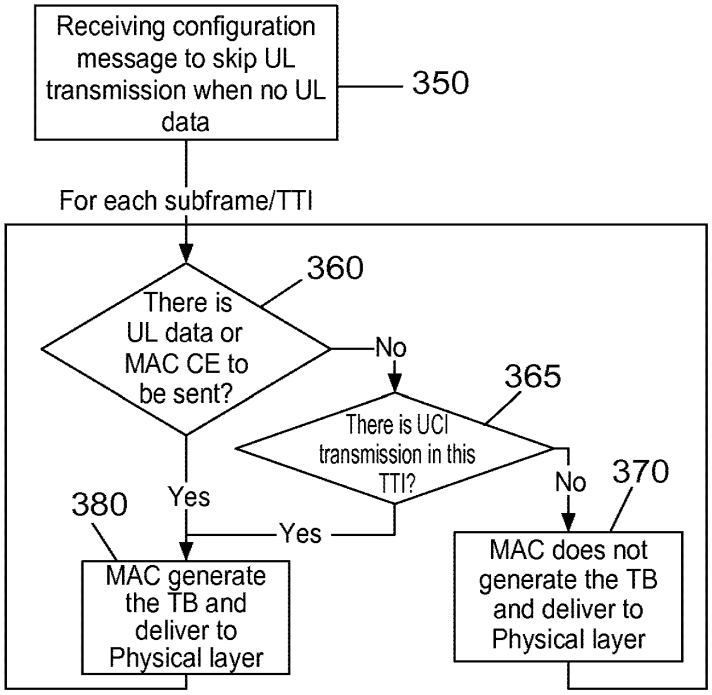

Receiving configuration message to skip UL transmission when no UL data
350
For each subframe/TTI
360
There is UL data or MAC CE to be sent?
No
365
There is UCI transmission in this TTI?
No
370
Yes
380
Yes
MAC generate the TB and deliver to Physical layer
MAC does not generate the TB and deliver to Physical layer

Fig. 3b

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	16099421
	Filing Date	2018-11-06
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

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					

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					

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							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

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.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16099421
	Filing Date	2018-11-06
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

	1	Office action received for corresponding Vietnam Patent Application No. 1-2018-05301, dated January 08, 2019, 1 pages of office action and 1 pages of office action translation available.	X

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	16099421
	Filing Date	2018-11-06
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

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	/Nico van Waes/	Date (YYYY-MM-DD)	2018-02-10
Name/Print	Nico van Waes	Registration Number	61828

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.

Electronic Acknowledgement Receipt

EFS ID:	35106964
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	73658
Filer:	Nico Johannes van Waes/Sandy Fong
Filer Authorized By:	Nico Johannes van Waes
Attorney Docket Number:	NC101437-US-PCT
Receipt Date:	10-FEB-2019
Filing Date:	
Time Stamp:	18:30:40
Application Type:	U.S. National Stage under 35 USC 371

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)	NC101437_IDS.pdf	612059 e3eec3b838265bf92c11a0212e0699ef432f3430	no	4

Warnings:

Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Other Reference-Patent/App/Search documents	NPL_1_VN1201805301_01_08_2019_.pdf	1046330 eb7a7f4d818bad6ec82759dafc17e1523d4e3489	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1658389	

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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/099,421

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	520
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))	20 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1				x 460 =	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).						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	2040

APPLICATION AS AMENDED - PART II

AMENDMENT A

	(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($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
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	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
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.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
16099421	

Applicant(s) Chunli WU

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT	
	Indep	Depend	Indep	Depend	Indep	Depend
1			1			
2				1		
3				1		
4				1		
5				1		
6				1		
7			1			
8				1		
9				1		
10				1		
11				1		
12				1		
13				1		
14				1		
15			1			
16				1		
17				1		
18			1			
19				1		
20				1		
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
Total Indep	0		4		0	
Total Depend	0	↵	16	↵	0	↵
Total Claims	0		20		0	

		*		*		*	
		Indep	Depend	Indep	Depend	Indep	Depend
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							

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
16/099,421	11/06/2018		2040	NC101437-US-PCT	20	4

CONFIRMATION NO. 8013

FILING RECEIPT

73658
Nokia
Attn: IP Docketing
200 South Mathilda Ave
Sunnyvale, CA 94086

OC000000106833544

Date Mailed: 03/19/2019

Receipt is acknowledged of this non-provisional 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 APPLICANT, 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 Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections 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**

Inventor(s)

Chunli WU, Beijing, CHINA;

Applicant(s)

Nokia Technologies Oy, Espoo, FINLAND;

Power of Attorney: The patent practitioners associated with Customer Number 73658

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/FI2017/050343 05/04/2017
which claims benefit of 62/335,280 05/12/2016

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

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: 03/15/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/099,421**

ASUS EX2019-p.205
Samsung v. ASUS
IPR2024-00614

Projected Publication Date: 06/27/2019

Non-Publication Request: No

Early Publication Request: No
Title

METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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).

ASUS EX2019-p.206
Samsung v. ASUS
IPR2024-00614

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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).

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

ASUS EX2019-p.207
Samsung v. ASUS
IPR2024-00614

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

U.S. APPLICATION NUMBER NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
16/099,421	Chunli WU	NC101437-US-PCT

73658
Nokia
Attn: IP Docketing
200 South Mathilda Ave
Sunnyvale, CA 94086

INTERNATIONAL APPLICATION NO.	
PCT/FI2017/050343	
I.A. FILING DATE	PRIORITY DATE
05/04/2017	05/12/2016

CONFIRMATION NO. 8013
371 ACCEPTANCE LETTER

OC000000106633545

Date Mailed: 03/19/2019

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

11/06/2018
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Copy of the International Application filed on 11/06/2018
- Copy of the International Search Report filed on 11/06/2018
- Preliminary Amendments filed on 11/06/2018
- Information Disclosure Statements filed on 11/06/2018
- Inventor's Oath or Declaration filed on 11/06/2018
- Request for Immediate Examination filed on 11/06/2018
- U.S. Basic National Fees filed on 11/06/2018
- Authorize Access to Search Results filed on 11/06/2018
- Priority Documents filed on 11/06/2018
- Power of Attorney filed on 11/06/2018
- Authorization to Permit Access filed on 11/06/2018
- Application Data Sheet (37 CFR 1.76) filed on 11/06/2018

FORM PCT/DO/EO/903 (371 Acceptance Notice)

ASUS EX2019-p.208
Samsung v. ASUS
IPR2024-00614

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

DEBORAH A THOMAS

Telephone: (571) 272-7175

FORM PCT/DO/EO/903 (371 Acceptance Notice)

ASUS EX2019-p.209
Samsung v. ASUS
IPR2024-00614

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
16/099,421	11/06/2018	Chunli WU	NC101437-US-PCT

CONFIRMATION NO. 8013

73658
Nokia
Attn: IP Docketing
200 South Mathilda Ave
Sunnyvale, CA 94086

PUBLICATION NOTICE

OC000000109235819

Title:METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

Publication No.US-2019-0200381-A1
Publication Date:06/27/2019

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

ASUS EX2019-p.210
Samsung v. ASUS
IPR2024-00614

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	16099421
Filing Date	2018-11-06
First Named Inventor	Chunli Wu
Art Unit	2473
Examiner Name	PATEL, HARDIKKUMAR D
Attorney Docket Number	NC101437-US-PCT

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					

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	20130136053	A1	2013-05-30	Kim et al.	
	2	20140023055	A1	2014-01-23	Jeong et al.	
	3	20100111032	A1	2010-05-06	Wu	

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	2558733	RU	C2	2015-08-10	Interdidzhital Pehjtent Kholdingz Ink	English abstract submitted	

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16099421
	Filing Date	2018-11-06
	First Named Inventor	Chunli Wu
	Art Unit	2473
	Examiner Name	PATEL, HARDIKKUMAR D
	Attorney Docket Number	NC101437-US-PCT

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

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.	T[5]
	1	Office action received for corresponding Russian Patent Application No. 2018142220, dated August 08, 2019, 8 pages of office action and 5 pages of translation available.	X

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.

ASUS EX2019-p.212
Samsung v. ASUS
IPR2024-00614

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16099421
	Filing Date	2018-11-06
	First Named Inventor	Chunli Wu
	Art Unit	2473
	Examiner Name	PATEL, HARDIKKUMAR D
	Attorney Docket Number	NC101437-US-PCT

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	/Nico van Waes/	Date (YYYY-MM-DD)	2019-09-18
Name/Print	Nico van Waes	Registration Number	61828

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.

Espacenet

Bibliographic data: RU2558733 (C2) — 2015-08-10

ACTIVATION/DEACTIVATION OF COMPONENT CARRIERS IN SYSTEMS WITH SEVERAL CARRIERS

Inventor(s): PELLET E GISLEN [CA]; MARIN E POL [CA]; RUDOL F MARIAN [CA]; TEHRRI STEFEN E [US]; OLESEN ROBERT L [US] ± (ПЕЛЛЕТЬЕ Гислен, ; МАРИНЬЕ Поль, ; РУДОЛЬФ Мариан, ; ТЭРРИ Стефен Е., ; ОЛЕСЕН Роберт Л.)

Applicant(s): INTERDIDZHITAL PEHJTENT KHOLDINGZ INK [US] ± (ИНТЕРДИДЖИТАЛ ПЭЙТЕНТ ХОЛДИНГЗ, ИНК.)

Classification: **- international:** ***H04W72/04***
- cooperative: **H04J11/0069 (KR); H04L1/1835 (KR); H04L5/001 (EP, KR, US); H04L5/0098 (EP, CN, KR, US); H04W24/10 (US); H04W52/34 (KR); H04W52/365 (EP, CN, KR, US); H04W72/0406 (US); H04W72/042 (US); H04W76/15 (EP);** H04L5/001 (CN); H04W52/34 (EP, CN, US); H04W76/19 (EP); H04W76/38 (EP)

Application number: RU20120125265 20101119

Priority number(s): US20090262810P 20091119 ; US20100293520P 20100108 ; US20100304149P 20100212 ; US20100307803P 20100224 ; US20100314446P 20100316 ; US20100330150P 20100430 ; US20100355756P 20100617 ; US20100373678P 20100813 ; WO2010US57445 20101119

Also published as: CN102668669 (A) CN102668669 (B) CN105306187 (A) CN201967138 (U) EP2502456 (A2) more

Abstract of RU2558733 (C2)

FIELD: radio engineering, communication.SUBSTANCE: invention relates to mobile communication. The technical result consists in the configuration of a wireless transmission and reception unit (WTRU) in response to parameters of configuration for resources of a downlink (DL) and an uplink (UL) of the secondary cell (SCell) when for WTRU unit there can be configured several service cells or carrier aggregation.EFFECT: improvement of communication.15 cl, 3 dwg, 3 tbl

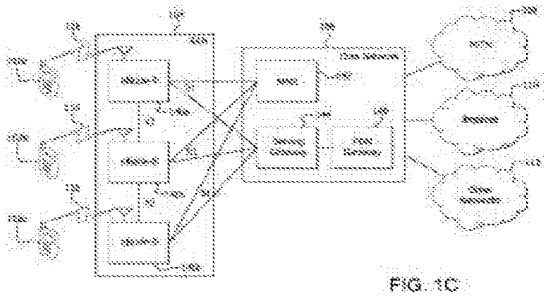


FIG. 1C

ASUS EX2019-p.215
Samsung v. ASUS
IPR2024-00614

РОССИЙСКАЯ ФЕДЕРАЦИЯ

(19) **RU** (11) **2 558 733** (13) **C2**

(51) МПК
H04W 72/04 (2009.01)

ФЕДЕРАЛЬНАЯ СЛУЖБА
ПО ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ

(12) ОПИСАНИЕ ИЗОБРЕТЕНИЯ К ПАТЕНТУ

(21)(22) Заявка: **2012125265/07, 19.11.2010**

(24) Дата начала отсчета срока действия патента:
19.11.2010

Приоритет(ы):
(30) Конвенционный приоритет:
19.11.2009 US 61/262,810;
08.01.2010 US 61/293,520;
12.02.2010 US 61/304,149;
24.02.2010 US 61/307,803;
16.03.2010 US 61/314,446;
30.04.2010 US 61/330,150;
17.06.2010 US 61/355,756;
13.08.2010 US 61/373,678

(43) Дата публикации заявки: **27.12.2013** Бюл. № **36**

(45) Опубликовано: **10.08.2015** Бюл. № **22**

(56) Список документов, цитированных в отчете о поиске: **Alcatel-Lucent, Carrier Aggregation, 3GPP TSG-RAN WG2 Meeting #67bis (R2-095888) Miyazaki, Japan, 28.10.2009, (найден 12.02.2015), найден в Интернет http://www.3gpp.org/ftp/tsg_ran/wg2_rl2/TSGR2_67bis/Docs/. Alcatel-Lucent, Component carrier indication for bandwidth extension in LTE-A, 3GPP TSG-RAN WG1 #58 (R1-093362), Shenzhen, China, 28.08.2009,** (см. прод.)

(85) Дата начала рассмотрения заявки PCT на национальной фазе: **19.06.2012**

(86) Заявка PCT:
US 2010/057445 (19.11.2010)

(87) Публикация заявки PCT:
WO 2011/063244 (26.05.2011)

Адрес для переписки:
129090, Москва, ул. Б. Спасская, 25, строение 3, ООО "Юридическая фирма Городисский и Партнеры"

(72) Автор(ы):
ПЕЛЛЕТЬЕ Гислен (CA),
МАРИНЬЕ Поль (CA),
РУДОЛЬФ Мариан (CA),
ТЭРРИ Стефен Е. (US),
ОЛЕСЕН Роберт Л. (US)

(73) Патентообладатель(и):
ИНТЕРДИДЖИТАЛ ПЭЙТЕНТ ХОЛДИНГЗ, ИНК. (US)

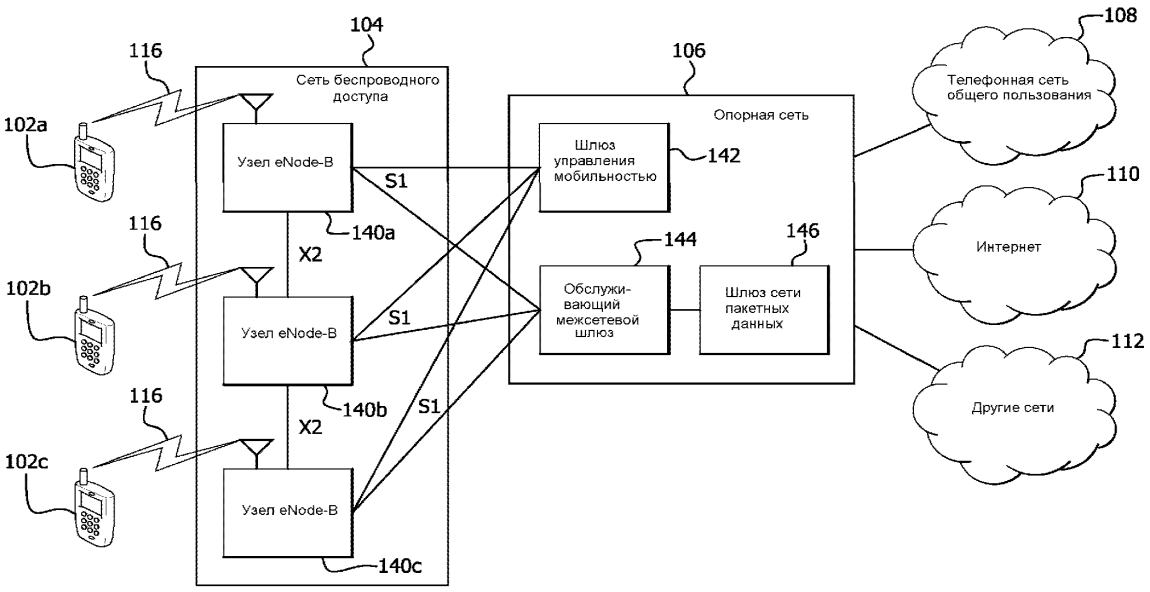
RU 2558733 C2

(54) АКТИВАЦИЯ/ДЕАКТИВАЦИЯ КОМПОНЕНТНЫХ НЕСУЩИХ В СИСТЕМАХ С НЕСКОЛЬКИМИ НЕСУЩИМИ

(57) Реферат:

ASUS EX2019-p.216
Samsung v. ASUS
IPR2024-00614

Изобретение относится к мобильной связи. Технический результат заключается в конфигурировании блока беспроводной передачи и приема (WTRU) в ответ на параметры конфигурации для ресурсов нисходящей (DL) линии связи и восходящей (UL) линии связи вторичной соты (SCell), когда для блока WTRU могут быть сконфигурированы несколько обслуживающих сот или агрегация несущих. 2 н. и 13 з.п. ф-лы, 3 ил., 3 табл.



Фиг. 1C

(30) (продолжение):
12.02.2010 61/304,149 US;
24.02.2010 61/307,803 US;
16.03.2010 61/314,446 US;
30.04.2010 61/330,150 US;
17.06.2010 61/355,756 US;
13.08.2010 61/373,678 US

(56) (продолжение):
(найден 12.02.2015), найден в Интернет http://www.3gpp.org/ftp/tsg_ran/wg1_rl1/TSGR1_58/Docs/. CATT, Carrier activation and de-activation, 3GPP TSG-RAN WG2 #68 (R2-096502), Jeju, Korea, 13.11.2009, (найден 12.02.2015), найден в Интернет. http://www.3gpp.org/ftp/tsg_ran/wg2_rl2/TSGR2_68/Docs/. RU 2007146770 A, 27.06.2009

RU 2558733 C2

RU 2558733 C2

ASUS EX2019-p.217
Samsung v. ASUS
IPR2024-00614

RUSSIAN FEDERATION

FEDERAL SERVICE
FOR INTELLECTUAL PROPERTY

(19) **RU** (11) **2 558 733** (13) **C2**

(51) Int. Cl.
H04W 72/04 (2009.01)

(12) ABSTRACT OF INVENTION

(21)(22) Application: **2012125265/07, 19.11.2010**

(24) Effective date for property rights:
19.11.2010

Priority:
(30) Convention priority:
19.11.2009 US 61/262,810;
08.01.2010 US 61/293,520;
12.02.2010 US 61/304,149;
24.02.2010 US 61/307,803;
16.03.2010 US 61/314,446;
30.04.2010 US 61/330,150;
17.06.2010 US 61/355,756;
13.08.2010 US 61/373,678

(43) Application published: **27.12.2013** Bull. № **36**

(45) Date of publication: **10.08.2015** Bull. № **22**

(85) Commencement of national phase: **19.06.2012**

(86) PCT application:
US 2010/057445 (19.11.2010)

(87) PCT publication:
WO 2011/063244 (26.05.2011)

Mail address:
129090, Moskva, ul. B. Spasskaja, 25, stroenie 3, OOO "Juridicheskaja firma Gorodisskij i Partnery"

(72) Inventor(s):
PELLET'E Gislen (CA),
MARIN'E Pol' (CA),
RUDOL'F Marian (CA),
TEhRRI Stefen E. (US),
OLESEN Robert L. (US)

(73) Proprietor(s):
INTERDIDZhITAL PEhJTENT KhOLDINGZ, INK. (US)

RU 2558733 C2

(54) ACTIVATION/DEACTIVATION OF COMPONENT CARRIERS IN SYSTEMS WITH SEVERAL CARRIERS

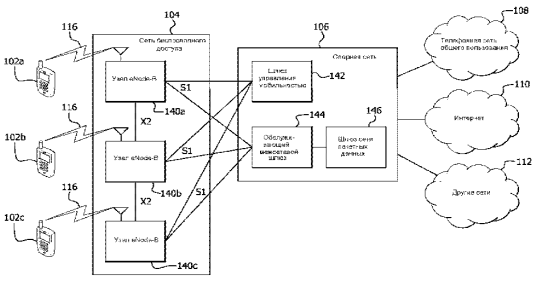
(57) Abstract:

FIELD: radio engineering, communication.

SUBSTANCE: invention relates to mobile communication. The technical result consists in the configuration of a wireless transmission and reception unit (WTRU) in response to parameters of configuration for resources of a downlink (DL) and an uplink (UL) of the secondary cell (SCell) when for WTRU unit there can be configured several service cells or carrier aggregation.

EFFECT: improvement of communication.

15 cl, 3 dwg, 3 tbl



Фиг. 1C

(30) Convention priority:

RU 2558733 C2

ASUS EX2019-p.218
Samsung v. ASUS
IPR2024-00614

12.02.2010 61/304,149 US;
24.02.2010 61/307,803 US;
16.03.2010 61/314,446 US;
30.04.2010 61/330,150 US;
17.06.2010 61/355,756 US;
13.08.2010 61/373,678 US

RU 2558733 C2

ASUS EX2019-p.219
Samsung v. ASUS
IPR2024-00614

ПЕРЕКРЕСТНАЯ ССЫЛКА НА РОДСТВЕННЫЕ ЗАЯВКИ

Эта заявка притязает на приоритет предварительных заявок на патент США № 61/262,810, поданной 19 ноября 2009 года; № 61/293,520, поданной 8 января 2010 года; № 61/304,149, поданной 12 февраля 2010 года; № 61/307,803, поданной 24 февраля 2010 года; № 61/314,446, поданной 16 марта 2010 года; № 61/330,150, поданной 30 апреля 2010 года; № 61/373,678, поданной 13 августа 2010 года; и № 61/355,756, поданной 17 июня 2010 года, информационное содержание которых включено в настоящий документ по ссылке.

ОБЛАСТЬ ТЕХНИКИ

Эта заявка относится к беспроводной связи.

УРОВЕНЬ ТЕХНИКИ

В выпуске 8 стандарта Долгосрочного развития (LTE R8) базовая станция может конфигурировать блок беспроводной передачи и приема (WTRU) с ресурсами нисходящей линией связи (DL) и восходящей линии связи (UL) на одной несущей нисходящей линии связи и одной несущей восходящей линии связи, соответственно. Можно считать, что пара несущих нисходящей линии связи и восходящей линии связи формирует соту беспроводной сети. Блок WTRU может выполнить определенные действия в ответ на конфигурацию, параметры конфигурации и проблемы доступа, относящиеся к процессу активации/дезактивации. В системе LTE R8 нет неоднозначности с точки зрения блока WTRU при выполнении действий, поскольку ресурсы нисходящей линии связи и восходящей линии связи соответствуют одной несущей нисходящей линии связи и одной несущей восходящей линии связи, соответственно, которые формируют обслуживающую соту блока WTRU. В беспроводных системах с несколькими несущими блоку WTRU могут быть назначены несколько обслуживающих сот, каждая из которых состоит из одной компонентной несущей нисходящей линии связи и возможно также из одной компонентной несущей (несущей CC) восходящей линии связи. Блоку WTRU может потребоваться действовать и ответить по-другому, если для блока WTRU могут быть сконфигурированы несколько обслуживающих сот.

СУЩНОСТЬ ИЗОБРЕТЕНИЯ

Способы и устройство, направленные на поведение блока беспроводной передачи и приема (WTRU) в ответ на конфигурацию, параметры конфигурации и проблемы доступа, относящиеся к процессу активации/деактивации, когда для блока WTRU могут быть сконфигурированы несколько обслуживающих сот или агрегация несущих.

КРАТКОЕ ОПИСАНИЕ ЧЕРТЕЖЕЙ

Более подробное понимание можно получить на основе следующего описания, данного в качестве примера, вместе с сопроводительными чертежами.

Фиг.1A - схема иллюстративной системы связи, в которой могут быть реализованы или раскрыты варианты осуществления;

Фиг.1B - схема иллюстративного блока беспроводной передачи и приема (WTRU), который может использоваться в системе связи, проиллюстрированной на Фиг.1A; и

Фиг.1C - схема иллюстративной сети беспроводного доступа и иллюстративной опорной сети, которые могут использоваться в системе связи, проиллюстрированной на Фиг.1A.

ПОДРОБНОЕ ОПИСАНИЕ

Фиг.1A является схемой иллюстративной системы 100 связи, в которой могут быть реализованы один или более раскрытых вариантов осуществления. Система 100 связи может представлять собой систему множественного доступа, которая обеспечивает содержание, такое как речь, данные, видео, обмен сообщениями, широковещание и

ASUS EX2019-p.220
Samsung v. ASUS
IPR2024-00614

т.д., нескольким пользователям беспроводной связи. Система 100 связи может позволить нескольким пользователям беспроводной связи получить доступ к такому информационному содержанию посредством совместного использования системных ресурсов, в том числе полосы частот беспроводной связи. Например, системы 100 связи могут использовать один или более методов канального доступа, таких как множественный доступ с кодовым разделением каналов (CDMA), множественный доступ с временным разделением каналов (TDMA), множественный доступ с частотным разделением каналов (FDMA), множественный доступ с ортогональным частотным разделением каналов (OFDMA), множественный доступ с частотным разделением каналов с одной несущей (SC-FDMA) и т.п.

Как показано на Фиг.1A, система 100 связи может включать в себя блоки 102a, 102b, 102c, 102d беспроводной передачи и приема (блоки WTRU), сеть 104 беспроводного доступа (сеть RAN), опорную сеть 106, телефонную сеть 108 общего пользования (PSTN), Интернет 110 и другие сети 112, хотя будет понятно, что раскрытые варианты осуществления рассматривают любое количество блоков WTRU, базовых станций, сетей и/или сетевых элементов. Каждый из блоков WTRU 102a, 102b, 102c, 102d может представлять собой устройство любого типа, выполненное с возможностью работать и/или взаимодействовать в беспроводной среде. В качестве примера блоки WTRU 102a, 102b, 102c, 102d могут быть выполнены с возможностью передавать и/или принимать сигналы беспроводной связи и могут включать в себя пользовательское оборудование (UE), мобильную станцию, стационарный или мобильный блок абонента, пейджер, мобильный телефон, карманный компьютер (PDA), смартфон, ноутбук, нетбук, персональный компьютер, сенсорную панель, беспроводной датчик, бытовую электронику и т.п.

Системы 100 связи также могут включать в себя базовую станцию 114a и базовую станцию 114b. Каждая из базовых станций 114a, 114b может представлять собой устройство любого типа, выполненное с возможностью беспроводным образом взаимодействовать по меньшей мере с одним из блоков WTRU 102a, 102b, 102c, 102d для обеспечения возможности доступа к одной или более коммуникационным сетям, таким как опорная сеть 106, Интернет 110 и/или сети 112. В качестве примера, базовые станции 114a, 114b могут представлять собой базовую приемопередающую станцию (BTS), узел B, узел eNode B, домашний узел B, домашний узел eNode B, контроллер сайта, точку доступа (AP), беспроводной маршрутизатор и т.п. Хотя каждая из базовых станций 114a, 114b изображена как единственный элемент, будет понятно, что базовые станции 114a, 114b могут включать в себя любое количество взаимно соединенных базовых станций и/или сетевых элементов.

Базовая станция 114a может являться частью сети RAN 104, которая также может включать в себя другие базовые станции и/или сетевые элементы (не показаны), такие как контроллер базовой станции (BSC), контроллер беспроводной сети (RNC), ретрансляционные узлы и т.д. Базовая станция 114a и/или базовая станция 114b могут быть выполнены с возможностью передавать и/или принимать сигналы беспроводной связи в пределах конкретной области, которая может упоминаться как сота (не показана). Сота дополнительно может быть разделена на секторы соты. Например, сота, соответствующая базовой станции 114a, может быть разделена на три сектора. Таким образом, в одном варианте осуществления базовая станция 114a может включать в себя три приемопередатчика, то есть по одному для каждого сектора соты. В другом варианте осуществления базовая станция 114a может использовать технологию с множественным входом и множественным выходом (MIMO), и поэтому может

ASUS EX2019-p.221
Samsung v. ASUS
IPR2024-00614

использовать несколько приемопередатчиков для каждого сектора соты.

Базовые станции 114a, 114b могут взаимодействовать с одним или более блоками WTRU 102a, 102b, 102c, 102d по радиоинтерфейсу (радиоинтерфейсам) 116, который может представлять собой любую подходящую линию беспроводной связи (например, радиочастотную (RF), микроволновую, инфракрасную (IR), ультрафиолетовую (UV), в видимом световом диапазоне и т.д.). Радиоинтерфейс 116 может быть установлен с использованием любой подходящей технологии беспроводного доступа (RAT).

Более определенно, как отмечено выше, система 100 связи может представлять собой систему множественного доступа и может использовать одну или более схем канального доступа, таких как CDMA, TDMA, FDMA, OFDMA, SC-FDMA и т.п. Например, базовая станция 114a в сети RAN 104 и блоки WTRU 102a, 102b, 102c могут реализовать такую беспроводную технологию, как наземный беспроводной доступ (UTRA) универсальной системы мобильной связи (UMTS), которая может установить радиоинтерфейс 116 с использованием схемы широкополосного доступа CDMA (WCDMA). Схема WCDMA может включать в себя такие протоколы связи, как высокоскоростной пакетный доступ (HSPA) и/или усовершенствованный доступ HSPA (HSPA+). Доступ HSPA может включать в себя высокоскоростной пакетный доступ нисходящей линии связи (HSDPA) и/или высокоскоростной пакетный доступ восходящей линии связи (HSUPA).

В другом варианте осуществления базовая станция 114a и блоки WTRU 102a, 102b, 102c могут реализовать такую беспроводную технологию, как усовершенствованный наземный беспроводной доступ системы UMTS (E-UTRA), которая может установить радиоинтерфейс 116 с использованием схемы Long Term Evolution (LTE) и/или схемы LTE-Advanced (LTE-A).

В других вариантах осуществления базовая станция 114a и блоки WTRU 102a, 102b, 102c могут реализовать такие беспроводные технологии, как IEEE 802.16 (то есть, широкополосный доступ в микроволновом диапазоне (WiMAX)), CDMA2000, CDMA2000 IX, CDMA2000 EV-DO, промежуточный стандарт 2000 (IS-2000), промежуточный стандарт 95 (IS-95), промежуточный стандарт 856 (IS-856), глобальная система мобильной связи (GSM), развитие стандарта GSM с увеличенной скоростью передачи данных (EDGE), сеть беспроводного доступа GSM EDGE (GERAN) и т.п.

В других вариантах осуществления базовая станция 114a и блоки WTRU 102a, 102b, 102c могут реализовать любую комбинацию упомянутых выше беспроводных технологий. Например, базовая станция 114a и блоки WTRU 102a, 102b, 102c могут реализовать двойные беспроводные технологии, такие как UTRA и E-UTRA, которые могут одновременно установить один радиоинтерфейс с использованием WCDMA и один радиоинтерфейс с использованием LTE-A, соответственно.

Базовая станция 114b на Фиг.1A может представлять собой беспроводной маршрутизатор, домашний узел B, домашний узел eNode B или точку доступа, например, и может использовать любую подходящую технологию беспроводного доступа для обеспечения возможности беспроводной связи в локализованной области, такой как место ведения бизнеса, дом, транспортное средство, университетский городок и т.п. В одном варианте осуществления базовая станция 114b и блоки WTRU 102c, 102d могут реализовать такую беспроводную технологию, как IEEE 802.11, чтобы организовать беспроводную локальную сеть (WLAN). В другом варианте осуществления базовая станция 114b и блоки WTRU 102c, 102d могут реализовать такую беспроводную технологию, как IEEE 802.15, чтобы организовать беспроводную персональную сеть (WPAN). Еще в одном варианте осуществления базовая станция 114b и блоки WTRU 102c, 102d могут использовать технологию беспроводного доступа на основе соты

ASUS EX2019-p.222
Samsung v. ASUS
IPR2024-00614

(например, WCDMA, CDMA2000, GSM, LTE, LTE-A и т.д.), чтобы организовать пикосоту или фемтосоту. Как показано на Фиг.1A, базовая станции 114b может иметь прямую связь с Интернетом 110. Таким образом, базовая станция 114b не обязательно должна получать доступ к Интернету 110 через опорную сеть 106.

Сеть RAN 104 может взаимодействовать с опорной сетью 106, которая может представлять собой сеть любого типа, выполненную с возможностью обеспечивать службы передачи речи, данных, приложений и/или речи по протоколу Интернета (VoIP) одному или более блокам WTRU 102a, 102b, 102c, 102d. Например, опорная сеть 106 может обеспечить управление вызовами, службы тарификации, службы мобильной связи на основе местоположения, заранее оплаченный вызовы, соединение с Интернетом, распространение видео и т.д. и/или выполнять функции безопасности высокого уровня, такие как аутентификация пользователя. Хотя это не показано на Фиг.1A, будет понятно, что сеть RAN 104 и/или опорная сеть 106 могут находиться в прямой или косвенной связи с другими сетями RAN, которые используют ту же самую технологию беспроводного доступа, как и сеть RAN 104, или другую технологию беспроводного доступа. Например, в дополнение к соединению с сетью RAN 104, которое может использовать беспроводную технологию E-UTRA, опорная сеть 106 также может взаимодействовать с другой сетью RAN (не показана), использующей беспроводную технологию GSM.

Опорная сеть 106 также может служить межсетевым шлюзом для блоков WTRU 102a, 102b, 102c, 102d для получения доступа к телефонной сети 108 общего пользования (PSTN), Интернету 110 и/или другим сетям 112. Телефонная сеть 108 общего пользования (PSTN) может включать в себя телефонные сети с коммутацией каналов, которые обеспечивают простую телефонную связь (POTS). Интернет 110 может включать в себя глобальную систему взаимно соединенных компьютерных сетей и устройств, которые используют общие протоколы связи, такие как протокол управления передачей (TCP), протокол пользовательских дейтаграмм (UDP) и протокол Интернета (IP) в комплекте протоколов TCP/IP. Сети 112 могут включать в себя сети проводной или беспроводной связи, которые принадлежат другим поставщикам услуг или управляются ими. Например, сети 112 могут включать в себя другую опорную сеть, соединенную с одной или более сетями RAN, которые могут использовать ту же самую технологию беспроводного доступа, как и сеть RAN 104, или другую технологию беспроводного доступа.

Некоторые или все блоки WTRU 102a, 102b, 102c, 102d в системе 100 связи могут включать в себя возможности работы в нескольких режимах, то есть блоки WTRU 102a, 102b, 102c, 102d могут включать в себя несколько приемопередатчиков для связи с разными беспроводными сетями по разным беспроводным линиям связи. Например, блок WTRU 102c, показанный на Фиг.1A, может быть выполнен с возможностью взаимодействовать с базовой станцией 114a, которая может использовать беспроводную технологию на основе соты, и с базовой станцией 114b, которая может использовать беспроводную технологию IEEE 802.

Фиг.1B является системной схемой иллюстративного блока WTRU 102. Как показано на Фиг.1B, блок WTRU 102 может включать в себя процессор 118, приемопередатчик 120, элемент 122 приема/передачи, динамик/микрофон 124, клавиатуру 126, дисплей/сенсорную панель 128, несъемную память 130, съемную память 132, источник 134 питания, схему 136 системы глобального позиционирования (GPS) и другие периферийные устройства 138. Будет понятно, что блок WTRU 102 может включать в себя любую подкомбинацию предшествующих элементов, оставаясь в соответствии с

ASUS EX2019-p.223
Samsung v. ASUS
IPR2024-00614

вариантом осуществления.

Процессор 118 может представлять собой процессор общего назначения, специализированный процессор, традиционный процессор, процессор цифровых сигналов (DSP), множество микропроцессоров, один или более микропроцессоров в сотрудничестве с ядром DSP, контроллером, микроконтроллером, специализированными интегральными схемами (ASIC), схемами с программируемыми вентильными матрицами (FPGA), интегральными схемами (IC) любого другого типа, конечным автоматом и т.п. Процессор 118 может выполнять кодирование сигналов, обработку данных, управление питанием, обработку ввода/вывода и/или любую другую функциональность, которая позволяет блоку WTRU 102 работать в беспроводной среде. Процессор 118 может быть присоединен к приемопередатчику 120, который может быть присоединен к элементу 122 приема/передачи. Хотя Фиг.1B изображает процессор 118 и приемопередатчик 120 как отдельные компоненты, будет понятно, что процессор 118 и приемопередатчик 120 могут быть интегрированы вместе в электронном пакете или микросхеме.

Элемент 122 приема/передачи может быть выполнен с возможностью передавать сигналы или принимать сигналы от базовой станции (например, базовой станции 114a) по радиоинтерфейсу 116. Например, в одном варианте осуществления элемент 122 приема/передачи может представлять собой антенну, выполненную с возможностью передавать и/или принимать радиочастотные сигналы. В другом варианте осуществления элемент 122 приема/передачи может представлять собой эмиттер/детектор, выполненный с возможностью передавать и/или принимать, например, сигналы в инфракрасном, ультрафиолетовом или видимом свете. Еще в одном варианте осуществления элемент 122 приема/передачи может быть выполнен с возможностью передавать и принимать и радиочастотные, и световые сигналы. Будет понятно, что элемент 122 приема/передачи может быть выполнен с возможностью передавать и/или принимать любую комбинацию беспроводных сигналов.

Кроме того, хотя элемент 122 приема/передачи изображен на Фиг.1B как единственный элемент, блок WTRU 102 может включать в себя любое количество элементов 122 приема/передачи. Более определенно, блок WTRU 102 может использовать технологию системы MIMO. Таким образом, в одном варианте осуществления блок WTRU 102 может включать в себя два или более элементов 122 приема/передачи, например, несколько антенн, для передачи и приема беспроводных сигналов по радиоинтерфейсу 116.

Приемопередатчик 120 может быть выполнен с возможностью модулировать сигналы, которые должны быть переданы элементом 122 приема/передачи, и демодулировать сигналы, которые приняты элементом 122 приема/передачи. Как отмечено выше, блок WTRU 102 может иметь возможность работы в нескольких режимах. Таким образом, приемопередатчик 120 может включать в себя несколько приемопередатчиков для того, чтобы позволить блоку WTRU 102 взаимодействовать через несколько технологий беспроводного доступа, например, таких как UTRA и IEEE 802.11.

Процессор 118 блока WTRU 102 может быть присоединен к динамику/микрофону 124, клавиатуре 126 и/или дисплею/сенсорной панели 128, (например, жидкокристаллическому дисплею (LCD), блоку отображения или блоку отображения на органических светодиодах (OLED)) и может принимать от них данные пользовательского ввода. Процессор 118 также может выдавать пользовательские данные динамику/микрофону 124, клавиатуре 126 и/или дисплею/сенсорной панели 128. Кроме того, процессор 118 может выполнять доступ к информации из памяти любого подходящего типа, такой как несъемная память 130 и/или съемная память 132, и

ASUS EX2019-p.224
Samsung v. ASUS
IPR2024-00614

сохранять в ней данные. Несъемная память 130 может включать в себя оперативное запоминающее устройство (RAM), постоянное запоминающее устройство (ROM), жесткий диск или устройство хранения любого другого типа. Съемная память 132 может включать в себя карту модуля идентификации абонента (SIM-карту), карту памяти, защищенную цифровую карту памяти (SD-карту) и т.п. В других вариантах осуществления процессор 118 может выполнять доступ к информации из памяти, которая физически не расположена в блоке WTRU 102, например, на сервере или домашнем компьютере (не показаны), и сохранять в ней данные.

Процессор 118 может получать питание от источника 134 питания и может быть выполнен с возможностью распределять и/или управлять питанием для других компонентов в блоке WTRU 102. Источник 134 питания может представлять собой любое подходящее устройство для обеспечения питанием блока WTRU 102. Например, источник 134 питания может включать в себя одну или более сухих батарей (например, никель-кадмиевых (NiCd), никель-цинковых (NiZn), никель-металлогидридных (NiMH), литий-ионных (Li-ion) и т.д.), солнечных батарей, топливных элементов и т.п.

Процессор 118 также может быть присоединен к схеме GPS 136, которая может быть выполнена с возможностью предоставлять информацию (например, долготу и широту) относительно текущего местоположения блока WTRU 102. В дополнение к информации из схемы GPS 136 или вместо нее блок WTRU 102 может принимать информацию о местоположении по радиоинтерфейсу 116 от базовой станции (например, базовых станций 114a, 114b) и/или определять свое местоположение на основе синхронизации сигналов, принимаемых от двух или более соседних базовых станций. Будет понятно, что блок WTRU 102 может получить информацию о местоположении посредством любого подходящего способа определения местоположения, оставаясь в соответствии с вариантом осуществления.

Процессор 118 дополнительно может быть присоединен к другим периферийным устройствам 138, которые могут включать в себя один или более программных и/или аппаратные модулей, которые обеспечивают дополнительные признаки, функциональность и/или проводную или беспроводную связь. Например, периферийные устройства 138 могут включать в себя акселерометр, электронный компас, спутниковый приемопередатчик, цифровой фотоаппарат (для фото или видео), порт универсальной последовательной шины (USB), устройство вибрации, телевизионный приемопередатчик, головную гарнитуру, модуль Bluetooth®, FM-радиоприемник, проигрыватель цифровой музыки, медиапроигрыватель, модуль для видеоигр, Интернет-браузер и т.п.

Фиг.1C является системной схемой сети RAN 104 и опорной сети 106 в соответствии с вариантом осуществления. Как отмечено выше, сеть RAN 104 может использовать беспроводную технологию E-UTRA для связи с блоками WTRU 102a, 102b, 102c по радиоинтерфейсу 116. Сеть RAN 104 также может взаимодействовать с опорной сетью 106.

Сеть RAN 104 может включать в себя узлы eNodeB 140a, 140b, 140c, хотя будет понятно, что сеть RAN 104 может включать в себя любое количество узлов eNodeB, оставаясь в соответствии с вариантом осуществления. Каждый из узлов eNodeB 140a, 140b, 140c может включать в себя один или более приемопередатчиков для связи с блоками WTRU 102a, 102b, 102c по радиоинтерфейсу 116. В одном варианте осуществления узлы eNodeB 140a, 140b, 140c могут реализовать технологию MIMO. Таким образом, узел eNodeB 140a, например, может использовать несколько антенн для передачи сигналов беспроводной связи блоку WTRU 102a и приема сигналов беспроводной связи от блока WTRU 102a.

ASUS EX2019-p.225
Samsung v. ASUS
IPR2024-00614

Каждый из узлов eNodeB 140a, 140b, 140c может соответствовать одной или более сот (не показаны), каждый, возможно, на своих несущих частотах, и может быть выполнен с возможностью обрабатывать решения по управлению беспроводными ресурсами, решения по эстафетной передаче, планирование пользователей на восходящей линии связи и/или нисходящей линии связи и т.п. Как показано на Фиг.1C, узлы eNodeB 140a, 140b, 140c могут взаимодействовать друг с другом по интерфейсу X2.

Опорная сеть 106, показанная на Фиг.1C может включать в себя шлюз 142 управления мобильностью (MME), обслуживающий межсетевой шлюз 144, и шлюз 146 сети пакетных данных (PDN). Хотя каждый из предшествующих элементов изображен как часть опорной сети 106, будет понятно, что любой из этих элементов может принадлежать объекту, отличающемуся от оператора опорной сети, и/или быть управляемым таким объектом.

Объект MME 142 может быть соединен с каждым из узлов eNodeB 142a, 142b, 142c в сети RAN 104 через интерфейс S1 и может служить узлом управления. Например, объект MME 142 может быть ответственным за аутентификацию пользователей блоков WTRU 102a, 102b, 102c, установку/конфигурацию/высвобождение несущей, выбор конкретного обслуживающего шлюза во время начального присоединения блоков WTRU 102a, 102b, 102c и т.п. Объект MME 142 также может обеспечивать функцию плоскости управления для переключения между сетью RAN 104 и другими сетями RAN (не показаны), которые используют другие беспроводные технологии, такие как GSM или WCDMA.

Обслуживающий шлюз 144 может быть соединен с каждым из узлов eNodeB 140a, 140b, 140c в сети RAN 104 через интерфейс S1. Обслуживающий шлюз 144 обычно может маршрутизировать и передавать пакеты данных пользователя блокам WTRU 102a, 102b, 102c и от них. Обслуживающий шлюз 144 также может выполнять другие функции, такие как привязка плоскостей пользователя во время эстафетных передач между узлами eNodeB, инициирование поискового вызова, когда данные нисходящей линии связи доступны для блоков WTRU 102a, 102b, 102c, управление и сохранение контекстов блоков WTRU 102a, 102b, 102c и т.п.

Обслуживающий шлюз 144 также может быть соединен со шлюзом PDN 146, который может обеспечить блоки WTRU 102a, 102b, 102c доступом к сетям с коммутацией пактов, таким как Интернет 110, чтобы обеспечить возможность связи между блоками WTRU 102a, 102b, 102c и устройствами, поддерживающими протокол IP.

Опорная сеть 106 может обеспечить возможность связи с другими сетями. Например, опорная сеть 106 может обеспечить блоки WTRU 102a, 102b, 102c доступом к сетям с коммутацией каналов, таким как телефонная сеть 108 общего пользования (PSTN), чтобы обеспечить возможность связи между блоками WTRU 102a, 102b, 102c и устройствами традиционных наземных линий связи. Например, опорная сеть 106 может включать в себя или может взаимодействовать с шлюзом протокола IP (например, сервером подсистемы мультимедиа по протоколу IP (IMS)), который служит интерфейсом между опорной сетью 106 и телефонной сетью 108 общего пользования (PSTN). Кроме того, опорная сеть 106 может обеспечить блоки WTRU 102a, 102b, 102c доступом к сетям 112, которые могут включать в себя другие проводные или беспроводные сети, которые принадлежат другим поставщикам услуг и/или управляются другими поставщиками услуг.

В дальнейшем физическим каналом управления нисходящей линии связи (каналом PDCCH) называется канал управления, используемый в системе LTE для планирования беспроводных ресурсов, например, канал управления, на котором блок WTRU принимает сообщения управляющую информацию нисходящей линии связи (DCI).

ASUS EX2019-p.226
Samsung v. ASUS
IPR2024-00614

Сообщения DCI главным образом используются для планирования ресурсов нисходящую линии связи и восходящей линии связи в области управления частоты нисходящей линии связи, на которой работает блок WTRU. Это также относится к случаю, когда блок WTRU представляет собой ретрансляционный узел eNB, для которого канал PDCCH отображается на другой канал нисходящей линии связи (например, канал PDSCH конфигурации ретрансляционного узла eNB), чтобы сформировать ретрансляционный канал PDCCH (канал R-PDCCH).

В дальнейшем термин "компонентная несущая (CC)" включает в себя без потери общности частоту, на которой работает блок WTRU. Например, блок WTRU может принимать передачи на несущей CC нисходящей линии связи (далее "несущая DL CC"). Несущая DL CC может содержать несколько физических каналов нисходящей линии связи, в том числе, но без ограничения, физический канал индикатора формата управления (PCFICH), физический канал индикатора гибридного автоматического запроса на повторение передачи (PHICH), канал PDCCH, физический канал многоадресной передачи данных (PMCH) и физический совместно используемый канал нисходящей линии связи (PDSCH). На канале PCFICH блок WTRU принимает управляющие данные, указывающие размер области управления несущей DL CC. На канале PHICH блок WTRU может принимать управляющие данные, указывающие подтверждение (ACK) или отрицательное подтверждение (NACK) гибридного автоматического запроса на повторение передачи (HARQ) для предыдущей передачи по восходящей линии связи. На канале PDCCH блок WTRU принимает сообщения DCI, которые главным образом используются для планирования ресурсов восходящей линии связи и нисходящей линии связи. На канале PDSCH блок WTRU может принимать пользовательские и/или управляющие данные. Например, блок WTRU может выполнять передачу на несущей CC восходящей линии связи (далее "несущая UL CC"). Несущая UL CC может содержать несколько физических каналов восходящей линии связи, в том числе, но без ограничения, физический канал управления восходящей линией связи (PUCCH) и физический совместно используемый канал восходящей линия связи (PUSCH). На канале PUSCH блок WTRU может передавать пользовательские и/или управляющие данные. На канале PUCCH и в некоторых случаях на канале PUSCH блок WTRU может передавать управляющую информацию восходящей линии связи (такую как индикатор качества канала/индекс матрицы предварительного кодирования/индикатор класса (CQI/PMI/RI) или запрос планирования (SR)), и/или подтверждение (ACK) или отрицательное подтверждение (NACK) запроса HARQ. На несущей UL CC блоку WTRU также могут быть распределены выделенные ресурсы для передачи опорных сигналов зондирования (SRS).

Сота обычно минимально состоит из несущей DL CC, которая факультативно соединена с несущей UL CC на основе системной информации (SI), принятой блоком WTRU либо посредством широковещательной передачи на несущей DL CC, либо с возможным использованием выделенной сигнализации конфигурации от сети. Например, при широковещательной передаче на несущей DL CC блок WTRU может принять частоту и ширину полосы восходящей линии связи присоединенной несущей UL CC как часть информационного элемента SystemInformationBlockType2 (SIB2).

В дальнейшем термин "первичная сота (PCell)" включает в себя без потери общности соту, работающую на первичной частоте, на которой блок WTRU либо выполняет процедуру установления начального соединения, либо инициирует процедуру повторного установления соединения, или соту, обозначенную как первичная сота в процедуре эстафетной передачи. Блок WTRU использует соту PCell для получения параметров

ASUS EX2019-p.227
Samsung v. ASUS
IPR2024-00614

для функций безопасности и для системной информации верхнего уровня, например, информации о мобильности NAS. Другие функции, которые могут быть поддержаны только на нисходящей линии связи соты PCell, могут включать в себя процедуры сбора информации SI и отслеживания изменений на канале широковещания (BCCH) и поисковый вызов. Несущая UL CC соты PCell может соответствовать несущей CC, ресурсы канала PUCCH которой выполнены с возможностью нести всю информацию ACK/NACK запроса HARQ для данного блока WTRU.

В дальнейшем термин "вторичная сота (SCell)" включает в себя без потери общности соту, работающую на вторичной частоте, которая может быть сконфигурирована после установления соединения RRC, и которая может использоваться для обеспечения дополнительных беспроводных ресурсов. Системная информация, важная для работы в рассматриваемой соте SCell, обычно предоставляется с использованием выделенной сигнализации, когда сота SCell добавляется к конфигурации блока WTRU. Хотя параметры могут иметь другие значения по сравнению с широковещательно передаваемыми по нисходящей линии связи рассматриваемой соты SCell с использованием сигнализации системной информации (SI), эта информация здесь упоминается как информация SI рассматриваемой соты SCell независимо от способа, используемого блоком WTRU для получения этой информации.

В дальнейшем термины "линия связи PCell DL" и "линия связи PCell UL" соответствуют без потери общности несущей DL CC и несущей UL CC соты PCell, соответственно. Аналогичным образом, термины "линия связи SCell DL" и "линия связи SCell DL" соответствуют несущей DL CC и несущей UL CC, если они сконфигурированы, соты SCell, соответственно. Для соты PCell несущая CC также может называться несущей PCC, и для соты SCell несущая CC может называться несущей SCC.

В дальнейшем термин "обслуживающая сота" включает в себя без потери общности первичную соту (то есть, соту PCell) или вторичную соту (то есть соту SCell). Более конкретно, для блока WTRU, для которого не сконфигурирована ни одна сота SCell, или который не поддерживает работу на многокомпонентных несущих (то есть агрегацию несущих), может быть только одна обслуживающая сота, состоящая из соты PCell. Для блока WTRU, для которого сконфигурирована меньшей мере одна сота SCell, термин "обслуживающие соты" включает в себя множество из одной или более сот, содержащее соту PCell и все сконфигурированные соты SCell.

Когда для блока WTRU сконфигурирована по меньшей мере с одна сота SCell, имеется одна линия связи PCell DL (то есть включающая в себя один канал DL-SCH) и одна линия связи PCell UL (то есть включающая в себя один канал UL-SCH), и для каждой сконфигурированной соты SCell имеется одна линия связи SCell DL и факультативно одна линия связи SCell UL, если она сконфигурирована.

Принципы активации и деактивация несущей CC с точки зрения блока WTRU здесь могут быть применены по меньшей мере к одной из множества функций, относящихся к несущей CC. Например, для несущей DL CC это может относиться отслеживанию/декодированию канала PDCCH из подмножества или всех форматов DCI, таких как UL DCI, DL DCI, оба формата или их подмножества, или к буферизации/декодированию канала PDSCH. Для несущей UL CC это может иметь отношение, например, к передаче канала PUSCH, передаче канала PUCCH, передаче CQI/PMI/RI или передаче SRS.

Описанные здесь способы могут быть применены к активации/деактивацию соты SCell без исключения активации/деактивации, которая является последствием реконфигурации, которая либо добавляет, либо удаляет соту SCell.

Описанные здесь примеры обычно могут быть применены независимо от того,

ASUS EX2019-p.228
Samsung v. ASUS
IPR2024-00614

сконфигурирован и/или применим ли режим DRX для обслуживающей соты (сот).

Описанные здесь способы одинаково применимы, когда любая несущая DL CC и любая несущая UL CC активируются и деактивируются независимо, в том числе несущие DL CC и несущие UL CC, соответствующие друг другу, и в том числе несущие CC, которые принадлежат либо соте PCell, либо соте SCell, и также к нескольким несущим CC, совместно использующим одно и то же состояние активации/деактивации.

Блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может быть выполненным с возможностью планирования с перекрестными несущими для одной или более обслуживающих сот. Планирование с перекрестными несущими представляет собой способ управляющей сигнализации, в котором физические беспроводные ресурсы (передача по нисходящей линии связи) для передач канала PDSCH на несущей DL CC или предоставленные ресурсы (передача по восходящей линии связи) для передач канала PUSCH на несущей UL CC первой обслуживающей соты могут быть присвоены с использованием канала PDCCH несущей DL CC второй обслуживающей соты.

Термин "несущая CC" может относиться к одной или более несущим DL CC, одной или более несущим UL CC и/или их комбинации и, в частности, к комбинации несущей DL CC и несущей UL CC, формирующей обслуживающую соту конфигурации блока WTRU (то есть, либо соту PCell, либо соту SCell). Такая комбинация несущих CC может быть достигнута посредством конфигурации блока WTRU с использованием привязок между одной или более несущими UL CC и одной или более несущими DL CC с целью присвоения ресурсов передачи нисходящей линии связи, предоставления ресурсов передачи восходящей линии связи, передачи информации обратной связи CQI/PMI/RI, информации обратной связи HARQ или для передач, относящихся к процедуре произвольного доступа (RA) и т.п.

Привязка между несколькими сконфигурированными несущими CC для данного блока WTRU может быть основана, например, по меньшей мере на одном из следующих способов: множество сконфигурированных несущих CC может быть основано на привязках восходящей/нисходящей линии связи, таких как "SIB2-привязка" (например, подбор пары по спектру, формирование соты системы на основе широковещательной передачи системной информации (SIB2), и/или на основе информации SI, переданной блоку WTRU с использованием выделенной сигнализации, и/или подбора пары для PCC восходящей/нисходящей линии связи), "привязка с планированием", например, на основе несущей CC, адресуемой для планирования из канала PDCCH другой несущей CC, "привязка с обратной связью HARQ", например, на основе отношения обратной связи HARQ (несущая DL CC, канал PUCHH восходящей линии связи и несущая UL CC, физический канал индикатора гибридного автоматического запроса на повторение передачи (PHICH) нисходящей линии связи), "выделенная привязка", например, на основе конфигурации RRC для соты (например, информационные элементы в сообщении конфигурации, которые включают по меньшей мере частоту и ширину полосы восходящей линии связи соответствующей несущей UL CC), и/или использование других типов сигнализации (например, каналы PHICH, PUCCH, PCFICH) между базовой станцией и блоком WTRU через различные несущие CC. Множество сконфигурированных несущих CC также может быть основано на привязках восходящей/восходящей линии связи, полученных из аналогичных требований опережения по времени восходящей линии связи и/или диапазонов частот, например, "привязка диапазонов". Сконфигурированные несущие CC также могут быть основаны на привязках нисходящей/нисходящей линии связи, например, полученных из планирования с перекрестными несущими на канале

ASUS EX2019-p.229
Samsung v. ASUS
IPR2024-00614

PDCCH из одной несущей DL CC для канала PDSCH другой несущей DL CC, что является дополнительным уточнением "привязки с планированием", описанной выше.

Как следствие, активация и/или деактивация данной несущей CC может быть явной с использованием управляющей сигнализации или неявной на основе некоторой привязки к другой несущей CC, например, "SIB2-привязки", "привязки с планированием", "привязки с обратной связью HARQ", "выделенной привязки", "привязки диапазонов" или их комбинации. Использование термина "рассматриваемая сота SCell" здесь может охватывать и явные, и неявные случаи и может соответствовать любому способу, используемому для обеспечения привязки между множеством несущих CC для блока WTRU.

Рассматриваемая сота SCell может являться любой сотой SCell из множества сконфигурированных сот SCell для блока WTRU, в том числе сотой SCell, которая может представлять любой объект из следующих: сота SCell, которая состоит из линии связи SCell DL, соответствующей линии связи SCell UL, линия связи SCell DL, сконфигурированная без ресурсов восходящей линии связи, например, без соответствующей линии связи SCell UL, любая линия связи SCell DL независимо от возможной соответствующей линии связи SCell UL или линия связи SCell UL независимо от возможной соответствующей линии связи SCell DL. Рассматриваемая сота SCell может или может не передавать и/или принимать собственную информацию управляющей сигнализации, например, посредством каналов PDCCH и/или PDSCH на линии связи SCell DL.

В иллюстративных способах активация и деактивация могут быть применены для соты, то есть состояние активации несущей UL CC следует за состоянием соответствующей несущей DL CC. Это может использоваться в отношении описанных здесь способов без ограничения их применимости для индивидуальных несущих CC, для соты PCell или для других способов привязки множества несущих CC. В дальнейшем термин "активация соты SCell" и "деактивация соты SCell", таким образом, включает в себя без потери общности все упомянутые выше случаи. Например, рассматриваемая сота SCell может являться сотой SCell, которая активируется и/или деактивируется неявным образом, например, по истечении работы таймера, или явным образом посредством управляющей сигнализации, с тем чтобы линия связи SCell DL и линия связи SCell UL, которые формируют соту SCell, как обозначено системной информацией, предоставленной блоку WTRU посредством выделенного и/или широковещательно передаваемой сигнализации (например, с использованием SIB2 или подобного SIB2 информационного элемента) имели одинаковое состояние активации/деактивации.

Для блока WTRU может быть сконфигурирована, по меньшей мере, с одна несущая DL CC, на которой сигнализация для активации соты SCell (деактивации в качестве альтернативы) может быть принята с использованием: сигнализации L1 (например, формат физического канала управления нисходящей линии связи (PDCCH), несущий поле индикатора компонентной несущей (CCIF), которое соответствует несущей CC, к которой применяется команда активации/деактивации; сигнализации L2 (например, управляющий элемент уровня управления доступом к среде передачи (MAC CE)); или сигнализации L3 (например, информационный элемент управления беспроводными ресурсами (RRC IE)). Каждый из способов сигнализации может использоваться блоком WTRU, чтобы определить, к какой несущей CC (например, соте SCell) применяется принятая сигнализация. В качестве примера эта сигнализация может быть принята при передаче по линии связи PCell DL, или в качестве альтернативы также при передаче для активированной линии связи SCell DL.

ASUS EX2019-p.230
Samsung v. ASUS
IPR2024-00614

Здесь описаны иллюстративные управляющие сигналы, которые могут быть отправлены/приняты при активации или деактивации и могут использоваться автономно или в комбинации.

Блок WTRU может принять и декодировать управляющую сигнализацию, чтобы активировать или деактивировать по меньшей мере одну рассматриваемую соту SCell, причем управляющая сигнализация может быть принята блоком WTRU на несущей DL CC любой из обслуживающих сот блока WTRU. Управляющая сигнализация, например, может быть скремблирована посредством идентификатора C-RNTI или посредством нового идентификатора A-RNTI_i, определенного здесь.

В частности управляющая сигнализация может быть принята блоком WTRU с использованием по меньшей мере одного из способов сигнализации L1, L2 и L3. Например, сигнализация L3 (например, RRC) может использовать информационный элемент (IE) в сообщении реконфигурации соединения RRC или другой информационный элемент. В качестве альтернативы сигнализация L2 (например, MAC) может использовать управляющий элемент (CE). В качестве альтернативы сигнализация L1 может использовать существующий формат DCI с фиксированными кодовыми точками и/или скремблированный с использованием специального идентификатора RNTI, указывающего управляющую сигнализацию с целью активации/деактивации соты SCell (например, временного идентификатора беспроводной сети для агрегирования несущих (CA-RNTI)). Сигнализация L1 также может использовать явный показатель, например, формат управляющей информации нисходящей линии связи (DCI) с полем идентификации компонентной несущей (CCIF), установленным равным значению, соответствующему рассматриваемой соте SCell, значение CCIF может представлять по меньшей мере один элемент из множества, состоящего из: идентифицирующей информации рассматриваемой соты SCell, подмножества сот SCell (например, индекс элемента в сконфигурированном множестве сот SCell) или зарезервированной кодовой точки, указывающей множество сот SCell (например, всех сконфигурированных сот SCell для блока WTRU). Формат DCI может являться расширением либо одного, либо комбинации следующих форматов: заказ канала PDCCH для произвольного доступа (RA) с помощью поля CCIF, соответствующего рассматриваемой соте SCell; присвоение нисходящей линии связи канала PDCCH с помощью поля CCIF, соответствующего рассматриваемой соте SCell; предоставление восходящей линии связи канала PDCCH с помощью поля CCIF, соответствующего рассматриваемой соте SCell; активация канала PDCCH с помощью поля CCIF, соответствующего рассматриваемой соте SCell; или любое упомянутое выше сообщение сигнализации L1 (например, канал PDCCH), L2 или L3 с явным полем, указывающим, может ли блок WTRU выполнять произвольный доступ.

Дополнительная информация может быть включена в управляющую сигнализацию для активации/деактивации. Например, информация может являться показателем, что по меньшей мере одна функция может быть ограничена подмножеством несущих CC, в том числе случай, когда функция применяется к одной несущей CC. Это может быть показателем, что блок WTRU может рассмотреть несущие CC как несущие PCC. В качестве альтернативы это может быть показателем, что отображение между несущими PCC восходящей/нисходящей линий связи может отличаться от отображения между восходящей/нисходящей линиями связи, обозначенного посредством системной информации несущей DL CC. Также это может применяться либо к несущей PCC восходящей линии связи, либо к несущей PCC нисходящей линии связи.

Здесь описаны сценарии и способы, относящиеся к тому, каким образом блок WTRU определяет идентифицирующую информацию и состояние активации/деактивации

ASUS EX2019-p.231
Samsung v. ASUS
IPR2024-00614

данной несущей CC, на которую влияет активация и деактивация сот SCell.

В одном сценарии можно влиять на идентификацию соты SCell для нескольких сот SCell при активации/деактивации. Базовая станция может сконфигурировать для блока WTRU несколько сот SCell в дополнение к соте PCell. Если некоторые или все эти соты SCell не были сразу активированы процедурой конфигурации, отдельный механизм активации/деактивации может использоваться и поддерживать адресацию отдельных сот SCell, что может потребовать, чтобы другой механизм идентифицировал соты SCell. Например, сконфигурированная сота (соты) SCell может быть первоначально деактивирована, когда она добавляется посредством процедуры реконфигурации контроллера беспроводных ресурсов (RRC) (с помощью информационного элемента управления мобильностью или без его помощи), после эстафетной передачи (например, после приема реконфигурации RRC с помощью элемента управления мобильностью), пока она сначала не активирована посредством приема управляющей сигнализации активации/деактивации, которая включает в себя явную идентифицирующую информацию соты (сот) SCell, для которой применяется управляющая сигнализация, например, посредством приема управляющего элемента (CE) MAC, активирующего одну или более деактивированных сот SCell.

В другом сценарии базовая станция может сконфигурировать для блока WTRU некоторое количество несущих DL CC, отличающееся от количества несущих UL CC. Например, может иметься больше несущих DL CC, чем несущих UL CC. Необходимо обратиться к тому, каким образом передать эту информацию блоку WTRU, в частности, если линия связи SCell DL и линия связи SCell UL могут быть активированы и деактивированы независимо от какой-либо возможной привязки, и избегать ненужного или неразрешенного доступа к ресурсам восходящей линии связи, соответствующим соте SCell, для которой восходящая линия связи может быть не конфигурирована.

С целью активизации рассматриваемой линии связи SCell DL блок WTRU может активировать рассматриваемую линию связи SCell DL на основе приема на несущей DL CC любой информации из множества, состоящего из: управляющей сигнализации для передач на рассматриваемой линии связи SCell DL (например, формат 1/1A/1B/1C/1D/2/2A DCI); любой управляющей сигнализации для рассматриваемой линии связи SCell DL, например, включающей в себя поле индикатора компонентной несущей (CCIF) рассматриваемой линии связи SCell DL; и управляющей сигнализации, использующей любой из множества предопределенных сигнальных форматов, содержащих идентифицирующую информацию рассматриваемой линии связи SCell DL, например, формат DCI, обычно используемый для сигнализации ресурсов восходящей линии связи, содержащих поле CCIF рассматриваемой линии связи SCell DL. Например, может использоваться формат DCI 0 (обычно используемый для предоставления ресурсов восходящей линии связи), формат DCI 1A (обычно используемый для присвоения нисходящей линии связи или заказа канала PDCCH для канала RACH), формат DCI 3/3A (обычно используемый для управления мощностью восходящей линии связи); или существующий формат с фиксированной кодовой точкой, в том числе любые их расширения. Другой пример может использовать элемент CE MAC активации/деактивации, содержащий битовый массив, причем каждый бит в битовом массиве соответствует заданной соте SCell и указывает, может ли сота SCell быть в активированном состоянии или в деактивированном состоянии. Рассматриваемая линия связи SCell UL может обрабатываться аналогичным образом с использованием соответствующей сигнализации и форматов.

Блок WTRU может деактивировать рассматриваемую линию связи SCell DL на основе

ASUS EX2019-p.232
Samsung v. ASUS
IPR2024-00614

приема сигнализации аналогично описанному здесь для активации линии связи SCell DL.

С целью активации рассматриваемой линии связи SCell UL блок WTRU может активировать линию связи SCell UL на основе приема управляющей сигнализации, указывающей, что ресурсы восходящей линии связи предоставлены (например, разрешение) блоку WTRU (например, формат DCI 0 или формат DCI 3/3A, например, увеличенный с помощью поля CCIF, соответствующего либо идентификатору линии связи SCell UL, либо любой линии связи SCell DL, которая может быть привязана к линии связи SCell UL), и/или указывающей, что блок WTRU может выполнить процедуру, относящуюся к передаче по восходящей линии связи (например, сообщение управления мощностью или запрос на произвольный доступ). В качестве альтернативы блок WTRU может активировать линию связи SCell UL на основе приема управляющей сигнализации для передач на линии связи SCell DL (например, формат DCI 1/1A/1B/1C/1D/2/2A), соответствующей линии связи SCell UL. Блок WTRU также может активировать линию связи SCell UL на основе приема любой управляющей сигнализации (например, включающей в себя поле CCIF для линии связи SCell DL) для линии связи SCell DL, соответствующей линии связи SCell UL.

Например, N-битовое поле CCIF (например, поле CCIF может быть представлено 3-битовым значением как показатель для 5 или более несущих CC) может представлять единое пространство нумерации для идентификации несущих DL CC. В качестве альтернативы оно может представлять единое пространство нумерации для сконфигурированных несущих UL CC. В качестве альтернативы оно может представлять единое пространство нумерации для сконфигурированных обслуживающих сот. Дополнительные кодовые точки могут использоваться для идентификации всех или подмножества обслуживающих сот в одно время. Например, они могут использоваться для идентификации сот SCell. Управляющая сигнализация (например, разрешение восходящей линии связи, назначение нисходящей линии связи, заказ выполнения произвольного доступа или команда управления мощностью) сообщения также может быть применена либо к обслуживающей соте, в которой сигнализация была принята, либо к несущей UL CC, соответствующей несущей DL CC, на которой сигнализация была принята (является ли она несущей UL CC или несущей DL CC, может зависеть от природы сигнализации, например, предназначена ли управляющая сигнализация для передачи по нисходящей линии связи или по восходящей линии связи), либо к заданной обслуживающей соте (например, к соте PCell) конфигурации блока WTRU.

Блок WTRU может деактивировать рассматриваемую линию связи SCell UL на основе приема сигнализации аналогично описанному здесь для активации линии связи SCell UL.

Для соты SCell с целью активации рассматриваемой соты SCell блок WTRU может активировать рассматриваемую линию связи SCell DL и рассматриваемую линию связи SCell UL, если ресурсы восходящей линии связи сконфигурированы для рассматриваемой соты SCell, на основе приема сигнализации аналогично описанному выше.

Для соты SCell с целью деактивации рассматриваемой соты SCell блок WTRU может деактивировать рассматриваемую линию связи SCell DL и рассматриваемую линию связи SCell UL, если ресурсы восходящей линии сконфигурированы для рассматриваемой соты SCell, на основе приема сигнализации аналогично описанному здесь для активации соты SCell.

Может ли блок WTRU активировать и/или деактивировать линию связи SCell UL на основе неявной активации соответствующей линии связи SCell DL, может зависеть от

ASUS EX2019-p.233
Samsung v. ASUS
IPR2024-00614

любого из следующих факторов. Другими словами, это может зависеть от того, принял ли блок WTRU конфигурацию для ресурсов восходящей линии связи, соответствующих линии связи SCell DL. В частности, это может зависеть от того, включает ли в себя выделенная конфигурация параметры конфигурации для ресурсов восходящей линии связи. Это также может зависеть от отсутствия (также указывающего неявное высвобождение параметров, если они сконфигурированы) для соответствующей пары восходящей/нисходящей линии связи (соты) некоторых или всех информационный элементов. Например, в информационном элементе PhysicalConfigDedicated может отсутствовать конфигурация канала PUCCH (pucch-ConfigDedicated); конфигурация канала PUSCH (pusch-ConfigDedicated); конфигурация управления мощностью (uplinkPowerControlDedicated, tpc-PDCCH-ConfigPUCCH, tpc-PDCCH-ConfigPUSCH), конфигурация измерений индикатора CQI (cqi-ReportConfig) или конфигурация зондирования (soundingRS-UL-ConfigDedicated). Также в конфигурации RRC может иметься явное указание, что заданная линия связи SCell UL не может использоваться.

В случае, когда формат DCI 1A может использоваться с целью активации соты SCell, блок WTRU может определить, что сигнализация использована с целью активации соты SCell (а не с целью заказа канала PDCCH для канала произвольного доступа (RACH) или для компактного планирования канала PDSCH) посредством проверки значения (значений) некоторых полей. Например, формат DCI 1A может быть интерпретирован как заказ активации, если поля установлены таким же образом, как для заказа канала PDCCH для канала RACH за исключением того, что один или несколько битов в одном из полей, которые установлены равными предопределенным значениям в случае заказа канала PDCCH для канала RACH, установлены равными другим значениям. В качестве альтернативы блок WTRU может определить, что сигнализация может использоваться (или не использоваться) с целью активации на основе значения поля CCIF. Например, сигнализация может быть интерпретирована как заказ канала PDCCH в случае, когда поле CCIF установлено равным заданному значению (например, 000), и как команда активации в случае, когда поле CCIF установлено равным любому другому значению, которое в этом случае представляет одну или более несущих для активации.

В одном иллюстративном способе описанная здесь управляющая сигнализация может обеспечить последовательную активацию/деактивацию. Более конкретно, блок WTRU может поддерживать список из одной или более сконфигурированных сот SCell в заданном порядке, например, на основе конфигурации (например, RRC). При приеме команды активации соты SCell блок WTRU может активировать следующую сконфигурированную, но неактивную соту SCell в списке. Аналогичным образом при приеме команды деактивации блок WTRU может деактивировать активную соту SCell, которая была активирована последней. В качестве альтернативы идентифицирующая информация активируемой/деактивируемой соты SCell может быть получена неявно из идентифицирующая информации соты SCell, от которой принята команда активации/деактивации. Последовательная активация/деактивация может произойти в пределах сконфигурированного множества сот SCell (например, активация/деактивация множества 1 сот SCell может иметь приоритет над множеством 2 и т.д.).

В другом иллюстративном способе временный идентификатор беспроводной сети (RNTI) может быть выделен для идентификации управляющей сигнализации, отправленной на канале PDCCH. Он может использоваться блоком WTRU, чтобы определить, должен ли он выполнять действия для принятой управляющей сигнализации и для какой сигнализации он делает попытку декодирования. В дальнейшем термин A-RNTI_i используется для обозначения идентификатора RNTI, зарезервированного для

ASUS EX2019-p.234
Samsung v. ASUS
IPR2024-00614

функциональности активации/деактивации. Описанный здесь идентификатор A-RNTI_i может иметь выделенные блоком WTRU значения идентификатора RNTI, например, одно для каждой несущей CC, соты SCell и/или для команды активации/деактивации или идентичные значения идентификатора RNTI, например, единственный идентификатор RNTI для идентификации команды активации/деактивации и/или для указания, что команда применима ко всем сконфигурированным сотам SCell. Блок WTRU может принять и декодировать в любой обслуживающей соте управляющую сигнализацию (скремблированную с помощью идентификатора C-RNTI или A-RNTI_i), чтобы активировать по меньшей мере одну рассматриваемую соту SCell.

Здесь описаны сценарии и способы, относящиеся к неявной и явной активации и деактивации данной несущей CC, на которую влияет активация и деактивация сот SCell.

Если несущая DL CC активируется, для чего может быть активирован соответствующий канал PDCCH, и в случае, если планирование с перекрестными несущими возможно от этого канала PDCCH, может быть желательно иметь способы гарантировать, что любые другие соответствующие соты SCell могут быть запланированы как можно скорее. Это предполагает, что отношение планирования с перекрестными несущими между разными сконфигурированными обслуживающими сотами известно (например, сконфигурировано) во время, когда принята команда активации. Иначе, если это отношение не известно, может быть полезно обеспечить для блока WTRU средство для определения, какая несущая DL CC может использоваться для планирования недавно активированной соты (сот) SCell, на основе управляющей сигнализации активации. Например, блок WTRU может принять в сообщении RRC, которое конфигурирует конфигурацию выделенных физических беспроводных ресурсов для соты SCell, например, информационный элемент PhysicalConfigDedicatedSCell, конфигурацию для планирования с перекрестными несущими соты SCell, например, информационный элемент CrossCarrierSchedulingConfig, конфигурация включает в себя идентифицирующая информацию обслуживающей соты, используемой для планирования соты SCell в случае, если планирование с перекрестными несущими применимо к соте SCell.

Когда блок WTRU активирует рассматриваемую соту SCell, блок WTRU может активировать линию связи SCell DL на основе приема управляющей сигнализации. Если блок WTRU выполнен с возможностью отслеживать канал PDCCH нисходящей линии связи рассматриваемой соты SCell, блок WTRU может дополнительно активировать любую другую соту SCell, для которой упомянутый канал PDCCH также может обеспечить управляющую сигнализацию (например, присвоения нисходящей линии связи, разрешения восходящей линии связи, другие сообщения управления, например, команды управления мощностью). Таким образом, блок WTRU может активировать любую другую соту SCell, для которой может быть применено планирование с перекрестными несущими от канала PDCCH нисходящей линии связи рассматриваемой соты SCell. Иными словами, если сота SCell не является активной, и эта сота SCell выполнена с возможностью планирования с перекрестными несущими для рассматриваемой соты SCell или альтернативно от рассматриваемой соты SCell, то блок WTRU может дополнительно активировать эту соту SCell вместе с рассматриваемой сотой SCell.

Когда блок WTRU деактивирует рассматриваемую соту SCell, блок WTRU может деактивировать вторую соту SCell после деактивации рассматриваемой линии связи SCell DL, если рассматриваемая линия связи SCell DL ранее использовалась для обеспечения управляющей сигнализации (например, присвоения нисходящей линии

ASUS EX2019-p.235
Samsung v. ASUS
IPR2024-00614

связи, разрешения восходящей линии связи, других сообщений управления, например, команд управления мощностью), и/или если какая-либо управляющая сигнализация далее не возможна для второй соты SCell после деактивации рассматриваемой соты SCell. Например, если рассматриваемая сота SCell деактивирована, что может быть необходимо в целях управляющей сигнализации для второй несущей CC, то блок WTRU также может деактивировать вторую соту SCell.

Здесь описаны иллюстративные способы, относящиеся к приему управляющей сигнализации активации/деактивации.

В одном сценарии может быть желательно инициировать дополнительную процедуру (процедуры) блока WTRU при активации/деактивации рассматриваемой соты SCell. Это может быть достигнуто либо неявно на основе изменения состояния активации/деактивации рассматриваемой соты SCell, либо явно посредством включения дополнительной сигнальной информации в команду активации/деактивации.

Иллюстративные способы, относящиеся к приему управляющей сигнализации активации/деактивации, могут представлять собой любой способ из следующих: при приеме блоком WTRU управляющей сигнализации блок WTRU может активировать/деактивировать/высвободить ранее сконфигурированные выделенные ресурсы нисходящей линии связи для соты SCell, такие как ресурсы полупостоянного планирования (SPS); блок WTRU может инициировать отчет запаса мощности блока WTRU для несущей CC при активации несущей CC; блок WTRU может инициировать внутренний отчет отказа HARQ для процесса запросов HARQ для верхнего уровня (уровней), (например, для управления линией беспроводной связи (RLC)) после явной или неявной деактивации соты SCell с сконфигурированными ресурсами восходящей линии связи с использованием служб объекта HARQ, управляющих процессом запросов HARQ, чтобы снизить задержку повторных передач; блок WTRU может определить режим передачи для использования для управляющей сигнализации восходящей линии связи, формат передачи может зависеть от количества сконфигурированных (или в качестве альтернативы активных), сота SCell, например, режим передачи обратной связи HARQ и/или информации CQI/PMI/RI на канале PUCCH; блок WTRU может определить ресурсы для подтверждения управляющей сигнализации для (де)активации соты SCell; блок WTRU может определить поведение несущей CC при активации, например, какой ресурс и на какой несущей CC информация обратной связи HARQ или CQI/PMI/RI может быть отправлена для передач канала PDSCH, и может ли блок WTRU отслеживать канал PDCCH в недавно активированной соте SCell; блок WTRU может определить поведение блока WTRU MAC при реконфигурации, в том числе удаление по меньшей мере одной соты SCell; блок WTRU может определить поведение блока WTRU MAC при деактивации по меньшей мере одной соты SCell; блок WTRU может определить, используется ли планирование с перекрестными несущими для несущих CC при активации; или блок WTRU может определить размер области управления активируемой соты SCell (например, информация, обычно находимая блоком WTRU на канале PCFICH, которая позволяет блоку WTRU определять расположение во времени первого символа PDSCH), особенно для линии связи SCell DL, для которой используется планирование с перекрестными несущими.

Могут использоваться дополнительные иллюстративные способы, относящиеся к приему управляющей сигнализации активации/деактивации, в частности, если каждая сконфигурированная несущая UL CC привязана к одной или более несущим DL CC, например, посредством "SIB2-привязки", "выделенной привязки", "привязки с обратной связью HARQ", "привязки с планированием" или "привязки диапазонов", как описано

ASUS EX2019-p.236
Samsung v. ASUS
IPR2024-00614

выше, или с использованием управляющей сигнализации между базовой станцией и блоком WTRU через разные несущие CC. Описанные здесь способы могут использоваться блоком WTRU при приеме управляющей сигнализации от базовой станции в описанных ниже целях. Прием управляющей сигнализации может инициировать процедуры блока WTRU для получения/поддержки опережения по времени восходящей линии связи блока WTRU, необходимого для выполнения передач на ресурсах восходящей линии связи, соответствующей обслуживающей соте, и может инициировать процедуры блока WTRU для получения/поддержки системной информации SI блока WTRU, необходимой для получения доступа к ресурсам восходящей линии связи, соответствующей несущей CC, и/или может инициировать процедуру блока WTRU для получения доступа к ресурсам нисходящей линии связи одной или более несущих DL CC, соответствующих несущей UL CC. Это также может использоваться для инициирования процедур блока WTRU для активации/деактивации/высвобождения ранее сконфигурированных выделенных ресурсов восходящей линии связи для несущей UL CC, таких как ресурсы канала PUCCH, выделенные для CQI, PMI, RI и SR; ресурсы SPS или ресурсы SRS.

Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может при активации рассматриваемой соты SCell, для которой применимый таймер TAT не работает, инициировать передачу процедуры произвольного доступа на ресурсе канала PRACH рассматриваемой соты SCell.

Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может не передавать SRS для рассматриваемой соты SCell, когда рассматриваемая сота SCell деактивируется.

Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может не сообщать CQI, PMI или RI для рассматриваемой соты SCell, когда рассматриваемая сота SCell деактивируется.

Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может не выполнять передачу на канале PUSCH для ресурсов SPS, когда рассматриваемая сота SCell деактивируется, если по меньшей мере один ресурс SPS сконфигурирован для рассматриваемой соты SCell.

Для иллюстративных способов, описанных здесь далее, управляющая сигнализация, принятая блоком WTRU от базовой станции, может представлять собой сообщения L1 (например, канал PDCCH), L2 (например, MAC) или L3 (например, RRC). Сообщение может применяться к подмножеству (например, к одной или больше) сконфигурированных сот SCell. Сигнализация может быть принята на несущей DL CC, которая уже является активной, например, на линии связи PCell DL. В качестве альтернативы сигнализация может быть принята на несущей DL CC, которая уже является активной, например, в любой активной обслуживающей соте и применяется к другой соте SCell.

В другом сценарии может быть желательно улучшить надежность процедуры (де) активации, чтобы гарантировать согласованный вид доступных ресурсов и с точки зрения базовой станции, и с точки зрения блока WTRU. Это может быть достигнуто посредством передачи явного подтверждения команды активации/деактивации, например, с использованием механизма, аналогичного "обратной связи HARQ" на канале PUCCH.

Другой аспект описанных способов направлен на то, каким образом блок WTRU, для которого сформирована по меньшей мере одна сота SCell, может определить, на каком ресурсе следует передать подтверждение, при приеме управляющей сигнализации

ASUS EX2019-p.237
Samsung v. ASUS
IPR2024-00614

для активации/деактивации по меньшей мере одной соты SCell, для которой может быть отправлено подтверждение.

Здесь описаны иллюстративные способы, в которых при приеме управляющей сигнализации, для которой может ожидаться, что блок WTRU передаст информацию обратной связи (например, подтверждение), блок WTRU может определить, что информация обратной связи может быть передана в ресурсе (например, в формате и/или расположении и/или кодировании канала) области управления (например, в области канала PUCCH) несущей UL CC, если несущая UL CC сконфигурирована для всех передач информации обратной связи HARQ (например, линия связи PCell UL), несущая UL CC привязана (например, спарена) к несущей DL CC, на которой была принята управляющая сигнализация, и/или несущая UL CC сконфигурирована в целях передачи информации обратной связи. Кроме того, расположение на упомянутой выше несущей UL CC соответствует одному элементу множества, состоящего из: ресурса (например, расположения), вычисленного на основе первого элемента CCE канала PDCCH, который указывает присутствие управляющей сигнализации, одного из множества сконфигурированных (например, RRC) ресурсов (например, формат и/или расположение и/или кодирование канала), указанного посредством индекса, который может быть обеспечен в управляющей сигнализации; или в комбинации с любым из упомянутого выше, смещения ресурса (например, расположения) от области PUCCH несущей UL CC, причем смещение может быть получено на основе индекса для соответствующей несущей DL CC.

Другой аспект описанных способов направлен на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может определить, может ли сота SCell быть активирована/деактивирована, при приеме управляющей сигнализации.

Описанные здесь примеры могут включать в себя случай, в котором по меньшей мере часть управляющей сигнализации может быть принята блоком WTRU как конфигурация для операции с несколькими несущими, даже когда начальное состояние соты SCell при (ре)конфигурации является "деактивированным". В частности начальные значения для параметров, относящихся к аспектам приема блока WTRU на линии связи SCell DL, например, могут быть по меньшей мере одним значением из множества, состоящего из: значения канала PCFICH или CFI, указывающего размер области управления; показателя относительно того, может ли использоваться CFI; значения таймера TAT или команды TAC; одного или более индикаторов RNTI для блока WTRU, например, специфического для SCell индикатора C-RNTI, индикатора CA-RNTI, индикатора A-RNTI_i, как описано выше). Кроме того, начальные значения для параметров, относящихся к аспектам передачи блока WTRU на несущей UL CC, например, могут быть по меньшей мере одним значением из множества, состоящего из выделенного ресурса обратной связи HARQ и/или индекса для конфигурации измерений. Это может быть включено в конфигурацию блока WTRU соответствующих упомянутых несущих CC.

Здесь описаны сценарии и способы, относящиеся к тому, каким образом блок WTRU, для которого сформирована по меньшей мере с одна сота SCell, определяет размер области управления на данной линии связи SCell DL, на которую влияет активация и деактивация сот SCell.

Прежде чем блок WTRU может декодировать канал PDSCH на недавно активированной соте SCell, он может сначала определить расположение первого символа канала PDSCH. Когда для данной обслуживающей соты нет перекрестного

ASUS EX2019-p.238
Samsung v. ASUS
IPR2024-00614

планирования, блок WTRU обычно декодирует физический канал индикатора формата управления (далее канал PCFICH). Канал PCFICH может быть найден в заданном расположении (расположениях), известном блоку WTRU, и его значение может изменяться в любом субкадре. Канал PCFICH указывает размер области управления несущей DL CC, в которой он переносится (например, является он равным 0, 1, 2, 3 или 4 символам). Когда блок WTRU знает размер области управления, он может неявно определить расположение первого символа канала PDSCH. Когда используется планирование с перекрестными несущими, блок WTRU может не иметь возможности декодировать PCFICH для запланированных ресурсов, или канал PCFICH может не быть доступен, и, таким образом, для блока WTRU может быть желательно средство определить размер области управления для данной обслуживающей соты (например, сконфигурированной соты SCell).

Информация в управляющей сигнализации, принятой блоком WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, также может включать в себя индикатор формата управления (CFI). Блок WTRU может использовать индикатор CFI, чтобы определить размер области управления несущей DL CC. В частности, активируемая несущая DL CC может являться вторичной несущей CC блока WTRU. Другими словами, когда блок WTRU выполнен с возможностью планирования с перекрестными несущими, блоку WTRU можно предоставить начальный символ OFDM канала PDSCH для рассматриваемой соты SCell в пределах управляющей сигнализации RRC, которая конфигурирует рассматриваемую соту SCell, и/или которая конфигурирует блок WTRU для планирования с перекрестными несущими, то есть значение, которое использует блок WTRU, когда рассматриваемая сота SCell активируется, значение указывает размер области управления линии связи SCell DL рассматриваемой соты SCell.

Здесь описаны иллюстративные способы обработки планирования с перекрестными несущими. Для восходящей линии связи или несущей DL CC с целью планирования с перекрестными несущими (например, канал PDSCH в случае несущей DL CC и канал PUSCH в случае несущей UL CC) несущей CC (или нескольких несущих CC в случае, если управляющая сигнализация активирует более одной соты SCell сразу) блок WTRU определяет, какой канал (каналы) PDCCH, соответствующий какой несущей (несущим) DL CC, может обеспечить управляющую сигнализацию (например, назначения нисходящей линии связи, разрешения восходящей линии связи, другие сообщения управления, например, команды управления мощностью) для несущей CC с использованием по меньшей мере одного из следующих способов.

В одном примере блок WTRU может определить, что канал PDCCH линии связи SCell DL, для которой применима управляющая сигнализация для активации соты SCell (то есть рассматриваемой соты SCell), может использоваться для планирования рассматриваемой соты SCell (то есть поведение, аналогичное для обслуживающих сот Rel-8). Для случая линии связи SCell DL это может быть основано на явном показателе относительно того, может ли блок WTRU декодировать канал PDCCH для рассматриваемой линии связи SCell DL. В другом примере блок WTRU может определить, что канал PDCCH несущей DL CC, от которой принята управляющая сигнализация для активации соты SCell, может также использоваться для планирования рассматриваемой соты SCell (то есть планирования с перекрестными несущими от несущей DL CC, на которой была принята команда активации). В другом примере блок WTRU может определить, что канал PDCCH несущей DL CC (например, канал PDCCH соты PCell) может также использоваться для планирования рассматриваемой соты SCell, на основе

ASUS EX2019-p.239
Samsung v. ASUS
IPR2024-00614

конфигурации, принятой для рассматриваемой соты SCell (например, конфигурации RRC).

Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может определить при активации рассматриваемой соты SCell, что канал PDCCH рассматриваемой линии связи SCell DL может использоваться для приема управляющей сигнализации (например, DCI) для планирования на основе конфигурации рассматриваемой соты SCell, например, принятой в сообщении RRC, которое включает в себя конфигурацию рассматриваемой соты SCell для выделенных физических беспроводных ресурсов, например, информационный элемент PhysicalConfigDedicatedSCell, который включает в себя конфигурацию для планирования с перекрестными несущими соты SCell, например, информационный элемент CrossCarrierSchedulingConfig, указывающий, что планирование с перекрестными несущими не используется для рассматриваемой соты SCell. Кроме того блок WTRU также может определить размер области управления на основе параметра, например, значения, указывающего первый символ канала PDSCH рассматриваемой соты SCell, принятого в сообщении RRC, которое сконфигурировало рассматриваемую соту SCell, например, в конфигурации для планирования с перекрестными несущими соты SCell. В качестве альтернативы, если конфигурация включает в себя идентифицирующую информацию обслуживающей соты, от которой рассматриваемая сота SCell запланирована, блок WTRU может определить, что канал PDCCH несущей DL CC упомянутой обозначенной обслуживающей соты может использоваться для планирования передачи для рассматриваемой соты SCell.

Блок WTRU также может деактивировать соту SCell, если блок WTRU принимает сигнализацию от сети, указывающую, что может быть выполнена эстафетная передача. Например, это может произойти при приеме сообщения RRCConnectionReconfiguration, включающего в себя информационный элемент mobilityControlInfo. Блок WTRU также может деактивировать соту SCell, если блок WTRU запускает таймер эстафетной передачи, такой как таймер T304.

В другом примере блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может деактивировать все сконфигурированные соты SCell после обработки управляющей сигнализации, указывающей, что блок WTRU должен выполнить эстафетную передачу в другую обслуживающую соту, например, после обработки сообщения реконфигурации RRC с элементом информации управления мобильностью. Сота SCell конфигурации блока WTRU тогда может быть сначала активирована посредством приема управляющей сигнализации активации/деактивации, которая включает в себя явную идентифицирующая информацию соты (сот) SCell, для которой управляющая сигнализация применяется, например, посредством приема управляющего элемента MAC активации/деактивации, активирующего одну или более деактивированных сот SCell.

Здесь описаны иллюстративные способы, которые следуют за состоянием ошибки. Блок WTRU может деактивировать рассматриваемую соту SCell, если происходит по меньшей мере одно из следующих условий. Блок WTRU может деактивировать рассматриваемую соту SCell, если блок WTRU инициирует процедуру повторного установления соединения RRC, или если блок WTRU запускает таймер T311 (инициирование процедуры повторного установления соединения RRC). Например, если заданная несущая CC, для которой обнаружен отказ линии беспроводной связи (RLF), является сотой PCell конфигурации блока WTRU, как следствие блок WTRU деактивирует все сконфигурированные/активные соты SCell на при отказе RLF по

ASUS EX2019-p.240
Samsung v. ASUS
IPR2024-00614

меньшей мере для упомянутой соты PCell. Другими словами, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может деактивировать все сконфигурированные соты SCell, когда блок WTRU инициирует процедуру повторного установления соединения RRC после того, как он определяет отказ RLF нисходящей линии связи и/или восходящей линии связи для соты PCell. Блок WTRU также может деактивировать рассматриваемую соту SCell, если блок WTRU может обнаружить отказ RLF на заданной несущей CC в некоторых ситуациях. Например, если заданная сота SCell является сотой SCell конфигурации блоков WTRU, блок WTRU может деактивировать заданную соту SCell после того, как он определяет отказ RLF нисходящей линии связи и/или восходящей линии связи для упомянутой заданной соты SCell. Во всех упомянутых выше случаях конфигурация деактивированной соты (сот) SCell может быть удалена из конфигурации блока WTRU. В другом примере заданная несущая CC, для которой обнаружен отказ RLF, может являться сотой SCell конфигурации блока WTRU, в том числе когда по меньшей мере упомянутая сота SCell деактивирована после обнаружения отказа RLF для соты SCell. В этом случае конфигурация деактивированной соты (сот) SCell может быть удалена из конфигурации блока WTRU.

Блок WTRU также может деактивировать рассматриваемую соту SCell, если блок WTRU терпит неудачу в процедуре реконфигурации. Например, деактивация может произойти, когда потерпевшая неудачу реконфигурация могла быть выполнена вследствие приема сигнализации RRC от базовой станции (например, RRCConnectionReconfiguration), реконфигурация могла быть применима к рассматриваемой соте SCell, или реконфигурация могла быть применима к соте PCell.

Здесь описаны сценарии и способы, относящиеся к передачам блоком WTRU на сконфигурированных ресурсах нисходящей линии связи и/или восходящей линии связи, на которые влияет активация и деактивация сот SCell. Такие ресурсы сконфигурированы для блока WTRU посредством выделенной сигнализации и могут включать в себя ресурсы передачи периодического выделенного опорного сигнала зондирования (SRS), ресурсы SPS восходящей линии связи и/или нисходящей линии связи, периодическую передачу CQI, PMI, RI либо при распределении выделенных ресурсов канала PUCCH, либо при передаче канала PUSCH, выделенный ресурс для передачи запроса SR на канале PUCCH, конфигурацию для передачи информации обратной связи сигнала ACK/NACK HARQ на одном или более ресурсах канала PUCCH и т.п.

В одном сценарии для блока WTRU может быть выполнена конфигурация выделенных беспроводных ресурсов, когда он имеет соединение с базовой станцией. Когда соты SCell активируются и позже деактивируются, может быть необходимо обратиться к тому, каким образом обрабатывать выделенные ресурсы, чтобы избежать создания блоком WTRU помех с другими блоками WTRU в рассматриваемой обслуживающей соте, для которой выделенные ресурсы могут быть сконфигурированы, и минимизировать дополнительные накладные расходы.

Описанные способы также направлены на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, при активации/деактивации данного подмножества (то есть, одной или более), сот SCell может определить, может ли он начать/остановить/высвободить сконфигурированные выделенные ресурсы восходящей линии связи, например, канал PUCCH для ресурсов CQI/PMI/RI, SRS или SPS и выполнить процедуру для начала/остановки/высвобождения сконфигурированных ресурсов восходящей линии связи, если нужно.

Описанные способы также направлены на то, каким образом блок WTRU, для

ASUS EX2019-p.241
Samsung v. ASUS
IPR2024-00614

которого сконфигурирована по меньшей мере одна сота SCell, при приеме управляющей сигнализации для активации/деактивации по меньшей мере одной рассматриваемой соты SCell может определить ресурсы и соответствующую несущую UL CC, на которой следует передать информацию обратной связи HARQ, а также может ли он отслеживать канал PDCCH, соответствующий активированной рассматриваемой соте (сотам) SCell.

Когда блок WTRU активирует рассматриваемую соту SCell с целью обработки сконфигурированных ресурсов восходящей линии связи для рассматриваемой соты SCell, блок WTRU может начать использовать сконфигурированные ресурсы восходящей линии связи, если происходит по меньшей мере одно из следующих условий: если принятая управляющая сигнализация включает в себя показание активировать сконфигурированные ресурсы восходящей линии связи, соответствующие рассматриваемой соте SCell (например, для SPS, для SRS и на канале PUCCH для CQI, SR, PMI, RI); если допустимо опережение по времени, применимое к ресурсам восходящей линии связи, соответствующей рассматриваемой соте SCell; или если управляющая сигнализация принята на канале PDCCH и скремблирована с использованием заданного идентификатора RNTI (например, A-RNTI_2).

Описанные способы также направлены на то, каким образом блок WTRU при деактивации данного подмножества (то есть, одной или более) сот SCell может определить, может ли он высвободить сконфигурированные выделенные ресурсы нисходящей линии связи, например, ресурсы SPS, и выполнить процедуру для высвобождения сконфигурированных ресурсов нисходящей линии связи, если нужно.

Когда блок WTRU активирует рассматриваемую соту SCell с целью обработки сконфигурированных ресурсов нисходящей линии связи для рассматриваемой соты SCell, блок WTRU может начать использовать эти ресурсы, если происходит одно из следующих условий: если принятая управляющая сигнализация включает в себя показание активировать сконфигурированные ресурсы нисходящей линии связи, соответствующие рассматриваемой соте SCell (например, для SPS), или если управляющая сигнализация принята на канале PDCCH и скремблирована с использованием заданного идентификатора RNTI (например, A-RNTI_3).

Когда блок WTRU деактивирует рассматриваемую соту SCell с целью обработки сконфигурированных ресурсов нисходящей линии связи для сконфигурированной соты SCell, блок WTRU может высвободить конфигурацию для этих ресурсов при возникновении любой из следующих ситуаций. Блок WTRU может выполнить высвобождение, если принятая управляющая сигнализация включает в себя показание высвободить сконфигурированные средства нисходящей линии связи, соответствующие рассматриваемой соте SCell (например, для SPS), или если управляющая сигнализация принята на канале PDCCH и скремблирована с использованием заданного идентификатора RNTI (например, A-RNTI_5).

В другом примере управляющая сигнализация может содержать показание относительно того, может ли блок WTRU продолжить использовать ранее сконфигурированные ресурсы восходящей/нисходящей линии связи, например, ресурсы канала PUCCH для сигнала ACK/NACK, ресурсы канала PUCCH для разрешения и/или назначения CQI/PMI/RI/SR, SRS, SPS и т.п. или их частей. Это может быть индекс для элемента в множестве ранее сконфигурированных ресурсов восходящей/нисходящей линии связи. Например, блок WTRU может использовать сконфигурированный ресурс активируемой соты SCell, и/или блок WTRU может использовать сконфигурированный ресурс данной обслуживающей соты (например, соты PCell) после деактивации соты SCell.

ASUS EX2019-p.242
Samsung v. ASUS
IPR2024-00614

В другом примере блок WTRU может прекратить использовать сконфигурированный ресурс деактивируемой соты SCell, и/или блок WTRU может прекратить использовать сконфигурированный ресурс данной обслуживающей соты (например, соты PCell) после деактивации другой соты SCell.

Когда блок WTRU деактивирует рассматриваемую соту SCell с целью обработки сконфигурированных ресурсов восходящей линии связи для рассматриваемой соты SCell, блок WTRU может высвободить конфигурацию для любых ресурсов восходящей линии связи для SRS, для CQI/PMI/RI/SR на канале PUCCH и для SPS при возникновении любой из следующих ситуаций. Блок WTRU может высвободить конфигурацию, если принятая управляющая сигнализация включает в себя показание высвободить ресурсы восходящей линии связи для SRS и CQI/PMI/RI/SR на канале PUCCH и для SPS для рассматриваемой соты SCell. Блок WTRU может высвободить конфигурацию, если управляющая сигнализация принята на канале PDCCH и скремблирована с использованием заданного идентификатора RNTI, (например, A-RNTI_4). Блок WTRU может высвободить конфигурацию, когда опережение по времени, применимое к ресурсам восходящей линии связи рассматриваемой соты SCell, больше не допустимо (например, соответствующий таймер TAT истекает после деактивации) после деактивации.

Здесь описаны дополнительные иллюстративные способы обработки опорных сигналов зондирования (SRS).

В другом сценарии базовая станция может сконфигурировать специфический для блока WTRU ресурс периодических сигналов SRS для передачи SRS на беспроводных ресурсах несущей UL CC. При условии, что не будет явной активации/деактивации для ресурсов SRS, например, на основе состояния PUSCH несущей UL CC, может быть желательно иметь способы избежать передачи SRS, пока блок WTRU не является активным, в передачах восходящей линии связи на канале PUSCH. Другими словами, если управляющая сигнализация активации/деактивации не применима к несущим UL CC, может быть желателен механизм, чтобы приостановить периодические передачи на сконфигурированных ресурсах SRS упомянутой несущей UL CC.

Описанные способы также направлены на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может определить, может ли он передать сигналы SRS на сконфигурированном периодическом ресурсе (или ресурсах), пока передачи канала PUSCH не активны в данной линии связи SCell UL.

Для несущей UL CC с целью определения, следует ли передавать сигналы SRS на сконфигурированном ресурсе SR в данной несущей UL CC, блок WTRU начинает (или продолжает) передачу сигналов SRS на несущей UL CC с использованием сконфигурированных ресурсов SRS. В частности, блок WTRU может начать или повторно начать, если уже работает таймер (например, SRS-InactivityTimer): при (ре) конфигурации несущей UL CC, не удаляющей несущую UL CC; при приеме разрешения восходящей линии связи для канала PUSCH для несущей UL CC; при передаче канала PUSCH на несущей UL CC; при инициализации или передаче SR и/или BSR, которые могут быть в комбинации с достижением буфером блока WTRU сконфигурированного порога; при достижении буферами блока WTRU сконфигурированного порога; или при явной сигнализации, например, L1 PDCCH или управляющий элемент L2 MAC.

Тогда блок WTRU может передать сигналы SRS на несущей UL CC с использованием сконфигурированных ресурсов сигналов SRS в течение предопределенного времени после возникновения одного из упомянутых выше событий. Таким образом, передача

ASUS EX2019-p.243
Samsung v. ASUS
IPR2024-00614

останавливается после заданного периода неактивности восходящей линии связи для несущей CC. В одном варианте осуществления это может быть реализовано посредством передачи сигналов SRS на несущей UL CC с использованием сконфигурированных ресурсов сигнала SRS и остановки передачи сигнала SRS на несущей UL CC, когда истекает таймер, например, SRS-InactivityTimer.

Когда блок WTRU деактивирует рассматриваемую соту SCell, блок WTRU может остановить любые передачи восходящей линии связи (канал UL-SCH, PUCCH, SRS) для деактивированной линии связи SCell UL через некоторое время t (где t - положительное число) после успешного декодирования управляющей сигнализации.

Здесь описаны сценарии и способы, относящиеся к отслеживанию управляющей сигнализации нисходящей линии связи блоком WTRU, на который влияет активация и деактивация сот SCell.

Описанные способы также могут быть направлены на то, каким образом блок WTRU при приеме управляющей сигнализации для (де)активации по меньшей мере одной соты SCell может определить, какой формат (форматы) DCI он может отслеживать на данном канале PDCCH.

Когда блок WTRU активирует рассматриваемую соту SCell, блок WTRU может начать принимать канал PDSCH, и если рассматриваемая сота SCell сконфигурирована для приема канала PDCCH, начать отслеживать канал PDCCH для разрешений и назначений (например, скремблированных с помощью C-RNTI, SI-RNTI, P-RNTI, M-RNTI и т.п.) на ресурсах нисходящей линии связи, соответствующих рассматриваемой соте SCell.

Когда блок WTRU активирует рассматриваемую соту SCell, если блок WTRU сконфигурирован для планирования с перекрестными несущими для рассматриваемой соты SCell на канале PDCCH другой обслуживающей соты, и если блок WTRU имеет сконфигурированное специфическое для блока WTRU пространство поиска (SS) канала PDCCH для приема управляющей информации планирования, применимой к рассматриваемой соте SCell, и/или если блок WTRU принимает в команде активации идентифицирующую информацию пространства SS канала PDCCH (например, SSID канала PDCCH), соответствующую рассматриваемой соте SCell, то блок WTRU может начать декодировать канал PDCCH в пространстве поиска, соответствующем рассматриваемой соте SCell (например, соответствующем SSID) для форматов DCI, применимых к рассматриваемой линии связи SCell DL, и может начать декодировать форматы DCI, применимые к соответствующей/присоединенной линии связи SCell UL, если она сконфигурирована. Это может произойти, например, для случая, когда канал PDCCH, используемый для планирования с перекрестными несущими, соответствует линии связи PCell DL, или для случая, когда канал PDCCH, используемый для планирования с перекрестными несущими, неявно соответствует несущей DL CC, на которой управляющая сигнализация для активации была принята блоком WTRU.

В другом примере управляющая сигнализация может содержать показание в управляющей сигнализации, применимой к линии связи SCell DL, может ли блок WTRU декодировать канал PDCCH на линии связи SCell DL.

Когда блок WTRU деактивирует рассматриваемую соту SCell, блок WTRU может прекратить принимать канал PDSCH и прекратить отслеживать канал PDCCH (если он сконфигурирован для приема канала PDCCH) для разрешений и назначений (скремблированных посредством C-RNTI, SI-RNTI, P-RNTI, M-RNTI и т.п.) на ресурсах нисходящей линии связи, соответствующих рассматриваемой соте SCell. Блок WTRU на основе конфигурации измерений L3 и/или конфигурации индикатора CQI может

ASUS EX2019-p.244
Samsung v. ASUS
IPR2024-00614

продолжить выполнять соответствующие измерения и другие задачи обслуживания линии беспроводной связи, такие как периодическое отслеживание системной информации и/или поисковый вызов в заданных случаях для рассматриваемой соты SCell.

Когда блок WTRU деактивирует рассматриваемую соту SCell, если блок WTRU сконфигурирован для планирования с перекрестными несущими для рассматриваемой соты SCell, и если блок WTRU имеет сконфигурированное специфическое для блока WTRU пространство SS для управляющей информации планирования, применимой к рассматриваемой соте SCell, на канале PDCCH другой обслуживающей соты, блок WTRU может прекратить декодировать канал PDCCH в пространстве поиска канала PDCCH, соответствующем рассматриваемой соте SCell, (например, соответствующем SSID). Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может не отслеживать канал PDCCH деактивированной соты SCell и может не принимать назначения нисходящей линии связи или разрешения восходящая линия связи, соответствующие деактивированной соте SCell.

Когда блок WTRU активирует или деактивирует рассматриваемую соту SCell, блок WTRU также может изменять форматы DCI, которые он отслеживает на канале PDCCH. Если используется планирование с перекрестными несущими, блок WTRU может начать декодировать форматы DCI соответствующим образом (например, форматы DCI с индикатором CCIF) для множества назначений и разрешений, возможных для данного множества активных обслуживающих сот, запланированных данным каналом PDCCH. Если разные режимы передачи поддерживаются на разных активных сотах SCell, для которых блок WTRU отслеживает назначения и разрешения на данном канале PDCCH, блок WTRU может начать декодировать форматы DCI соответствующим образом, например, блок WTRU может декодировать все форматы для каждого поддерживаемого режима передачи для множества назначений и разрешений, возможных для данного множества активных сот SCell, поддерживающих каждый режим. Это может быть сделано в субкадре, в котором блок WTRU принял управляющую сигнализацию для активации/деактивации соты (сот) SCell после фиксированного количества времени (например, времени обработки блока WTRU, такого как 4 мс), из субкадра, в котором блок WTRU принял управляющую сигнализацию для активации/деактивации соты (сот) SCell, или после фиксированного количества времени от субкадра, в котором блок WTRU передал подтверждение управляющей сигнализации.

Когда блок WTRU активирует или деактивирует рассматриваемую соту SCell с целью декодирования управляющей информации нисходящей линии связи (например, канал PDCCH), блок WTRU определяет по меньшей мере одно из следующего для данного канала PDCCH: какой формат (форматы) DCI следует декодировать; каковы физические ресурсы (например, элементы канала управления); и сколько попыток декодирования следует выполнить. Упомянутое выше определение канала PDCCH может быть основано на том, поддерживает ли канал PDCCH несущей DL CC (например, линия связи PCell DL) планирование с перекрестными несущими по меньшей мере для одной другой несущей CC (например, одной или более сот SCell). Это также может быть основано на количестве активированных линий связи SCell UL и линий связи SCell DL и их соответствующих режимах передачи (то есть, какой формат DCI соответствует их режиму передачи), для которого канал PDCCH может переносить назначение нисходящей линии связи или разрешение восходящей линии связи. В качестве альтернативы, это может быть основано на том, использует ли формат DCI дополнительное поле CCIF или специальные кодовые точки. Например, если одна несущая CC поддерживает

ASUS EX2019-p.245
Samsung v. ASUS
IPR2024-00614

пространственное мультиплексирование, и другая несущая CC не поддерживает его на несущей DL CC, канала PDCCH которой поддерживает планирование для обеих несущих CC, блок WTRU может декодировать формат 1 и формат 2. Кроме того, когда блок WTRU находит максимальное возможное количество назначений нисходящей линии связи для данного формата DCI, он может прекратить декодировать этот формат.

Здесь описаны сценарии и способы, относящиеся к обработке текущих передач, на которые влияет активация и деактивация сот SCell.

В одном сценарии может быть затронута обработка текущих передач для нескольких сот SCell после деактивации. Деактивация соты SCell может произойти, пока все еще продолжается одна или более передач по восходящей линии связи на линии связи SCell UL. Это может прервать текущую передачу (передачи) и внести дополнительные задержки передачи посредством расчета на обнаружение отказа передачи и инициирования повторной передачи на более высоком уровне. Деактивация соты SCell может произойти, пока еще не завершилась одна или более передач нисходящей линии связи на линии связи SCell DL.

Описанные способы также направлены на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может определить после деактивации данного подмножества (то есть одной или более) сот SCell, может ли он сообщить верхним уровням, (например, RLC) об отказе HARQ для данного блока служебных данных (SDU) MAC (то есть блока PDU RLC), то есть выполнить локальный сигнал NACK от MAC к RLC для процесса HARQ восходящей линии связи данной соты SCell; и выполнить процедуру для инициирования повторной передачи блока PDU RLC, если нужно.

Когда блок WTRU деактивирует рассматриваемую соту SCell с целью обработки процессов запросов HARQ, которые еще не завершили свои (повторные) передачи после деактивации линии связи SCell UL, с использованием служб соответствующего объекта HARQ, например, для процессов HARQ, которые все еще имеют данные в своем соответствующем буфере HARQ, и которые либо приостановлены (например, последним был принят сигнал ACK HARQ на канале PHICH), либо имеют текущие повторные передачи (например, последним был принят сигнал NACK HARQ на канале PHICH), если процесс запросов HARQ имеет данные в своем буфере, блок WTRU может указать верхним уровням (например, RLC), что передача для соответствующего блока (блоков) SDU MAC потерпела неудачу (то есть для соответствующего блока (блоков) PDU RLC), и сбрасывает буфер HARQ.

Когда блок WTRU деактивирует рассматриваемую соту SCell с целью обработки состояния процесса HARQ для рассматриваемой соты SCell, блок WTRU может установить индикаторы новых данных (NDI) равными 0 для всей восходящей линии связи HARQ и/или сбросить буферы HARQ нисходящей линии связи (то есть следующая передача считается новой передачей).

Например, когда блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, деактивирует рассматриваемую соту SCell либо явно, например, когда блок WTRU принимает команду активации/деактивации, такую как управляющий элемент CE MAC активации/деактивации, деактивирующую рассматриваемую соту SCell, либо неявно, например, по истечении таймера деактивации, блок WTRU может сбросить все буферы HARQ, соответствующие рассматриваемой соте SCell.

Здесь описаны сценарии и способы, относящиеся к процедуре отчета запаса мощности посредством блока WTRU, на который влияет активация и деактивация сот SCell.

Управление мощностью блока WTRU может выполняться для каждой несущей UL

ASUS EX2019-p.246
Samsung v. ASUS
IPR2024-00614

CC, чтобы компенсировать медленно изменяющиеся условия канала. Некоторые из параметров управления мощностью, такие как управление мощностью передачи (TPC), измерения потерь по пути нисходящей линии связи и смещения могут быть обычными для более чем одной несущей UL CC.

В системе LTE R8/9 процедура отчета запаса мощности может использоваться для предоставления обслуживающему узлу eNB информации о разности между номинальной максимальной мощностью передачи блока WTRU для передач канала UL-SCH. Управление мощностью восходящей линии связи в системе LTE R8 может быть основано на объединенном механизме управления мощностью с обратной связью и без обратной связи. Компонент без обратной связи может быть основан на оценке без потерь по пути (PL), которая основана на измерениях блоком WTRU принятой мощности опорного сигнала (RSRP) на несущей DL CC, используемой в качестве опорного значения потерь по пути (PL), и известной мощности передачи опорного сигнала (RS) нисходящей линии связи, значение которой обычно широковещательно передается как системная информация. Оценка без потерь по пути может использоваться блоком WTRU для определения мощности передачи восходящей линии связи, и эта оценка основана на несущей DL CC, которая здесь упоминается как опорное значение PL. Компонент с обратной связью может быть основан на прямом управлении мощностью передачи блока WTRU посредством явных команд управления мощностью (TPC), передаваемых на канале PDCCH.

Для системы LTE R10, когда блок WTRU работает по меньшей мере с одной сотой SCell, линия связи SCell UL может быть сконфигурирована с помощью опорного значения PL с целью управления мощностью восходящей линии связи. Например, опорное значение PL линии связи SCell UL может являться конфигурацией линии связи PCell DL блока WTRU, или опорное значение PL линии связи SCell UL может быть сконфигурировано как часть конфигурации блока WTRU (например, одно на диапазон частот).

В системе LTE R10, когда для блока WTRU сконфигурирована по меньшей мере с одна сота SCell, отчет запаса мощности может состоять либо в значении запаса мощности для передачи, соответствующей каналу UL-SCH в данной обслуживающей соте, что здесь называется типом 1 PHR, либо в запасе мощности для передач на канале PUCCH и канале UL-SCH для соты PCell, что здесь называется типом 2 PHR. Определения типа 1 и типа 2 запаса мощности (PHR) показаны в таблице 1.

ASUS EX2019-p.247
Samsung v. ASUS
IPR2024-00614

Таблица 1

5.1.1.2 Запас мощности

Имеется два типа определенных отчетов запаса мощности пользовательского оборудования (UE). Запас мощности PH пользовательского оборудования, допустимый для субкадра i для обслуживающей соты c

Тип 1:

$$PH_c(i) = P_{CMAX,c} - \left\{ 10\log_{10}(M_{PUSCH_c}(i)) + P_{O\_PUSCH_c}(j) + \alpha_c(j) \cdot PL + \Delta_{TF,c}(i) + f_c(i) \right\} \text{ [dB]}$$

где, $P_{CMAX,c}$, $M_{PUSCH,c}(i)$, $P_{O\_PUSCH_c}(j)$, $\alpha_c(j)$., PL, $\Delta_{TF,c}(i)$ и $f_c(i)$ определены в секции 5.1.1.1.

Тип 2:

$$PH_c(i) = P_{CMAX,c} - 10\log_{10}\left(\begin{array}{l} 10^{\left(10\log_{10}(M_{PUSCH,c}(i)) + P_{O\_PUSCH,c}(j) + \alpha_c(j)\cdot PL + \Delta_{TF,c}(i) + f_c(i)\right)/10} \\ + \ 10^{\left(P_{0\_PUCCH} + PL + h\left(n_{CQI}, n_{HARQ}\right) + \Delta_{F\_PUCCH}(F) + g(i)\right)/10} \end{array} \right) \text{ [dB]}$$

где, $P_{CMAX,c}$, $M_{PUSCH,c}(i)$, $P_{O\_PUSCH_c}(j)$, $\alpha_c(j)$ $\Delta_{TF,c}(i)$ и $f_c(i)$ - параметры первичной соты, определенные в секции 5.1.1.1, и $P_{O\ PUCCH}$, PL, $h\left(n_{CQI}, n_{HARQ}\right)$, $\Delta_{F\_PUCCH}(F)$ и $g(i)$ определены в секции 5.1.2.1.

Запас мощности должен быть округлен до ближайшего значения в диапазоне [40;-23] дБ с шагом 1 дБ и доставлен физическим уровнем более высоким уровням.

В одном сценарии может быть затронут отчет запаса мощности для нескольких линий связи SCell UL при активации. Может быть необходимо обратиться к тому, каким образом блок WTRU уведомляет базовую станцию о запасе мощности блока WTRU для данной линии связи SCell UL при активации, чтобы гарантировать, что процесс планирования в базовой станции имеет подходящую и актуальную информацию от блока WTRU.

Описанные способы также направлены на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, при активации данного подмножества (то есть одной или более) сот SCell может определить, может ли он инициировать передачу PHR для данной несущей UL CC и выполнить процедуру для передачи PHR, если нужно.

Когда блок WTRU активирует рассматриваемую соту SCell с целью отчета запаса мощности блока WTRU для рассматриваемой соты SCell, блок WTRU может инициировать PHR, который соответствует запасу мощности для линии связи SCell UL, соответствующей рассматриваемой соте SCell, если принятая управляющая сигнализация включает в себя показание инициировать PHR. В качестве альтернативы, PHR может быть инициирован, если требование запаса мощности, применимое к линии связи SCell UL, соответствующей рассматриваемой соте SCell, отличается от требования от каких-либо других активных несущих UL CC (то есть допустимое значение запаса мощности для линии связи SCell UL не может быть выведено из допустимого значения от другой несущей UL CC). В качестве альтернативы PHR может быть инициирован, если изменяется количество активированных сот SCell. Другими словами, каждая активация рассматриваемой соты SCell может инициировать PHR, который может включать в себя по меньшей мере отчет для рассматриваемой соты SCell, и также может включать в себя PHR для всех сконфигурированных и/или активных обслуживающих сот.

Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell инициирует отчет запаса мощности для каждой активированной обслуживающей

ASUS EX2019-p.248
Samsung v. ASUS
IPR2024-00614

соты со сконфигурированными ресурсами восходящей линии связи, когда блок WTRU активирует по меньшей мере одну соту SCell со сконфигурированными ресурсами восходящей линии связи.

Если PHR был запущен и ожидает передачи, и если блок WTRU имеет ресурсы совместно используемого канала восходящей линии связи (UL-SCH) для новой передачи, блок WTRU может сделать отчет о допустимом значении PHR, применимом к линии связи SCell UL, соответствующей рассматриваемой соте SCell, с использованием одного из следующих способов. В одном способе PHR может быть сообщен в управляющем элементе PHR MAC в блоке пакетных данных (PDU) MAC, переданном в ресурсе канала UL-SCH линии связи SCell UL, соответствующей рассматриваемой соте SCell. В другом способе PHR может быть сообщен в управляющем элементе PHR MAC в блоке PDU MAC, переданном в ресурсе канала UL-SCH любой несущей UL CC, для которой вычисленный PHR может быть применим. В другом способе PHR может быть сообщен в управляющем элементе PHR MAC в блоке PDU MAC, переданном в ресурсе канала UL-SCH любой несущей UL CC, причем управляющий элемент PHR MAC может включать в себя поле CCIF, указывающее, для какой несущей (несущих) UL CC сообщаемое значение PHR может быть применим. Другими словами, когда для блока WTRU сконфигурирована по меньшей мере одна сота SCell, если PHR был инициирован, и PHR ожидает в субкадре, для которого блоку WTRU выделили ресурсы по меньшей мере для одной новой передачи в любой обслуживающей соте, блок WTRU может передать управляющий элемент PHR MAC, включающий в себя по меньшей мере значение запаса мощности для рассматриваемой соты SCell и возможно значение для соты PCell и всех других сот SCell, которые активированы в упомянутом субкадре.

Кроме того, когда значение PHR вычислено для несущей UL CC с использованием измерения и/или оценки на основе несущей DL CC, например, оценке без потерь по пути и/или измерениях RSRP, блок WTRU может рассматривать любую из несущих DL CC, соответствующих несущей UL CC, для которой вычислен PHR.

Описанные способы также определяют, следует ли включать ли управляющую информацию. В одном способе блок WTRU определяет для каждого транспортного блока (TB) в пределах данного подмножества транспортных блоков, следует ли ему включать заданную управляющую информацию (например, управляющий элемент MAC), на основе характеристик управляющего элемента MAC для передачи в данном интервале TTI.

Здесь описаны характеристики, которые могут относиться к управляющему элементу CE MAC. Одна характеристика может состоять в том, является ли передача управляющего элемента MAC специфической для данной несущей CC, в том числе в случае, когда транспортный блок для несущей CC разрешен для передачи в этом интервале TTI, и управляющий элемент MAC содержит: 1) информацию (например, PHR), которая применима к упомянутой несущей CC или к соответствующему подмножеству несущих CC; 2) информацию (например, C-RNTI), которая относится к текущей процедуре (например, к произвольному доступу), применимой к упомянутой несущей CC (например, к несущей CC соты PCell) или к соответствующему подмножеству несущих CC; или 3) информацию (например, BSR), которая, как ожидается, будет передаваться только в конкретной несущей CC (например, несущей CC соты PCell) или к соответствующему подмножеству несущих CC.

Другая характеристика может состоять в относительном приоритете управляющего элемента MAC. Например (аналогично MAC системы LTE R8), блок WTRU может принять во внимание следующий относительный приоритет в порядке убывания: 1)

ASUS EX2019-p.249
Samsung v. ASUS
IPR2024-00614

управляющий элемент MAC для C-RNTI или данных от канала UL-CCCH; 2) управляющий элемент MAC для отчета о статусе буфера (BSR), за исключением BSR для заполнения; 3) управляющий элемент MAC для PHR; 4) данные от любого логического канала (LCH), кроме данных от канала UL-CCCH; или 5) управляющий элемент MAC для BSR для заполнения. Например, отчет PHR о значении запаса мощности (для каналов PUCCH, PUSCH или для них обоих), вычисленный для данной несущей UL CC, может быть включен только в блок пакетных данных MAC (блок PDU) транспортного блока, который соответствует упомянутой несущей UL CC, если упомянутый транспортный блок разрешен для передачи в этом интервале TTI. В другом примере отчет BSR о состоянии буфера блока WTRU, заполненный после всех транспортных блоков этого интервала TTI, может быть включен в блок PDU MAC транспортного блока, который соответствует заданной несущей CC, только если упомянутый транспортный блок разрешен для передачи на упомянутой несущей CC (например, несущей CC соты PCell).

Другая характеристика может являться типом (в том числе форматом и информационным содержанием) управляющего элемента MAC. Блок WTRU может выбрать тип управляющего элемента MAC как функцию содержащейся информации. Блок WTRU может определить, содержит ли управляющий элемент MAC информацию, относящуюся к PCC (или соте PCell) или относящуюся к SCC (или соте SCell) конфигурации блока WTRU. Для примера управляющего элемента MAC для PHR блок WTRU может выбрать управляющий элемент PHR MAC type_2, если информационное содержание PHR применимо к PCC (или соте PCell) конфигурации блока WTRU. Иначе управляющий элемент MAC PHR type_1 выбирается для SCC (или соты SCell).

В другом случае блок WTRU может определить, содержит ли управляющий элемент MAC информацию, применимую к первой несущей CC (либо PCC, либо SCC), и управляющий элемент MAC передается на первой несущей CC. Например, когда блок WTRU передает в транспортном блоке второй несущей CC управляющий элемент MAC с информационным содержанием, применимым к первой несущей CC, блок WTRU выбирает формат управляющего элемента MAC, который включает в себя явную идентификацию первой несущей CC (или SCC/SCell или PCC/PCell). Другими словами, идентифицирующая информация первой несущей CC может быть опущена в формате включенного управляющего элемента MAC, если она включена в блок PDU MAC, переданный на первой несущей CC. В качестве альтернативы управляющий элемент MAC, который не включает в себя явную идентификацию несущей CC, может использоваться, если идентифицирующая информация первой несущей CC может быть получена на основе порядка управляющих элементов MAC в блоке PDU MAC. Это может быть применимо для случая, когда более чем один управляющий элемент MAC для одной и той же функции (но возможно разного типа) может быть включен в один и тот же блок PDU MAC. Например, блок WTRU может включать несколько управляющих элементов PHR MAC (один для каждой сконфигурированной и/или активированной обслуживающей соты) в один и тот же блок PDU MAC либо в порядке, в котором обслуживающие соты были сконфигурированы (например, посредством RRC), либо в соответствии с явным значением идентифицирующей информации обслуживающей соты (например, индексом соты), присвоенным каждой обслуживающей соте, либо что-либо подобное.

Другая характеристика может являться типом (типами) физического канала (например, канала PUSCH и/или PUCCH), для которого блок WTRU выполняет передачу (передачи) по восходящей линии связи в субкадре, в котором передан управляющий

ASUS EX2019-p.250
Samsung v. ASUS
IPR2024-00614

элемент MAC. Это могут быть только передачи в той же самой несущей CC (либо SCC/SCell, либо PCC/PCell), на которой передан управляющий элемент MAC. Например, для PHR для первой несущей CC (либо SCC/SCell, либо PCC/PCell) блок WTRU может выбрать управляющий элемент PHR MAC Type_1, если блок WTRU выполняет только передачу канала PUSCH на упомянутой первой несущей CC, или блок WTRU может выбрать управляющий элемент PHR MAC Type_2, если блок WTRU выполняет передачу канала PUCCH и передачу канала PUSCH на упомянутой первой несущей CC.

Другая характеристика может являться типом (типами) физического канала восходящей линии связи (например, канала PUSCH и/или PUCCH), который может использоваться блоком WTRU для передачи (передач) по восходящей линии связи на первой несущей CC, хотя такая передача не выполняется блоком WTRU в субкадре, в котором управляющий элемент MAC, применимый к первой несущей CC, передан в передаче по восходящей линии связи на второй несущей CC. В частности, если информационное содержание управляющего элемента PHR MAC может включать в себя "виртуальное" значение запаса мощности для первой несущей CC, блок WTRU может выбрать управляющий элемент PHR MAC Type_1 для несущей CC(x), если первая несущая CC не сконфигурирована для передачи канала PUCCH. Информационное содержание может включать в себя значение запаса мощности, выведенное на основе "виртуальной" передачи канала PUSCH. Иначе блок WTRU может выбрать управляющий элемент PHR MAC Type_2 для несущей CC, причем информационное содержание может включать в себя значение запаса мощности, выведенное на основе "виртуальной" передачи канала PUSCH и "виртуального" значения канала PUCCH. "Виртуальным" значением высоты мощности для части, относящейся к передаче канала PUSCH, называется значение, выведенное блоком WTRU для первой несущей CC, хотя передача канала PUSCH не выполняется, первая несущая CC в субкадре использована для передачи соответствующего PHR на второй несущей CC. Такое значение, например, может быть выведено из мощности, которая использовалась бы блоком WTRU для заданной схемы модуляции и кодирования (MCS) и заданного количества M ресурсных блоков (RB), которые могут быть получены, например, либо из фиксированного (например, определенного или сконфигурированного) значения, также известного узлу eNB, либо из разрешения, соответствующего предыдущей передаче на упомянутой первой несущей CC. Аналогичным образом, для части, относящейся к передаче канала PUCCH (если это применимо для первой несущей CC), так называется значение, выведенное на основе передачи с использованием, например, предопределенного формата, такого как формат 1a. Во всех упомянутых выше случаях передача канала PUSCH может использоваться независимо от того, включает ли передача управляющую информацию восходящей линии связи (UCI) и/или данные.

Когда блок WTRU определяет, что он должен включить управляющую информацию в транспортный блок, он может позже принять во внимание размер управляющей информации при обслуживании данных из каналов LCH для подмножества транспортных блоков.

Когда блок WTRU определяет, должна ли быть включена управляющая информация, блок WTRU также может выполнить упомянутое выше для соты PCell и, возможно, также для каждой сконфигурированной соты SCell (и, возможно, также активированной). Например, если для отчета PHR блок WTRU может сообщить "виртуальные" значения запаса мощности для сконфигурированных и активированных обслуживающих сот, когда PHR инициируется, блок WTRU может определить, какие обслуживающие соты сконфигурированы и активированы, и включить управляющий элемент PHR MAC для

ASUS EX2019-p.251
Samsung v. ASUS
IPR2024-00614

каждой из этих обслуживающих сот по меньшей мере в один транспортный блок.

Здесь описаны сценарии и способы, относящиеся к выравниванию по времени восходящей линии связи блока WTRU, на который влияет активация и деактивация сот SCell, для блока WTRU, для которого сконфигурирована по меньшей мере одна сота SCell.

Для блока WTRU может быть сконфигурирована по меньшей мере одна линия связи SCell UL, то есть одно или более множеств обслуживающих сот со сконфигурированными ресурсами восходящей линии связи, для которых опережение по времени (TA) может отличаться от опережения по времени линии связи PCell UL. Например, это может произойти, когда каждая из двух несущих UL CC имеет одну или более из следующих характеристик: разные зоны охвата (например, на основе диапазона несущей CC); разные характеристики распространения (например, на основе потерь на пути); или разные или множественные точки происхождения (например, разные узды eNB и/или вследствие избирательных по частоте приемников, сценариев развертывания COMP, удаленных радиочастотных головок и т.п.).

В одном сценарии опережение по времени может отличаться между разными линиями связи SCell UL, и это может воздействовать на работу блока WTRU на нескольких обслуживающих сотах. Это может быть справедливо, когда обслуживающие соты не находятся в одном и том же диапазоне частот, или для некоторых сценариев развертывания (например, использующих повторители или удаленные радиочастотные головки от одной и то же базовой станции). При условии, что блок WTRU соединен с сотой PCell, и что дополнительные соты SCell могут быть сконфигурированы и (де) активированы по необходимости, когда таймер TAT, применимый к обслуживающей соте, которая менее используется (и иногда неактивна), не работает, при (ре)активации следует позаботиться о том, чтобы гарантировать, что блок WTRU не инициирует передачи восходящей линии связи, прежде чем будет иметь надлежащее выравнивание времени, или прежде чем будет иметь актуальную системную информацию (SI). Также может быть необходимо обратиться к тому, каким образом обрабатывать другие выделенные ресурсы восходящей/нисходящей линии связи, сконфигурированные для блока WTRU.

Описанные способы также направлены на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, при активацию данного подмножества (то есть, одной или более) рассматриваемых обслуживающих сот может определить, может ли он считать, что он выровнен по времени, то есть, может ли он использовать ресурсы восходящей линии связи в рассматриваемой соте SCell, не создавая ненужные помехи для передач других блоков WTRU в этой соте SCell; выполнить процедуру (процедуры) для достижения выравнивания по времени восходящей линии связи по меньшей мере для одной из сот SCell в подмножестве; и/или поддерживать выравнивание по времени по меньшей мере для одной из сот SCell в подмножестве.

Только в иллюстративных целях описанные здесь способы могут быть применимы к блоку WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, причем сота SCell имеет сконфигурированные ресурсы восходящей линии связи, которые могут быть соединены с базовой станцией, и причем сота SCell может быть первоначально активирована базовой станцией или когда время таймера TAT, соответствующего соте SCell, короче периода, в течение которого рассматриваемая сота SCell была неактивна (например, когда таймер TAT мог быть не перезапущен и/или мог истечь). Разные несущие UL CC могут иметь разные требования опережения по времени, например, основанные на, частоте или физическом идентификаторе соты

ASUS EX2019-p.252
Samsung v. ASUS
IPR2024-00614

для соты на соответствующей несущей DL CC. Блок WTRU может иметь соединение с сотой PCell базовой станции (например, RRC_CONNECTED в системе LTE).

Когда блок WTRU активирует рассматриваемую соту SCell с целью поддержания выравнивания по времени восходящей линии связи, блок WTRU может выполнить произвольный доступ с использованием ресурсов канала RACH, соответствующего рассматриваемой линии связи SCell UL, при любом из следующих условий: если принятая управляющая сигнализация включает в себя показание инициировать произвольный доступ; если опережение по времени, применимое к ресурсам линии связи SCell UL, соответствующей рассматриваемой соте SCell, не допустимо (например, соответствующий таймер TAT не работает); или если управляющая сигнализация принята на канале PDCCH и скремблирована с использованием заданного идентификатора RNTI (например, A-RNTI_0).

В одном примере управляющая сигнализация может содержать показание (явное, неявное или оба) того, может ли блок WTRU выполнить процедуру произвольного доступа, посредством по меньшей мере одного из следующих способов: использование ресурсов, соответствующих соте SCell, обозначенной полем CCIF; использование ресурсов произвольного доступа (преамбула произвольного доступа, маска PRACH), явно обозначенных в управляющей сигнализации для активации/деактивации; и/или если таймер TAT, соответствующий соте SCell (или ее группе), не работает. Например, блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, может инициировать процедуру произвольного доступа на ресурсах произвольного доступа рассматриваемой соты SCell при активации рассматриваемой соты SCell, в частности, если таймер TAT, соответствующий рассматриваемой соте SCell, не работает. В качестве альтернативы блок WTRU может инициировать процедуру произвольного доступа на ресурсах произвольного доступа другой обслуживающей соты, которая совместно использует то же самое требование выравнивания по времени, как и рассматриваемая сота SCell.

Когда блок WTRU активирует рассматриваемую соту SCell с целью применения команды опережения по времени (TAC), принятой после активации рассматриваемой соты SCell, блок WTRU может применить принятую команду TAC к опережению по времени несущей UL CC, соответствующей несущей DL CC, на которой команда TAC был принята, или к опережению по времени всех несущих UL CC, имеющих те же самые требования опережения по времени, как и несущая UL CC, соответствующая несущей DL CC, на которой была принята команда TAC.

В другом примере управляющая сигнализация может содержать команду выравнивания по времени (TAC), которую блок WTRU применяет по меньшей мере к одному объекту из множества, состоящего из: несущей UL CC, идентифицированной явно в управляющей сигнализации, например, с использованием поля CCIF; линии связи SCell UL, соответствующей рассматриваемой соте SCell, которая активируется; или группы несущих UL CC, имеющих одинаковые требования опережения по времени. Заданная группа может быть идентифицирована на основе несущей UL CC, идентифицированной как описано выше. Например, блок WTRU может применить команду TAC, принятую на канале PDSCH рассматриваемой соты SCell к опережению по времени упомянутой рассматриваемой соты SCell и, возможно, к опережению по времени другой активированной соты SCell, которая совместно использует то же самое требование выравнивания по времени, как и рассматриваемая сота SCell.

Когда блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, деактивирует рассматриваемую соту SCell с целью обработки любой процедуры

ASUS EX2019-p.253
Samsung v. ASUS
IPR2024-00614

произвольного доступа, работающей в рассматриваемой соте SCell, блок WTRU может остановить любую текущую процедуру канала RACH для рассматриваемой соты SCell. В качестве альтернативы блок WTRU может отбросить любую явно сообщенную преамбулу (например, ra-PreambleIndex) и ресурс канала PRACH (например, ra-PRACH-MaskIndex), если таковые имеются, и если это применимо к рассматриваемой соте SCell. В качестве альтернативы блок WTRU может также высвободить временный идентификатор C-RNTI, если таковой имеется, и если это применимо к рассматриваемой соте SCell.

Здесь описаны иллюстративные способы обработки реконфигурации MAC. Для линии связи SCell DL или линии связи SCell UL с целью обработки поведения MAC блока WTRU для (ре)конфигурации RRC, включающей в себя удаление (высвобождение) по меньшей мере одной соты SCell, блок WTRU может: остановитесь текущую процедуру RACH, если таковая имеется, для удаленной компонентной несущей; отбросить явно сообщенную преамбулу (например, ra-PreambleIndex) и ресурс PRACH (например, ra-PRACH-MaskIndex), если таковые имеются, и если это применимо к удаленной соте SCell; и/или высвободить временный идентификатор C-RNTI, если таковой имеется, и если это применимо к рассматриваемой соте SCell.

(Ре)конфигурация RRC дополнительных несущих CC может неявно инициировать упомянутые выше процедуры произвольного доступа с целью достижения опережения по времени в обслуживающих сотах, для которых блок WTRU не имеет допустимого опережения по времени. Это может применяться к начальной конфигурации и/или к любой реконфигурации обслуживающих сот. (Ре)конфигурация RRC дополнительной соты (сот) SCell также может неявно инициировать PHR. Это может применяться к начальной конфигурации и/или к любой реконфигурации обслуживающей соты (сот).

Описаны иллюстративные способы и/или действия при достижении максимального количества попыток передачи для запросов планирования (SR) на канале PUCCH, которые могут влиять на конфигурацию, активацию и деактивацию сот SCell для блока WTRU, для которого сконфигурирована по меньшей мере одна сота SCell.

С целью обработки блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, когда количество (SR_COUNTER) попыток передачи для запросов планирования на сконфигурированном и допустимом ресурсе канала PUCCH для запросов планирования достигает (или превышает) максимальное значение, сконфигурированное сетью,(например, dsr-TransMax), блок WTRU может деактивировать все сконфигурированные и активные соты SCell, если таковые имеются. Это может включать в себя деактивацию конфигурации CQI/PMI/RI для сот SCell. В качестве альтернативы блок WTRU может инициировать произвольный доступ и отменить все ожидающие запросы планирования, которые могут включать в себя инициирование произвольного доступа на ресурсах восходящей линии связи сконфигурированной соты SCell. В качестве альтернативы блок WTRU может очистить любые сконфигурированные назначения нисходящей линии связи и разрешения восходящей линии связи. В качестве альтернативы блок WTRU может высвободить конфигурацию для работы с несколькими несущими, включающую в себя по меньшей мере один элемент множества, состоящего из: конфигурации соты (сот) SCell (возможно, только конфигурации соты SCell восходящей линии связи); конфигурации канала PUCCH для передач сигнала ACK/NACK HARQ; конфигурации канала PUCCH для передач CQI/PMI/RI; или конфигурации канала PUCCH для передач запросов планирования. Действительно, упомянутые выше примеры могут привести к неявной деактивации или высвобождению всех сот SCell вследствие достижения максимального количества запросов планирования.

ASUS EX2019-p.254
Samsung v. ASUS
IPR2024-00614

В одном иллюстративном способе блок WTRU может высвободить всю конфигурацию нескольких несущих (то есть сот SCell, ресурсов канала PUCCH для сигнала ACK/NACK HARQ, CQI/PMI/RI, запросов планирования), а также любые сконфигурированные назначения или разрешения и вернуться к работе с одной стандарта R8 или R9 в обслуживающей соте, соответствующей соте PCell конфигурации блока WTRU с несколькими несущими. Блок WTRU может затем инициировать произвольный доступ в упомянутой обслуживающей соте (то есть, соте PCell). Таблица 2 обеспечивает вариант осуществления этого иллюстративного способа.

Таблица 2

Если инициирован запрос SR и нет другого ожидающего запроса SR, пользовательское оборудование может установить SR_COUNTER равным 0. Пока один запрос SR находится в ожидании, пользовательское оборудование может для каждого интервала TTI: если не доступны ресурсы канала UL-SCH для передачи в этом интервале TTI: если пользовательское оборудование не имеет допустимого ресурса канала PUCCH для запроса SR, сконфигурированного в каком-либо интервале TTI: инициировать процедуру произвольного доступа (см. подпункт 5.1) и отменить все ожидающие запросы SR; иначе, если пользовательское оборудование имеет допустимый ресурс канала PUCCH для запроса SR, сконфигурированного для этого интервала TTI, и если этот интервал TTI не является частью промежутка для измерений, и если таймер sr-ProhibitTimer не работает: если SR_COUNTER<dsr-TransMax: увеличить SR_COUNTER на 1; дать команду физическому уровню сигнализировать запрос SR на канале PUCCH; запустить таймер sr-ProhibitTimer. иначе: уведомить RRC для высвобождения PUCCH/SRS и конфигурации для всех сот SCell, если таковые имеются; очистить любые сконфигурированные назначения нисходящей линии связи и разрешения восходящей линии связи; инициировать процедуру произвольного доступа (см. подпункт 5.1) и отмените все ожидающие запросы SR.

В другом примере блок WTRU может деактивировать любые активированные соты SCell (линии связи SCell DL и линии связи SCell UL) и высвободить конфигурацию для ресурсов канала PUCCH, относящихся к работе с несколькими несущими (то есть ресурсов канала PUCCH для ACK/NACK HARQ, CQI/PMI/RI, SR), а также любые сконфигурированные назначения или разрешения и выполнить произвольный доступ посредством выбора доступного ресурса на любой несущей UL CC своей конфигурации с несколькими несущими. Он может выбрать линию связи PCell UL. Для линии (линий) связи SCell UL, если не определено явное состояние деактивации, блок WTRU может проигнорировать любые принятые разрешения восходящей линии связи по меньшей мере до тех пор, пока он не принимает управляющую сигнализацию для реконфигурации работы с несколькими несущими. Таблица 3 обеспечивает вариант осуществления иллюстративного способа.

Таблица 3

Если инициирован запрос SR и нет другого ожидающего запроса SR, пользовательское оборудование может установить SR_COUNTER равным 0. Пока один запрос SR находится в ожидании, пользовательское оборудование может для каждого интервала TTI: если не доступны ресурсы канала UL-SCH для передачи в этом интервале TTI: если пользовательское оборудование не имеет допустимого ресурса канала PUCCH для запроса SR, сконфигурированного в каком-либо интервале TTI: инициировать процедуру произвольного

доступа (см. подпункт 5.1) и отменить все ожидающие запросы SR; иначе, если пользовательское оборудование имеет допустимый ресурс канала PUCCH для запроса SR, сконфигурированного для этого интервала TTI, и если этот интервал TTI не является частью промежутка для измерений, и если таймер sr-ProhibitTimer не работает: если SR_COUNTER < dsr-TransMax: увеличить SR_COUNTER на 1; дать команду физическому уровню сигнализировать запрос SR на канале PUCCH; запустить таймер sr-ProhibitTimer. иначе: уведомить RRC для высвобождения PUCCH/SRS; деактивировать все активированные соты SCell, если таковые имеются; [игнорировать любые принятые разрешения восходящей линии связи для всех сконфигурированных SCC восходящей линии связи, если таковые имеются, пока RRC не реконфигурировал пользовательское оборудование для работы с несколькими несущими] очистить любые сконфигурированные назначения нисходящей линии связи и разрешения восходящей линии связи; инициировать процедуру произвольного доступа (см. подпункт 5.1) и отмените все ожидающие запросы SR.

ASUS EX2019-p.255
Samsung v. ASUS
IPR2024-00614

Здесь описаны сценарии и способы, относящиеся к процедурам отслеживания линии беспроводной связи, на которые влияет активация и деактивация сот SCell, для блока WTRU, для которого сконфигурирована по меньшей мере одна сота SCell.

В одном сценарии базовая станция может сконфигурировать для блока WTRU по меньшей мере одну соту SCell в дополнение к соте PCell. Если качество линии беспроводной связи некоторых или всех обслуживающих сот ухудшается и перестает соответствовать некоторым критериям качества, может быть необходим механизм для увеличения возможности блока WTRU либо восстановить, либо улучшить связь с системой.

Описанные способы также направлены на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, при обнаружении проблем физического уровня и/или обнаружения ухудшения качества линии беспроводной связи ниже определенного порога может неявно активировать некоторые или все сконфигурированные соты SCell и/или отключить алгоритмы экономии мощности (например, прерывистый прием (DRX)) для этих сот SCell.

Для линии связи SCell DL с целью активации линии связи SCell DL блок WTRU может отслеживать и/или обнаруживать проблемы физического уровня, такие как плохой прием сигналов синхронизации, например, на основе возникновения некоторого количества показателей рассинхронизации от физического уровня (например, N310, значение, которое может быть сконфигурировано базовой станцией) или отказа завершения некоторого количества процедур произвольного доступа (где значение может быть сконфигурировано базовой станцией). Блок WTRU также может отслеживать и обнаруживать качество линии беспроводной связи, ухудшающееся ниже определенного порога. Например, измерения (например, индикатора CQI) могут уменьшиться ниже определенного порога (например, значения, сконфигурированного базовой станцией). Действия отслеживания и обнаружения могут быть выполнены для: соты PCell; сконфигурированной соты (сот) SCell, является ли сота SCell активной/неактивной; или сконфигурированных обслуживающих сот, в том числе соты PCell, и является ли сота SCell активной/неактивной.

Блок WTRU при обнаружении проблемы физического уровня или ухудшения линии беспроводной связи может активировать первую линию связи SCell DL и/или непрерывно отслеживать управляющую сигнализацию (например, независимо от функций экономии мощности, таких как DRX). Эти действия могут быть выполнены для: соты PCell; сконфигурированной соты (сот) SCell, является ли сота SCell активной/неактивной; или сконфигурированных обслуживающих сот, в том числе соты PCell, и является ли сота SCell активной/неактивной. Эти действия могут быть выполнены по меньшей мере, пока блок WTRU не принимает от базовой станции явную деактивацию для соты (сот) SCell, причем явная деактивация может быть включена в сообщение реконфигурации беспроводной связи с помощью информационного элемента управления мобильностью или без него (то есть команды эстафетной передачи или после истечения заданного количества времени (например, таймер T310)). После истечения заданного количества времени (например, таймер T310) блок WTRU может инициировать любое изменение соты PCell (например, эстафетную передачу, повторное установление соединения или процедуру реконфигурации) в пределах множества сконфигурированных сот SCell или процедуру повторного установления соединения с другой сотой.

Блок WTRU может деактивировать рассматриваемую соту SCell, если таймер отслеживания линии беспроводной связи, такой как таймер T310, работает, и если блок WTRU обнаруживает условия, которые приводят к обнаружению проблем физического

ASUS EX2019-p.256
Samsung v. ASUS
IPR2024-00614

уровня, качество линии беспроводной связи не повышается выше определенного порога, и/или рассматриваемая сота SCell была в деактивированном состоянии до запуска таймера T310 (то есть до обнаружения блоком WTRU проблем физического уровня).

Когда блок WTRU деактивирует рассматриваемую соту SCell, блок WTRU может прекратить принимать канал PDSCH и прекратить отслеживать канал PDCCH (если он сконфигурирован для приема канала PDCCH) для разрешений и назначений (скремблированных с помощью индикаторов C-RNTI, SI-RNTI, P-RNTI, M-RNTI и т.п.) на ресурсах нисходящей линии связи, соответствующих рассматриваемой соте SCell. Блок WTRU на основе конфигурации измерений L3 и/или конфигурации индикатора CQI может продолжать выполнять соответствующие измерения и другие задачи обслуживания линии беспроводной связи, такие как периодический контроль системной информации и/или поисковый вызов в заданных случаях для рассматриваемой соты SCell.

Здесь описаны сценарии и способы, относящиеся к сбору и обслуживанию системной информации (SI) блоком WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, на которую влияет активация и деактивация сот SCell.

В другом сценарии, когда сота SCell не активна, блоку WTRU может не потребоваться периодически отслеживать системную информацию, и может не быть желательным, чтобы блок WTRU отслеживал уведомления системной информации в деактивированной соте SCell в некотором заданном случае. Может быть необходимо обратиться к тому, каким образом блок WTRU гарантирует, что системная информация является актуальной при активации соты SCell, чтобы гарантировать, что блок WTRU может получить доступ к дополнительным ресурсам соты SCell.

Другой аспект описанных способов направлен на то, каким образом блок WTRU при активации данного подмножества (то есть одной или более) сот SCell с агрегацией несущих может определить, должен ли он получать/обновлять системную информацию, имеющую отношение по меньшей мере к одной соте SCell из подмножества; и выполняет процедуру (процедуры) для получения/обновления системной информации.

Когда блок WTRU активирует рассматриваемую соту SCell с целью поддержания действительной системной информации для рассматриваемой соты SCell, блок WTRU может получить системную информацию для рассматриваемой соты SCell с использованием известных процедур для сбора системной информации, когда происходит по меньшей мере одно из следующих условий: если блок WTRU не имеет сохраненной системной информации для рассматриваемой соты SCell; если принятая управляющая сигнализация включает показание получить системную информацию; если управляющая сигнализация включает тег значения, указывающий, что сохраненная системная информация больше не действительна; или если управляющая сигнализация принята на канале PDCCH и скремблирована с использованием заданного идентификатора RNTI (например, A-RNTI_1).

В другом примере управляющая сигнализация может содержать показание относительно того, изменилась ли системная информация, имеющая отношение ко второй несущей CC, например, на основе тега значения системной информации, например, 5-битового или простого двоичного показателя. Тег значения может представлять часть системной информации, имеющую отношение к второй несущей CC, например, часть, которая может быть обязана быть допустимой для правильного функционирования на этой второй несущей CC как части беспроводной системы с несколькими несущими. В этом случае такой тег значения может быть обеспечен в системной информации второй несущей CC в дополнение к существующему тегу

ASUS EX2019-p.257
Samsung v. ASUS
IPR2024-00614

значения, представляющему всю системную информацию. Аналогичным образом, двоичный показатель может представлять изменение части системной информации.

Кроме того, когда блок WTRU может повторно получить системную информацию для соты PCell, изменение в части системной информации может воздействовать на работу в сотах SCell (если они сконфигурированы и активированы). Например, в предположении, что блок WTRU отправляет управляющую информацию восходящей линии связи (например, ACK/NACK HARQ, индикатор CQI и т.п.) на ресурсах PUCCH одной несущей UL CC (например, линия связи PCell UL), изменение в конфигурации канала PUCCH может воздействовать на передачу управляющей сигнализации.

Блок WTRU также может деактивировать соту SCell, в то время как блок WTRU повторно получает системную информацию вследствие изменения в системной информации. Например, если системная информация принадлежит только соте PCell, или если системная информация широковещательно передается только на соте PCell. В другом примере изменение системной информации может быть связано с данным элементом в конфигурации (например, конфигурации для канал PUCCH соответствующей несущей UL CC).

Здесь описаны сценарии и способы, относящиеся к распределению ресурсов для информации обратной связи HARQ восходящей линии связи для передач нисходящей линии связи посредством блока WTRU, на который влияет активация и деактивация сот SCell.

Блок WTRU может передавать информацию обратной связи HARQ для передач канала PDSCH, принятых в любой сконфигурированной и активной несущей DL CC на ресурсах одной несущей UL CC, (например, на канале PUCCH соты PCell). Применимое распределение ресурсов может быть определено посредством первого элемента канала управления (CCE) канала PDCCH для соответствующей передачи канала PDSCH. Блок WTRU может передать CQI/PMI/RI для любой сконфигурированной несущей CC на ресурсах одной несущей UL CC (например, на канале PUCCH соты PCell). Применимый ресурс может быть сконфигурирован посредством сигнализации RRC.

В другом сценарии режим передачи для сигнализации канала PUCCH в несущей UL CC (например, линия связи PCell UL) переносит фиксированное количество информации (то есть формат) при условии, что фиксированный бюджет линии связи и формат для целей декодирования может быть известен приемнику. Блок WTRU может быть выполненным с возможностью передавать сигнал ACK/NACK HARQ обратной связи для параллельных передач канала PDSCH в разных обслуживающих сотах и/или информацию CQI/PMI/RI обратной связи для нескольких обслуживающих сот. Способ, посредством которого блок WTRU передает управляющую информацию на канале PUCCH, может зависеть от количества сконфигурированных сот SCell/каналов PDSCH и/или количества обслуживающих сот, для которых блок WTRU может сообщить информацию CQI/PMI/RI. Хотя для базовой станции может быть возможно управлять действием восходящей линии связи блока WTRU на канале PUCCH способом, который предсказуемым образом заставляет происходить переключение между режимом передачи канала PUCCH блока WTRU (например, посредством внесения задержки или периода молчания для информации обратной связи HARQ на канале PUCCH между реконфигурацией/активацией/деактивацией сот SCell), может быть желательно для блока WTRU следовать четкому поведению, чтобы избежать любой возможной неточности относительно того, какой формат следует использовать для передачи канала PUCCH в любом данном субкадре. Потребность в четкой точке синхронизации может быть особенно важной для информации CQI/PMI/RI и ACK/NACK HARQ.

ASUS EX2019-p.258
Samsung v. ASUS
IPR2024-00614

Другой аспект описанных способов направлен на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, при обнаружении изменения количества сконфигурированных (в качестве альтернативы активных) линий связи SCell DL (то есть, каналов PDSCH), для которых он может сообщать информацию обратной связи HARQ (например, на канале PUCCH) и/или другую управляющую информацию восходящей линии связи, такую как информация CQI/PMI/RI, на одной данной несущей UL CC, может неявно изменить режим передачи (формат) для управляющей сигнализации восходящей линии связи либо в субкадре, от которого применима реконфигурация, либо в субкадре, в котором изменилось количество линий связи SCell DL, либо спустя количество времени смещения от них (например, спустя время обработки 3 мс).

В другом примере управляющая сигнализация может содержать конфигурацию блока WTRU или в качестве альтернативы индекс для упомянутой конфигурации. Это может включать в себя по меньшей мере один из следующих элементов информации. Информация может представлять собой конфигурацию канала PUCCH или индекс для нее по меньшей мере для одного из ресурсов (например, формат и/или расположение и/или кодирование) для ACK/NACK HARQ и/или ресурсов для информации CQI/PMI/RI. Информация также может представлять собой конфигурацию сигнала SRS или индекс для него. Информация также может представлять собой конфигурацию SPS или индекс для нее либо для несущей UL CC, либо для несущей DL CC, либо для обоих. Информация также может представлять собой конфигурацию беспроводных ресурсов, такую как режим передачи несущей CC. Для любой упомянутой выше информации конфигурации информация конфигурации может представлять собой индекс для элемента во множестве ранее сконфигурированных ресурсов восходящей/нисходящей линии связи.

Информация также может представлять собой конфигурацию, которая может быть применима по меньшей мере к одному элементу множества, состоящего из: линии связи SCell UL, соответствующей активируемой рассматриваемой соте SCell; линии связи PCell UL, соответствующей соте PCell; или несущей UL CC или несущей DL CC другой обслуживающей соты, явно указанной в управляющей сигнализации.

В другом примере управляющая сигнализация может содержать показание относительно того, может ли блок WTRU использовать ресурсы канала PUCCH для информации обратной связи HARQ в несущей UL CC, соответствующей по меньшей мере одному элементу множества, состоящего из: несущей UL CC, соответствующей обслуживающей соте, в которой была принята управляющая сигнализация; несущей UL CC, соответствующей соте PCell; несущей UL CC, сконфигурированной (например, RRC) для отчетов информации обратной связи HARQ для передач канала PDSCH на нескольких несущих DL CC; или множество ресурсов канала PUCCH (например, формат, расположения и/или кодирование канала), сконфигурированных (например, RRC), например, как индекс для элемента во множестве сконфигурированных ресурсов. Например, блок WTRU может принять индекс для множества индексов с целью распределения ресурсов информации обратной связи HARQ.

С целью выбора, какой режим передачи блок WTRU может использовать для передачи управляющей сигнализации либо на канале PUCCH, либо на канале PUSCH на несущей UL CC (например, линия связи PCell UL), блок WTRU может сделать следующее. Блок WTRU определяет, сконфигурирован ли блок WTRU для отчета управляющей сигнализации таким образом, чтобы управляющая информация для одной или более несущих DL CC могла быть включена в один и тот же формат передачи. Управляющая

ASUS EX2019-p.259
Samsung v. ASUS
IPR2024-00614

сигнализация может представлять собой управляющую информацию для нескольких обслуживающих сот и может быть агрегирована в одинаковом формате передачи, управляющая сигнализация может представлять собой информацию обратной связью HARQ для передачи канала PDSCH, или управляющая сигнализация может представлять собой информацию CQI/PMI/RI обратной связи. Если блок WTRU активирует или деактивирует по меньшей мере одну линию связи SCell DL, и эта активация/деактивация приводит к другому количеству обслуживающих сот, для которых блок WTRU сообщает управляющую сигнализацию в одинаковом формате передачи, блок WTRU может изменить режим передачи для любой комбинации информации CQI, PMI и/или RI при отчете на канале PUSCH и/или на канале PUCCH (если такие ресурсы сконфигурированы для блока WTRU) в субкадре, в котором блок WTRU принял управляющую сигнализацию для активации/деактивации соты (сот) SCell, или спустя фиксированное количество времени (например, время обработки блока WTRU, такое как 4 мс) от субкадра, в котором блок WTRU принял управляющую сигнализацию для активации/деактивации соты (сот) SCell; или спустя фиксированное количество времени от субкадра, в котором блок WTRU передал подтверждение управляющей сигнализации.

Здесь описаны сценарии и способы, относящиеся к планированию с перекрестными несущими, на которое влияет активация и деактивация сот SCell.

Когда блок WTRU может быть запланирован (либо разрешения восходящей линии связи, либо назначения нисходящей линии связи) на нескольких обслуживающих сотах, блок WTRU может либо быть выполнен с возможностью отслеживать канал PDCCH в каждой из сконфигурированных несущих DL CC, либо быть выполнен с возможностью планирования с перекрестными несущими.

Другой аспект описанных способов направлен на то, каким образом блок WTRU, для которого сконфигурирована по меньшей мере одна сота SCell, при активации соты SCell может определить, может ли планирование с перекрестными несущими использоваться для этой соты SCell и/или может ли он активировать дополнительные соты SCell с этой целью.

В другом примере управляющая сигнализация может содержать показание в управляющей сигнализации, применимой к несущей CC, может ли блок WTRU декодировать канал PDCCH на несущей DL CC, используемой для планирования с перекрестными несущими беспроводных ресурсов для упомянутой несущей CC. Это может включать в себя идентифицирующую информацию несущей DL CC, используемой для планирования с перекрестными несущими упомянутой несущей CC.

В другом примере управляющая сигнализация может содержать показание в управляющей сигнализации, применимой к несущей DL CC, применима ли сигнализация с перекрестными несущими для канала PDCCH несущей DL CC. Это может включать в себя явное показание и/или идентифицирующую информацию для того, в каком специфическом для блока WTRU пространстве (пространствах) поиска блок WTRU может декодировать канал PDCCH для назначений нисходящей линии связи ("идентификатор SSID канала PDCCH"). В частности, это может включать в себя индекс для элемента специфической для блока WTRU конфигурации пространства поиска и/или параметр для получения начального расположения специфического для блока WTRU пространства поиска, например, количество элементов CCE для пространства поиска или виртуальный идентификатор для использования вместо идентификатора блока WTRU, используемого для получения кандидата канала PDCCH в пространстве поиска.

В другом примере управляющая сигнализация может содержать показание в

ASUS EX2019-p.260
Samsung v. ASUS
IPR2024-00614

управляющей сигнализации, применимой к несущей UL CC, применима ли сигнализация с перекрестными несущими для канала PUSCH несущей UL CC. Это может включать в себя явное показание и/или идентифицирующую информацию для того, какая несущая (несущие) DL CC может обеспечить управляющую информацию планирования (то есть канал PDCCH) для несущей CC. Это может включать в себя явное показание и/или идентифицирующую информацию для того, в каком специфичном для блока WTRU пространстве поиска блок WTRU может декодировать канал PDCCH для разрешений восходящей линии связи ("идентификатор SSID канала PDCCH"). В частности, это может включать в себя индекс для элемента специфической для блока WTRU конфигурации пространства поиска и/или параметр для получения начального расположения специфического для блока WTRU пространства поиска, например, количество элементов CCE для пространства поиска или виртуальный идентификатор для использования вместо идентификатора блока WTRU, используемого для получения кандидата канала PDCCH в пространстве поиска.

В другом примере блок WTRU может принять в управляющей сигнализации RRC, которая конфигурирует рассматриваемую соту SCell и/или которая конфигурирует блок WTRU для планирования с перекрестными несущими, показания относительно того, запланирована ли рассматриваемая сота SCell каналом PDCCH в упомянутой рассматриваемой соте SCell или нет, и если нет, возможно, также, какие сигналы обслуживающей соты разрешает нисходящая линия связи и восходящая линия связи, если ресурсы восходящей линии связи сконфигурированы, для рассматриваемой соты SCell.

Применимость описанных здесь способов может зависеть от состояния блока WTRU и/или базовой станции. Например, применимость способа может зависеть от следующих факторов: работает ли таймер TAT, применимый к обслуживающей соте; имеет ли линия связи SCell UL другие требования опережения по времени по сравнению по меньшей мере с одной другой несущей UL CC, сконфигурированной для блока WTRU; сконфигурированы ли выделенные ресурсы (например, SPS, канал PUCCH, сигнал SRS) для линии связи SCell UL; сконфигурированы ли выделенные ресурсы (например, SPS) для несущей DL CC, соответствующей несущей UL CC; привязка между одной или более несущими DL CC и несущей UL CC, например, через отображение для информации обратной связи HARQ; сконфигурирована ли функция отчетов запаса мощности для несущей UL CC; и имеет ли процесс HARQ данные, оставшиеся в его буфере (то есть, процесс HARQ еще не завершил передачу транспортного блока в своем буфере). Описанные здесь примеры в общем применимы независимо от того, сконфигурирован и/или применим ли режим DRX для несущей CC.

Варианты осуществления

1. Способ, реализованный в блоке беспроводной передачи и приема (блок WTRU) для обработки агрегацию несущих, содержащий этап, на котором конфигурируют для блока WTRU первичную соту (соту PCell).

2. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором конфигурируют для блока WTRU по меньшей мере одну вторичную соту (соту SCell).

3. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором обрабатывают информацию на основе состояния по меньшей мере одной соты SCell.

4. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой команду активации/деактивации управляющего

ASUS EX2019-p.261
Samsung v. ASUS
IPR2024-00614

элемента (CE) управления доступом к среде передачи (MAC), блок WTRU выполнен с возможностью изменять состояние по меньшей мере одной соты SCell в ответ на команду активации/деактивации.

5. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой команду активации/деактивации, которая применяется для каждой сконфигурированной соты SCell, блок WTRU выполнен с возможностью изменять состояние по меньшей мере одной соты SCell в ответ на команду активации/деактивации.

6. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является сконфигурированным или неактивным, и информация представляет собой команду активации по меньшей мере для одной соты SCell, способ дополнительно содержит этап, на котором инициируют отчет запаса мощности при условии, что по меньшей мере одна сота SCell имеет сконфигурированные ресурсы восходящей линии связи.

7. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является сконфигурированным или неактивным, и информация представляет собой по меньшей мере команду активации по меньшей мере для одной соты SCell, способ дополнительно содержит этап, на котором определяют на основе информации одну конфигурацию из конфигурации отслеживания физического канала управления нисходящей линии связи и конфигурации планирования с перекрестными несущими.

8. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой сконфигурированное значение для определения начального символа физического совместно используемого канала нисходящей линии связи по меньшей мере для одной соты SCell для конфигурации планирования с перекрестными несущими.

9. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является активным, и информация представляет собой команду деактивации по меньшей мере для одной соты SCell, способ дополнительно содержит этап, на котором прекращают отслеживание физического канала управления нисходящей линии связи по меньшей мере для одной соты SCell.

10. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором прекращают прием назначений нисходящей линии связи или разрешений восходящей линии связи, соответствующих по меньшей мере одной соте SCell.

11. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой сконфигурированное значение, указывающее конфигурацию планирования с перекрестными несущими, способ дополнительно содержит этап, на котором определяют, какая сота SCell сигнализирует о выделениях нисходящей линии связи и разрешениях восходящей линии связи.

12. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой определение отказа передачи запроса планирования, способ дополнительно содержит этап, на котором высвобождают конфигурацию отчетов об индикаторе качества канала, индексе матрицы предварительного кодирования и индикаторе класса для сконфигурированных сот SCell.

13. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой определение отказа передачи запроса планирования, способ дополнительно содержит этап, на котором высвобождают конфигурацию

ASUS EX2019-p.262
Samsung v. ASUS
IPR2024-00614

отчетов опорного сигнала зондирования для сконфигурированных сот SCell.

14. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой показание относительно повторного установления соединения контроллера беспроводных ресурсов, способ дополнительно содержит этап, на котором высвобождают конфигурацию по меньшей мере для одной соты SCell.

15. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором для каждого транспортного блока определяют информационное содержание, которое должно быть передано, на основе характеристики информации, причем информация представляет собой управляющую информацию.

16. Способ по любому из предыдущих вариантов осуществления, в котором тип управляющей информации основан на передаче по меньшей мере для соты SCell или первичной соты.

17. Способ по любому из предыдущих вариантов осуществления, в котором тип управляющей информации основан на передаче управляющей информации либо на физическом совместно используемом канале восходящей линии связи, либо в одновременных передачах на физическом совместно используемом канале восходящей линии связи и физическом канале управления восходящей линии связи.

18. Способ по любому из предыдущих вариантов осуществления, в котором тип управляющей информации основан на передаче управляющей информации либо на указанном физическом канале восходящей линии связи, либо в одновременных передачах на физическом совместно используемом канале восходящей линии связи и физическом канале управления восходящей линии связи, отличающейся от передач не управляющей информации по восходящей линии связи.

19. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют информационное содержание управляющей информации для первичной соты.

20. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют информационное содержание управляющей информации для каждой сконфигурированной соты SCell.

21. Способ по любому из предыдущих вариантов осуществления, в котором по меньшей мере одна сота SCell включает в себя ресурсы нисходящей линии связи и ресурсы восходящей линии связи, привязка между ресурсами нисходящей линии связи и ресурсами восходящей линии связи основана на выделенной сигнализации с использованием идентифицирующей информации по меньшей мере одной соты SCell.

22. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой команду активации/деактивации управляющего элемента (CE) управления доступом к среде передачи (MAC), блок WTRU выполнен с возможностью изменять состояние по меньшей мере одной соты SCell в ответ на команду активации/деактивации, состояние является общим и для ресурсов нисходящей линии связи, и для ресурсов восходящей линии связи.

23. Способ по любому из предыдущих вариантов осуществления, в котором информация представляет собой команду активации/деактивации, которая применяется к сконфигурированной соте SCell, блок WTRU выполнен с возможностью изменять состояние по меньшей мере одной соты SCell в ответ на команду активации/деактивации, состояние является общим и для ресурсов нисходящей линии связи, и для ресурсов восходящей линии связи.

24. Способ по любому из предыдущих вариантов осуществления, в котором информация включает в себя опорные сигналы зондирования, которые не передаются

ASUS EX2019-p.263
Samsung v. ASUS
IPR2024-00614

при условии, что состояние по меньшей мере одной соты SCell деактивировано.

25. Способ по любому из предыдущих вариантов осуществления, в котором информация включает в себя по меньшей мере один элемент множества, состоящего из индикатора качества канала, индекса матрицы предварительного кодирования и индикатора класса, которые не сообщаются при условии, что по меньшей мере одна сота SCell деактивирована.

26. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является активным, и информация представляет собой команду дезактивации, деактивирующую по меньшей мере одну соту SCell относительно события эстафетной передачи.

27. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является неактивным относительно события эстафетной передачи, события реконфигурации или добавления по меньшей мере одной соты SCell к конфигурации блока WTRU.

28. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является активным, и информация представляет собой команду деактивации по меньшей мере для одной соты SCell, способ дополнительно содержит этап, на котором процессор сбрасывает все буферы гибридного автоматического запроса на повторные передачи, соответствующие по меньшей мере одной соте SCell.

29. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является сконфигурированным или неактивным, и информация представляет собой команду активации по меньшей мере для одной соты SCell, способ дополнительно содержит этап, на котором передают отчет запаса мощности для каждой активированной обслуживающей соты, имеющей сконфигурированные ресурсы восходящей линии связи.

30. Способ по любому из предыдущих вариантов осуществления, в котором состояние по меньшей мере одной соты SCell является сконфигурированным или неактивным, и информация представляет собой команду активации по меньшей мере для одной соты SCell, способ дополнительно содержит этап, на котором отслеживают физический канал управления нисходящей линии связи по меньшей мере для одной соты SCell.

31. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором привязывают компонентную несущую (CC) восходящей линии связи (UL) по меньшей мере к одной несущей CC нисходящей линии связи (DL) при приеме управляющей сигнализации.

32. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором получают или поддерживают опережение по времени (TA) восходящей линии связи, требуемое для выполнения передачи на ресурсе восходящей линии связи, соответствующем несущей UL CC.

33. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором получают или поддерживают системную информацию (SI), требуемую для получения доступа к ресурсам восходящей линии связи, соответствующим несущей UL CC, и получения доступа к ресурсам нисходящей линии связи по меньшей мере одной несущей DL CC, соответствующей несущей UL CC.

34. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этапы, на которых активируют, деактивируют или высвобождают ранее сконфигурированные выделенные ресурсы восходящей линии связи для несущей UL CC, в том числе по меньшей мере один ресурс из множества, состоящего из: ресурсов

ASUS EX2019-p.264
Samsung v. ASUS
IPR2024-00614

физического канала управления восходящей линией связи (PUCCH), выделенных для индикатора качества канала (CQI), индекса матрицы предварительного кодирования (PMI), индикатора класса (RI) или запроса планирования (SR); ресурсов полупостоянного планирования (SPS); или ресурсов опорного сигнала зондирования (SRS); активируют, деактивируют или высвобождают ранее сконфигурированные выделенные ресурсы нисходящей линии связи для несущей CC, в том числе: ресурсы SPS; получают отчет, указывающий запас мощности блока беспроводной передачи и приема (WTRU) для несущей CC при активации несущей CC; и понижают задержку повторных передач посредством инициирования внутренних отчетов блока WTRU об отказе гибридного автоматического запроса на повторную передачу (HARQ) для процесса HARQ верхнему уровню при явной или неявной деактивации несущей UL CC с использованием службы объекта HARQ, управляющего процессом HARQ.

35. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют режим передачи для сигнализации восходящей линии связи, причем формат передачи основан на нескольких несущих CC.

36. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют ресурса для подтверждения управляющей сигнализации для активации или деактивации несущей CC.

37. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют поведение несущей CC при активации.

38. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют поведение блока WTRU управления доступом к среде передачи (MAC) после реконфигурации несущей CC.

39. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют поведение блока WTRU MAC при деактивации несущей CC.

40. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация включает в себя любой элемент множества, состоящего из сообщений L1, L2 или L3; сообщений управления беспроводными ресурсами; сообщения, которое применяется по меньшей мере к одной несущей CC; сигнализации, принятой на несущей DL CC, которая является активной; или сигнализации, принятой на несущей DL CC, которая является активной, и применяется к другой несущей DL CC.

41. Способ по любому из предыдущих вариантов осуществления, в котором поведение блока WTRU зависит по меньшей мере от одного фактора: работы таймера опережения по времени (TAT), применимого к несущей CC; имеет ли несущая UL CC другое требование опережения по времени по сравнению по меньшей мере с одной другой несущей UL CC, сконфигурированной для блока WTRU; сконфигурированы ли выделенные ресурсы, включающие в себя по меньшей мере один элемент из SPS, PUCCH или SRS, для несущей UL CC; сконфигурированы ли выделенные ресурсы для несущей DL CC, соответствующей несущей UL CC; привязки между одной или более несущими DL CC и несущей UL CC через отображение для информации обратной связи HARQ; сконфигурирована ли функция отчета запаса мощности (PHR) для несущей UL CC; или имеет ли процесс HARQ данные в своем буфере.

42. Способ по любому из предыдущих вариантов осуществления, в котором блок WTRU находится в режиме прерывистого приема (DRX).

43. Способ по любому из предыдущих вариантов осуществления, в котором блок WTRU не находится в режиме DRX.

44. Способ по любому из предыдущих вариантов осуществления, дополнительно

ASUS EX2019-p.265
Samsung v. ASUS
IPR2024-00614

содержащий этап, на котором определяют при активации посредством блока WTRU, выровнен ли блок WTRU по времени.

45. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при условии, что блок WTRU не выровнен по времени, выполняют процедуры для достижения выравнивания по времени восходящей линии связи по меньшей мере для одной несущей CC в подмножестве несущих CC и поддержания выравнивания по времени по меньшей мере для одной несущей CC в подмножестве несущих CC.

46. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют при активации подмножества несущих CC посредством блока WTRU, должен ли блок WTRU обновить системную информацию, соответствующую по меньшей мере одной несущей CC с агрегацией несущих (CA) подмножества несущих CC.

47. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют обновление системной информации при условии, что требуется обновление системной информации.

48. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют при активации или деактивации подмножества несущих CC посредством блока WTRU, требуется ли выполнить над сконфигурированными выделенными ресурсами восходящей линии связи по меньшей мере одно действие: остановить, запустить или высвободить.

49. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют по меньшей мере одну процедуру из остановки, запуска или высвобождения над сконфигурированными ресурсами восходящей линии связи при условии, что эта процедура требуется.

50. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют при деактивации подмножества несущих CC с агрегацией несущих, следует ли высвободить сконфигурированные выделенные ресурсы нисходящей линии связи.

51. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру высвобождения сконфигурированного ресурса нисходящей линии связи при условии, что эта процедура требуется.

52. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, следует ли инициировать передачу отчета PHR для несущей UL CC.

53. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру передачи отчета PHR при условии, что эта процедура требуется.

54. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют при деактивации подмножества несущих CC с агрегацией несущих, следует ли сообщить верхнему уровню об отказе HARQ для блока данных протокола (блок PDU) MAC.

55. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру инициирования повторной передачи при условии, что эта процедура требуется.

56. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, может ли несущая UL CC или несущая DL

ASUS EX2019-p.266
Samsung v. ASUS
IPR2024-00614

CC быть активирована или деактивирована, при приеме управляющей сигнализации.

57. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором активируют по меньшей мере одну сконфигурированную несущую CC или отключают экономию мощности по меньшей мере для одной сконфигурированной несущей CC при обнаружении проблем физического уровня или обнаружении ухудшения качества линии беспроводной связи ниже порога.

58. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором неявно изменяют режим передачи для управляющей сигнализации восходящей линии связи в субкадре.

59. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют ресурс для передачи подтверждения.

60. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при активации несущей CC определяют ресурсы и соответствующую несущую UL CC для передачи информации обратной связи HARQ и следует ли отслеживать канал PDDCH, соответствующий активированной несущей CC.

61. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют формат управляющей информации нисходящей линии связи (DCI) для отслеживания на канале PDDCH.

62. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, следует ли передать сигнал SRS на сконфигурированном периодическом ресурсе.

63. Способ по любому из предыдущих вариантов осуществления, в котором об активации или деактивации сигнализируют через управляющую сигнализацию, или она подразумевается на основе привязки к другой несущей CC.

64. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация передается посредством любой сигнализации из сигнализации L3; сигнализации L2; или сигнализации L1, причем сигнализация L1 включает в себя физический канал управления нисходящей линии связи (PDCCH), и причем канал PDCCH представляет собой расширение по меньшей мере одного из следующих элементов: заказа канала PDCCH на произвольный доступ с индикатором формата управления (CFI), соответствующим второй несущей CC; назначение нисходящей линии связи канала PDCCH с индикатором CFI, соответствующим второй несущей CC; разрешение восходящей линия связи канала PDCCH с индикатором CFI, соответствующим второй несущей CC; активация канала PDCCH с индикатором CFI, соответствующим второй несущей CC; или любой канал PDCCH с явным полем, указывающим, может ли блок WTRU выполнить произвольный доступ.

65. Способ по любому из предыдущих вариантов осуществления, в котором вторая несущая CC представляет собой любую несущую CC из множества сконфигурированных несущих CC для блока WTRU, спаренную с несущей DL CC, на которой принята управляющая сигнализация.

66. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация содержит по меньшей мере один из следующих элементов: показание относительно того, может ли блок WTRU выполнить произвольный доступ, включающее в себя по меньшей мере использование ресурсов, соответствующих несущей CC, указанной индикатором CFI, или использование явно указанных ресурсов произвольного доступа; показание относительно того, изменилась ли системная информация, имеющая отношение ко второй несущей CC, на основе тега значения системной информации, причем тег значения является 5-битовым или простым двоичным

ASUS EX2019-p.267
Samsung v. ASUS
IPR2024-00614

показанием, и тег значения представляет часть системной информации, имеющей отношение ко второй несущей CC, причем эта часть должна быть действительной для правильного функционирования на второй несущей CC; команду выравнивания по времени (TAC), причем команда TAC применяется по меньшей мере к одному элементу множества, состоящего из: несущей UL CC, идентифицированной в управляющей сигнализации; несущей UL CC, соответствующей активируемой несущей CC; группы несущих UL CC, имеющих одинаковые требования опережения по времени; конфигурации блока WTRU, включающей в себя по меньшей мере одну конфигурацию из конфигурации канала PUCCH для ресурсов сигнала ACK/NACK HARQ, индикатора CQI, индекса PMI или индикатора RI; конфигурации сигналов SRS; конфигурации SPS; конфигурации беспроводных ресурсов, в том числе: режима передачи несущей CC или индекса для множества ресурсов восходящей/нисходящей линии связи; показание относительно того, что по меньшей мере одна функция может быть ограничена подмножеством несущих CC, в том числе случай, когда функция применяется только к одной несущей CC; показание относительно того, что блок WTRU рассматривает несущие CC как несущие PCC; при условии, что отображение между несущей PCC восходящей/нисходящей линией связи отличается от отображения между восходящей/нисходящей линией связи, указанного посредством системной информацией несущей DL CC, блок WTRU рассматривает несущие CC только для несущей PCC восходящей линии связи или только для несущей PCC нисходящей линии связи; индикатор формата управления (CFI), причем блок WTRU определяет размер области управления несущей DL CC, причем несущая DL CC активирована и является вторичной несущей CC блока WTRU; конфигурацию по меньшей мере для одного элемента множества, состоящего из: несущей UL CC, соответствующей активируемой несущей CC; несущей UL CC, соответствующей PCC; или другой несущей CC, явно указанной в управляющей сигнализации; показание относительно того, продолжает ли блок WTRU использовать ранее сконфигурированные ресурсы восходящей/нисходящей линии связи, в том числе по меньшей мере один ресурс из ресурсов PUCCH для разрешения или назначения ACK/NACK, CQI, PMI, RI, SR, SRS, SPS; индекса для элемента в множестве ранее сконфигурированных ресурсов восходящей/нисходящей линии связи; или показание относительно того, высвобождает ли блок WTRU ранее сконфигурированные средства восходящей/нисходящей линии связи.

67. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация содержит по меньшей мере один из следующих элементов информации: показание относительно того, используются ли ресурсы канала PUCCH для информации обратной связи HARQ на несущей UL CC; соответствуют несущей CC, в которой была принята управляющая сигнализация; соответствуют обслуживающей несущей; сконфигурированы для отчета информации обратной связи HARQ для передач физического совместно используемого канала нисходящей линии связи (PDSCH) на нескольких несущих DL CC или в одном из множества сконфигурированных расположений канала PUCCH; или показание в управляющей сигнализации, применимой к несущей DL CC, указывающее, следует ли декодировать канал PDCCH на несущей DL CC.

68. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этапы, на которых: определяют, передана ли информация обратной связи в расположении области управления несущей UL CC, на основе по меньшей мере одного элемента множества, состоящего из: несущей UL CC, соответствующей либо несущей UL CC, сконфигурированной для всех передач информации обратной связи HARQ;

ASUS EX2019-p.268
Samsung v. ASUS
IPR2024-00614

несущей UL CC, соответствующей несущей DL CC, на которой была принята управляющая сигнализация; или несущей UL CC, сконфигурированной с целью передачи информации обратной связи; расположения несущей UL CC, соответствующего по меньшей мере одному элементу множества, состоящего из: расположения, вычисленного на основе первого элемента канала управления (CCE) канала PDCCH, который указал наличие управляющей сигнализации; одного из множества сконфигурированных расположений, обозначенных индексом, обеспеченным в управляющей сигнализации; или смещения расположения от области канала PUCCH несущей UL CC, которое получено на основе индекса для соответствующей несущей DL CC.

69. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация обеспечивает последовательную активацию или деактивацию.

70. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором поддерживают упорядоченный список сконфигурированных несущих CC.

71. Способ по любому из предыдущих вариантов осуществления, в котором тег значения обеспечен в системной информации второй несущей CC в дополнение к существующему тегу значения, представляющему всю системную информацию.

72. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором отслеживают и обнаруживают по меньшей мере одно событие из проблем физического уровня или ухудшения качества линии беспроводной связи ниже порога.

73. Способ по любому из предыдущих вариантов осуществления, в котором отслеживание и обнаружение выполняются по меньшей мере для одного элемента множества, состоящего из: специальной соты; по меньшей мере одной сконфигурированной несущей CC, которая не соответствует специальной соте, и несущая CC является активной или неактивной; или по меньшей мере одной сконфигурированной несущей CC, включающей в себя специальную соту, и несущая CC является активной или неактивной.

74. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при обнаружении проблем физического уровня или ухудшения линии радиосвязи активируют первую несущую DL CC или непрерывно отслеживают управляющую сигнализацию.

75. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при обнаружении проблем физического уровня или ухудшения линии радиосвязи активируют первую несущую DL CC и непрерывно отслеживают управляющую сигнализацию, причем активирование или непрерывное отслеживание выполняются, пока блок WTRU не принимает управляющую сигнализацию, в том числе по меньшей мере один элемент множества, состоящего из: явного сообщения деактивации компонентной несущей (CC); сообщения реконфигурации беспроводной связи с информационным элементом управления мобильностью; сообщения реконфигурации беспроводной связи без информационного элемента управления мобильностью; или истечения времени таймера.

76. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором инициируют процедуру эстафетной передачи, повторного установления соединения или реконфигурации по истечении времени таймера.

77. Способ по любому из предыдущих вариантов осуществления, в котором активация или непрерывное отслеживание выполняется по меньшей мере для одного элемента из:

ASUS EX2019-p.269
Samsung v. ASUS
IPR2024-00614

специальной соты; по меньшей мере одной сконфигурированной несущей CC, которая не соответствует специальной соте, и несущая CC является активной или неактивной; или по меньшей мере одной сконфигурированной несущей CC, включающей в себя специальную соту, и несущая CC является активной или неактивной.

78. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором принимают и декодируют на первой несущей DL CC управляющую сигнализацию для активации по меньшей мере одной второй несущей CC.

79. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором активируют первую несущую DL CC на основе приема любого элемента множества, состоящего из: управляющей сигнализации для передач на первой несущей DL CC; любой управляющей сигнализации для несущей DL CC; или управляющей сигнализации с использованием любого из множества предопределенных сигнальных форматов.

80. Способ по любому из предыдущих вариантов осуществления, в котором форматы включают в себя по меньшей мере один формат из множества, состоящего из: формата 0 управляющей информации нисходящей линии связи (DCI); формата 1A DCI; формата 3/3A DCI; или существующего формата с фиксированной кодовой точкой.

81. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, предназначена ли сигнализация для активации, на основе формата.

82. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют тип сигнализации на основе индикатора поля несущей (CFI).

83. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором активируют первую несущую UL CC на основе приема любого элемента множества, состоящего из: управляющей сигнализации, указывающей разрешение ресурсов восходящей линии связи; управляющей сигнализации для передач на несущей DL CC; или любой управляющей сигнализация для несущей DL CC, соответствующей несущей UL CC.

84. Способ по любому из предыдущих вариантов осуществления, в котором активация несущей UL CC основана на любом элементе множества, состоящего из: включает ли в себя выделенная конфигурация параметры конфигурации для ресурсов восходящей линии связи, или на основе отсутствия для соответствующей пары восходящей/нисходящей линии связи по меньшей мере одного информационный элемента (IE).

85. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этапы, на которых принимают канал PDCCH; и отслеживают канал PDCCH для несущей DL CC для разрешений и назначений на ресурсах нисходящей линии связи, соответствующих второй несущей CC, при условии, что блок беспроводной передачи и приема (WTRU) сконфигурирован для приема канала PDCCH.

86. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором поддерживают выравнивание по времени восходящей линии связи, причем блок WTRU выполняет произвольный доступ с использованием ресурсов канала произвольного доступа (RACH), соответствующих второй несущей CC, при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание инициировать произвольный доступ, или при условии, что выравнивание по времени, применимое к ресурсам восходящей линии связи, соответствующим второй несущей CC, не допустимо, или при условии, что управляющая

ASUS EX2019-p.270
Samsung v. ASUS
IPR2024-00614

сигнализация отправлена с использованием канала PDCCH и скремблировала с использованием заданного временного идентификатора беспроводной сети (RNTI).

87. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором применяют принятую команду TAC к выравниванию по времени несущей UL CC, соответствующей несущей DL CC, на которой команда TAC была принята, или выравниванию по времени всех несущих UL CC, имеющих такие же требования выравнивания по времени, как и несущая UL CC, соответствующая несущей DL CC, на которой команда TAC была принята, для применения команды TAC после активации второй несущей CC.

88. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором поддерживают допустимую системную информацию для второй несущей CC посредством получения системной информации для второй несущей CC с использованием традиционного сбора системной информации при условии, что блок WTRU не имеет сохраненной системной информации для второй несущей CC, или при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание получить системную информацию, или управляющая сигнализация включает в себя тег значения, указывающий, что сохраненная системная информация больше не действительна, или при условии, что управляющая сигнализация отправлена с использованием канала PDCCH и скремблирована с использованием заданного идентификатора RNTI.

89. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором используют сконфигурированные ресурсы восходящей линии связи для обработки сконфигурированных ресурсов восходящей линии связи для второй несущей CC, при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание активировать сконфигурированные ресурсы восходящей линии связи, соответствующие второй несущей CC, или при условии, что выравнивание по времени, применимое к ресурсам восходящей линии связи, соответствующим второй несущей CC, допустимо, или при условии, что управляющая сигнализация отправлена с использованием канала PDCCH и скремблирована с использованием заданного временного идентификатора беспроводной сети (RNTI).

90. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором используют ресурсы нисходящей линии связи для обработки сконфигурированных ресурсов нисходящей линии связи для второй несущей CC, при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание активировать сконфигурированные ресурсы нисходящей линии связи, соответствующие второй несущей CC, или на условии, что управляющая сигнализация отправлена с использованием канала PDCCH и скремблирована с использованием заданного идентификатора RNTI.

91. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этапы, на которых сообщают блоку WTRU отчет запаса мощности для второй несущей CC; при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание инициировать отчет PHR; или при условии, что требование запаса мощности, применимое к несущей UL CC, соответствующей второй несущей CC, отличается от этого требования любых других активных несущих UL CC: инициируют отчет PHR, причем отчет PHR соответствует запасу мощности на несущей UL CC, соответствующей второй несущей CC; при условии, что отчет PHR был инициирован и ожидает передачи; и при условии, что блок WTRU имеет ресурсы совместно используемого канала восходящей линии связи (SCH) для новой передачи,

ASUS EX2019-p.271
Samsung v. ASUS
IPR2024-00614

сообщают допустимое значение PHR, применимое к несущей UL CC, соответствующей второй несущей CC, выполняя одно действие из следующего: сообщают отчет PHR в элементе управления PHR MAC в блоке PDU MAC, переданном на ресурсе канала UL-SCH несущей UL CC, соответствующей второй несущей CC; сообщают отчет PHR в управляющем элементе PHR MAC в блоке PDU MAC переданном на ресурсе канала UL-SCH любой несущей UL CC, для которой применим вычисленный PHR; или сообщают отчет PHR в управляющем элементе PHR MAC, включающем в себя индикатор CFI, указывающий, для какой несущей UL CC применимо сообщаемое значение PHR, в блоке PDU MAC, переданном на ресурсе канала UL-SCH любой несущей UL CC; и при условии, что значение PHR вычислено для несущей UL CC с использованием измерения или оценки на основе несущей DL CC, при рассмотрении посредством блока WTRU любой из несущих DL CC, соответствующих несущей UL CC, для который вычислен PHR.

92. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором деактивируют первую несущую DL CC при условии, что таймер работает, и выполняется по меньшей мере одно из условий: нет проблем физического уровня, или качество линии радиосвязи увеличивается выше порога; или таймер остановлен или истекает, и первая несущая DL CC была деактивирована до запуска таймера вследствие обнаружения проблем физического уровня.

93. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором принимают и декодируют посредством блока WTRU на первой несущей DL CC на любой из активных несущих CC для блока WTRU управляющую сигнализацию для деактивации по меньшей мере одной второй несущей CC.

94. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором деактивируют первую несущую DL CC на основе приема любого элемента множества, состоящего из: управляющей сигнализации для передач на первой несущей DL CC; любой управляющей сигнализации для несущей DL CC; или управляющей сигнализации с использованием любого формата из множества предопределенных сигнальных форматов.

95. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором деактивируют несущую UL CC на основе приема любого элемента множества, состоящего из: управляющей сигнализации, указывающей разрешение ресурсов восходящей линии связи; управляющей сигнализации для передач на несущей DL CC; или любой управляющей сигнализации для несущей DL CC, соответствующей несущей UL CC.

96. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором не отслеживают канал PDCCH для несущей DL CC для разрешений и назначений на ресурсах нисходящей линии связи, соответствующих второй несущей CC.

97. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором прекращают любые передачи восходящей линии связи для несущей UL CC для деактивированных несущих CC через некоторое время после успешного декодирования управляющей сигнализации.

98. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором высвобождают конфигурацию для любых ресурсов восходящей линии связи для SRS и для CQI/PMI/RI/SR на канале PUCCH и для SPS для обработки сконфигурированных ресурсов восходящей линии связи, при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание

ASUS EX2019-p.272
Samsung v. ASUS
IPR2024-00614

высвободить ресурсы восходящей линии связи для SRS и для CQI/PMI/RI/SR на канале PUCCH и для SPS, или управляющая сигнализация отправлена с использованием канала PDCCH и скремблирована с использованием заданного идентификатора RNTI, или при условии, что выравнивание по времени, применимое к ресурсам восходящей линии связи, соответствующим второй несущей CC, является больше не действительным после деактивации.

99. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором высвобождают конфигурацию для ресурсов нисходящей линии связи для несущей DL CC для обработки сконфигурированных ресурсов нисходящей линии связи, при условии, что управляющая сигнализация, принятая на первой несущей CC, включает в себя показание высвободить сконфигурированные ресурсы нисходящей линии связи, соответствующие второй несущей CC, или при условии, что управляющая сигнализация отправлена с использованием канал PDCCH и скремблирована с использованием заданного идентификатора RNTI.

100. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором для несущей UL CC для обработки процессов HARQ, которые еще не завершили передачи при деактивации несущей CC, с использованием службы соответствующего объекта HARQ, и которые либо приостановлены, либо имеют текущие повторные передачи; при условии, что процесс HARQ имеет данные в своем буфере; указывают верхним уровням, что передача для соответствующего блока SDU MAC потерпела неудачу; и сбрасывают буферы HARQ.

101. Способ по любому из предыдущих вариантов осуществления, в котором конфигурация или реконфигурация RRC неявно инициирует процедуры произвольного доступа.

102. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при деактивации несущей CC, причем несущая CC имеет текущую процедуру произвольного доступа, выполняют по меньшей мере одно из следующих действий: останавливают любую текущую процедуру канала RACH для деактивированной несущей CC; отбрасывают явно сообщенную преамбулу и ресурсы физического канала произвольного доступа (PRACH), соответствующие деактивированной несущей CC; или высвобождают временный идентификатор C-RNTI, соответствующий деактивированной компонентной несущей.

103. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором после деактивации несущей CC, причем несущая CC сконфигурирована для обработки состояния процесса HARQ несущей CC, выполняют по меньшей мере одно из следующих действий: устанавливают индикаторы NDI равными 0 для всех HARQ восходящей линии связи; или сбрасывают буферы HARQ нисходящей линии связи.

104. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выбирают режим передачи для передачи управляющей сигнализации на каналах PUCCH или PUSCH для несущей UL CC.

105. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при условии, что блок WTRU выполнен с возможностью сообщать управляющую сигнализацию, причем управляющая информация по меньшей мере для одной несущей DL CC включена в один и тот же формат передачи, управляющая сигнализация включает в себя по меньшей мере один элемент множества, состоящего из: управляющей информации для нескольких несущих CC и агрегирована в том же самом формате передачи; информации обратной связи HARQ для передачи

ASUS EX2019-p.273
Samsung v. ASUS
IPR2024-00614

канала PDSCH; или информации обратной связи CQI/PMI/RI.

106. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при условии, что блок WTRU активирует или деактивирует по меньшей мере одну несущую DL CC, причем эта активация или деактивация приводит к другому количеству несущих CC, для которых блок WTRU сообщает управляющую сигнализацию в одном и том же формате передачи, посредством блока WTRU выполняют по меньшей мере одно из следующих действий: изменяют режим передачи для любой комбинации CQI, PMI или RI при сообщении отчетов на каналах PUSCH или PUCCH; в субкадре, в котором блок WTRU принял управляющую сигнализацию для активации или деактивации несущих CC, спустя предопределенное количество времени от субкадра, в котором блок WTRU принял управляющую сигнализацию для активации или деактивации несущих CC, или спустя предопределенное количество времени от субкадра, в котором блок WTRU передал подтверждение управляющей сигнализации, изменяют форматы DCI, который он отслеживает на канале PDCCH; при условии, что используется планирование с перекрестными несущими, декодируют форматы DCI соответственно для количества назначений и разрешений, соответствующего количеству активных несущих CC; или при условии, что разные режимы передачи поддерживаются на разных активированных несущих CC, для которых блок WTRU отслеживает назначения и разрешения в соответствующем канале PDCCH, декодируют форматы DCI соответствующим образом для количества назначений и разрешений, соответствующего количеству активных несущих CC, поддерживающих каждый режим.

107. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют посредством блока WTRU при условии, что: субкадр, в котором блок WTRU принял управляющую сигнализацию для активации или деактивации по меньшей мере одной несущей CC, или спустя фиксированное количество времени от субкадра, в котором блок WTRU принял управляющую сигнализацию для активации или деактивации по меньшей мере одной несущей CC, или спустя фиксированное количество времени от субкадра, в котором блок WTRU передал подтверждение управляющей сигнализации, или для несущей DL CC при активации или деактивации одной или более несущих CC для декодирования управляющей информации нисходящей линии связи; по меньшей мере одно из следующего для данного канала PDCCH: формат DCI для декодирования; физические ресурсы; или количество попыток декодирования, которое следует выполнить; на основе по меньшей мере одного из следующего: канал PDCCH несущей DL CC поддерживает планирования с перекрестными несущими по меньшей мере к одной другой несущей CC; несколько активированных несущих UL CC и несущих DL CC и их соответствующие режимы передачи, для которых канал PDCCH переносит назначение нисходящей линии связи или разрешение восходящей линии связи; или формат DCI с использованием дополнительного поля CFI или специальных кодовых точек.

108. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором для несущей UL CC для определения, следует ли передать сигнал SRS на сконфигурированном ресурсе SR в несущей UL CC, посредством блока WTRU выполняют по меньшей мере одно из следующих действий: передают сигнал SRS на несущей UL CC с использованием сконфигурированных ресурсов сигнала SRS; запускают таймер или перезапускают таймер при условии, что таймер работает, в том числе по меньшей мере одно из следующих событий: при (ре)конфигурации несущей UL CC, не удаляющей несущую UL CC; при приеме разрешения восходящей линии связи для канала PUSCH для несущей UL CC; при передаче канала PUSCH на несущей UL CC;

ASUS EX2019-p.274
Samsung v. ASUS
IPR2024-00614

при инициировании или передаче по меньшей мере одного из SR или BSR, и достижении буфером блока WTRU сконфигурированного порога; при достижении буфером блока WTRU сконфигурированного порога; или при передаче сигнала SRS на несущей UL CC с использованием сконфигурированных ресурсов сигнала SRS в течение некоторого времени после возникновения одного из событий.

109. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором запускают таймер или перезапускают таймер при условии, что таймер уже работает.

110. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором передают сигнал SRS на несущей UL CC с использованием сконфигурированных ресурсов сигнала SRS.

111. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором прекращают передачу сигнала SRS на несущей UL CC при условии, что время таймера истекает.

112. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором для несущей DL CC или несущей UL CC с целью обработки поведения MAC блока WTRU для реконфигурации, включающей в себя удаление по меньшей мере одной несущей CC, посредством блока WTRU выполняют по меньшей мере одно из следующих действий: останавливают текущую процедуру канала RACH для удаленной несущей CC; отбрасывают явно сообщенную преамбулу и ресурс канала PRACH, соответствующий удаленной несущей CC; или высвобождают временный индикатор C-RNTI, соответствующий удаленной несущей CC.

113. Способ по любому из предыдущих вариантов осуществления, в котором конфигурация или реконфигурация RRC дополнительных несущих CC неявно инициируют отчет PHR.

114. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором используют планирование с перекрестными несущими, причем физические беспроводные ресурсы для передачи нисходящей линии связи или разрешенные ресурсы для передачи восходящей линии связи для передач канала PDSCH на данной несущей DL CC или для передач канала PUSCH на данной несущей UL CC могут быть назначены с использованием канала PDCCH другой несущей DL CC или несущей DL CC, не спаренной с несущей UL CC.

115. Способ по любому из предыдущих вариантов осуществления, в котором при условии, что несущая DL CC активирована, для которой соответствующий канал PDCCH также активирован и известно отношение планирования с перекрестными несущими между разными сконфигурированными несущими, способ дополнительно содержит этап, на котором гарантируют, что другие соответствующие несущие CC могут быть запланированы как можно скорее.

116. Способ по любому из предыдущих вариантов осуществления, в котором при условии, что отношение планирования с перекрестными несущими между разными сконфигурированными несущими не известно, способ дополнительно содержит этап, на котором определяют, какая несущая DL CC может использоваться для планирования недавно активированных несущих CC, на основе управляющей сигнализации активации.

117. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация включает в себя показание относительно того, применима ли сигнализация с перекрестными несущими для канала PDCCH несущей DL CC.

118. Способ по любому из предыдущих вариантов осуществления, в котором информация управляющей сигнализации дополнительно включает в себя явное

ASUS EX2019-p.275
Samsung v. ASUS
IPR2024-00614

показание или идентифицирующую информацию, какие несущие DL CC могут обеспечить управляющую информацию планирования для несущей CC.

119. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация включает в себя показание относительно того, применима ли сигнализация с перекрестными несущими для канала PUSCH несущей UL CC.

120. Способ по любому из предыдущих вариантов осуществления, в котором для несущей DL CC с целью активации несущей CC способ дополнительно содержит этап, на котором активируют несущую DL CC при получении управляющей сигнализации.

121. Способ по любому из предыдущих вариантов осуществления, в котором при условии, что блок WTRU выполнен с возможностью отслеживать канал PDCCH несущей DL CC, способ дополнительно содержать этап, на котором активируют любую другую несущую CC, для которой канал PDCCH может обеспечить управляющую сигнализацию, которая может включать в себя любую другую несущую CC, для которой применимо планирование с перекрестными несущими от канала PDCCH несущей DL CC.

122. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация включает в себя любой элемент множества, состоящего из: назначений нисходящей линии связи, разрешений восходящей линии связи, или других сообщений управления.

123. Способ по любому из предыдущих вариантов осуществления, в котором для несущей CC или нескольких несущих CC с целью деактивации несущей CC способ дополнительно содержит этап, на котором деактивируют несущую CC на основе деактивации несущей DL CC, которая ранее использовалась для обеспечения управляющей сигнализации.

124. Способ по любому из предыдущих вариантов осуществления, в котором деактивация может быть выполнена, если не возможна дополнительная управляющая сигнализация для несущей CC после деактивации.

125. Способ по любому из предыдущих вариантов осуществления, в котором управляющая сигнализация включает в себя любой элемент множества, состоящего из: назначений нисходящей линии связи, разрешений восходящей линии связи, или других сообщений управления.

126. Способ по любому из предыдущих вариантов осуществления, в котором для несущей UL CC или несущей DL CC с целью планирования с перекрестными несущими способ дополнительно содержит этап, на котором определяют, какой канал PDCCH, соответствующий какой несущей DL CC, может обеспечить управляющую сигнализацию.

127. Способ по любому из предыдущих вариантов осуществления, в котором определение включает в себя любой этап, на котором: определяют, что канал PDCCH несущей DL CC, для которой применима управляющая сигнализация для активации несущей CC, может использоваться для планирования несущей CC; определяют, что канал PDCCH несущей DL CC, от которой принята управляющая сигнализация для активации несущей CC, может далее использоваться для планирования несущей CC; или определяют, что канал PDCCH несущей DL CC может далее использоваться для планирования несущей CC, на основе конфигурации, принятой для несущей CC.

128. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором деактивируют несущую CC по меньшей мере при одном из следующих условий: блок WTRU инициирует процедуру повторного установления соединения RRC; блок WTRU запускает таймер T311; блок WTRU обнаруживает отказ линии беспроводной связи на заданной несущей CC; блок WTRU повторно получает системную информацию вследствие изменения системной информации; блок WTRU

ASUS EX2019-p.276
Samsung v. ASUS
IPR2024-00614

принимает сигнализацию от сети, указывающую эстафетную передачу; блок WTRU запускает таймер T304; или блок WTRU терпит неудачу при процедуре реконфигурации.

129. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором активируют вторичную несущую CC.

130. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором принимают первую управляющую сигнализацию, причем вторичная несущая CC активируется на основе первой управляющей сигнализации.

131. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором деактивируют вторичную несущую CC.

132. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором принимают вторую управляющую сигнализацию, причем вторичная несущая CC деактивируется на основе второй управляющей сигнализации.

133. Способ по любому из предыдущих вариантов осуществления, в котором вторичная несущая CC привязана по меньшей мере к одной из первичной несущей CC восходящей линии связи или первичной несущей CC нисходящей линии связи.

134. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором отправляют запрос планирования (SR).

135. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором деактивируют сконфигурированную и активную вторичную несущую CC при условии, что количество попыток передачи для запроса планирования достигает или превышает сконфигурированное максимальное значение.

136. Способ по любому из предыдущих вариантов осуществления, в котором деактивируется конфигурация по меньшей мере для одного из элементов множества, состоящего из индикатора качества канала (CQI), индекса матрицы предварительного кодирования (PMI) или индикатора класса (RI) для вторичной несущей CC.

137. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором инициируют процедуру произвольного доступа и отменяют ожидающие запросы планирования при условии, что количество попыток передачи для запросов планирования достигает или превышает сконфигурированное максимальное значение.

138. Способ по любому из предыдущих вариантов осуществления, в котором процедура произвольного доступа инициируется на ресурсах восходящей линии связи сконфигурированной вторичной несущей CC.

139. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором очищают любые сконфигурированные назначения нисходящей линии связи и разрешения восходящей линии связи при условии, что количество попыток передачи для запросов планирования достигает или превышает сконфигурированное максимальное значение.

140. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором высвобождают конфигурацию для работы с несколькими несущими при условии, что количество попыток передачи для запросов планирования достигает или превышает сконфигурированное максимальное значение.

141. Способ по любому из предыдущих вариантов осуществления, в котором конфигурация для работы с несколькими несущими, которая высвобождается, включает в себя по меньшей мере один элемент множества, состоящего из вторичной несущей CC, ресурсов канала PUCCH для положительного подтверждения/отрицательного подтверждения (ACK/NACK) гибридного автоматического запроса на повторную передачу (HARQ), индикатора качества канала (CQI), индекса матрицы предварительного

ASUS EX2019-p.277
Samsung v. ASUS
IPR2024-00614

кодирования (PMI), индикатора класса (RI) и запроса планирования (SR) и сконфигурированных назначений или разрешений.

142. Способ по любому из предыдущих вариантов осуществления, в котором высвобождается вся конфигурация с несколькими несущими.

143. Способ по любому из предыдущих вариантов осуществления, в котором активированная вторичная несущая CC деактивируется, и конфигурация для ресурсов физического канала управления восходящей линии связи (PUCCH), относящихся к работе с несколькими несущими, и сконфигурированные назначения или разрешения высвобождаются.

144. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют произвольный доступ посредством выбора доступного ресурса на первичной несущей CC восходящей линии связи.

145. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий, этап, на котором выполняют возврат к работе с одной несущей.

146. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором игнорируют принятое разрешение восходящей линии связи, пока не принята управляющая сигнализация для реконфигурации работы с несколькими несущими.

147. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при активации вторичной несущей CC определяют, выровнена ли синхронизация восходящей линии связи.

148. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуры для выравнивания синхронизации восходящей линии связи.

149. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при активации вторичной несущей CC определяют, следует ли получить системную информацию, имеющую отношение, по меньшей мере, к одной несущей CC.

150. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру для получения системной информации.

151. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при активации или деактивацию вторичной несущей CC определяют, следует ли запустить, остановить или высвободить сконфигурированные выделенные ресурсы восходящей линии связи.

152. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру для запуска, остановки или высвобождения сконфигурированных ресурсов восходящей линии связи.

153. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при деактивации вторичной несущей CC определяют, следует ли высвободить сконфигурированные выделенные ресурсы нисходящей линии связи.

154. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру для высвобождения сконфигурированных выделенных ресурсов нисходящей линии связи.

155. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при активации вторичной несущей CC определяют, следует ли инициировать передачу запаса мощности (PHR) для несущей CC восходящей

ASUS EX2019-p.278
Samsung v. ASUS
IPR2024-00614

линии связи.

156. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуру для передачи PHR.

157. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором при деактивации вторичной несущей CC определяют, следует ли сообщить верхнему уровню об отказе гибридного автоматического запроса на повторную передачу (HARQ) для блока служебных данных (SDU) управления доступом к среде передачи (MAC).

158. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют локальное отрицательное подтверждение (NACK) от объекта MAC до объекта управления линией беспроводной связи (RLC) для несущей UL CC.

159. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором выполняют процедуры для инициирования повторной передачи блока PDU RLC.

160. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором активируют по меньшей мере одну сконфигурированную несущую CC при условии, что обнаружена проблема физического уровня или ухудшение качества линии беспроводной связи ниже определенного порога.

161. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором отключают механизм экономии мощности для активированной несущей CC.

162. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором изменяют режим передачи для управляющей сигнализации восходящей линии связи при обнаружении изменения некоторого количества сконфигурированных или активных несущих DL CC, для которых сообщается информация обратной связи HARQ и/или управляющая информация восходящей линии связи.

163. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, на каком ресурсе следует передавать подтверждение при приеме управляющей сигнализации для первой управляющей сигнализации или второй управляющей сигнализации.

164. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют ресурс и соответствующую несущую UL CC, на которых следует передавать информацию обратной связи гибридного автоматического запроса на повторную передачу (HARQ) при приеме первой управляющей сигнализации или второй управляющей сигнализации.

165. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, следует ли отслеживать физический канал управления нисходящей линии связи (PDCCH), соответствующий активированной несущей CC, при приеме первой управляющей сигнализации или второй управляющей сигнализации.

166. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, какой формат управляющей информации нисходящей линии связи (DCI) следует отслеживать на данном канале PDCCH, при приеме первой управляющей сигнализации или второй управляющей сигнализации.

167. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, следует ли передать опорный сигнал

ASUS EX2019-p.279
Samsung v. ASUS
IPR2024-00614

зондирования (SRS) на сконфигурированном периодическом ресурсе, пока физический совместно используемый канал восходящей линии связи (PUSCH) не является активным.

168. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, следует ли использовать планирование с перекрестными несущими для несущей CC при активации несущей CC.

169. Способ по любому из предыдущих вариантов осуществления, дополнительно содержащий этап, на котором определяют, следует ли активировать дополнительную несущую CC при активации несущей CC.

170. Способ по любому из предыдущих вариантов осуществления, в котором несущая UL CC привязана, по меньшей мере, к одной несущей DL CC.

171. Способ по любому из предыдущих вариантов осуществления, в котором первая управляющая сигнализация или вторая управляющая сигнализация представляют собой сигнализацию либо уровня 1, либо уровня 2, либо уровня 3.

Хотя отличительные признаки и элементы описаны выше в конкретных комбинациях, специалист в области техники поймет, что каждый отличительный признак или элемент могут использоваться отдельно или в любой комбинации с другими отличительными признаками и элементами. Кроме того, описанные здесь способы могут быть реализованы в компьютерной программе, программном обеспечении или программируемом оборудовании, включенном в машиночитаемый носитель для исполнения посредством компьютера или процессора. Примеры машиночитаемых носителей включают в себя электронные сигналы (передаваемые по проводным или беспроводным соединениям) и машиночитаемые запоминающие устройства. Примеры машиночитаемых запоминающих устройств включают в себя, но без ограничения, постоянное запоминающее устройство (ПЗУ; ROM), оперативное запоминающее устройство (ОЗУ; RAM), регистр, кэш-память, устройства полупроводниковой памяти, магнитные носители, такие как внутренние жесткие диски и съемные диски, магнитооптические носители и оптические носители, такие как компакт-диски (CD-ROM) и цифровые универсальные диски (DVD). Процессор совместно с программным обеспечением может использоваться для реализации радиочастотного приемопередатчика для использования в блоке WTRU, пользовательском оборудовании (UE), терминале, базовой станции, контроллере беспроводной сети (RNC) или любом главном компьютере.

Формула изобретения

1. Способ, реализуемый в блоке беспроводной передачи и приема (WTRU), содержащий этапы, на которых:

устанавливают соединение с первичной сотой (PCell);

конфигурируют блок WTRU со вторичной сотой (SCell), причем конфигурирование блока WTRU содержит прием выделенной сигнализации, включающей в себя конфигурацию соты SCell, причем конфигурация соты SCell включает в себя конфигурацию радиоресурса, которая идентифицирует параметры конфигурации для ресурсов нисходящей (DL) линии связи и восходящей (UL) линии связи соты SCell;

поддерживают состояние соты SCell, и

выполняют процедуру в отношении по меньшей мере одного из ресурсов (DL) и (UL), на основе состояния соты SCell.

2. Способ по п. 1, содержащий также этап, на котором: принимают команду активации/деактивации управляющего элемента (CE) управления доступом к среде передачи (MAC), и

ASUS EX2019-p.280
Samsung v. ASUS
IPR2024-00614

изменяют состояние соты SCell в ответ на команду MAC CE активации/деактивации.

3. Способ по п. 2, содержащий также этап, на котором определяют состояние активации/деактивации соты SCell из команды MAC CE активации/деактивации, используя индекс соответствующей соты SCell; и

изменяют состояние соты SCell в соответствии с состоянием активации/деактивации.

4. Способ по п. 1, в котором выполнение процедуры содержит:

инициирование, в ответ на команду активации для соты SCell, отчета запаса мощности при условии, что сота SCell сконфигурирована для передачи по восходящей линии связи.

5. Способ по п. 1, в котором выполнение процедуры содержит этап, на котором:

при условии, что сота SCell сконфигурирована для приема физического канала управления нисходящей линии связи, начинают отслеживать физический канал управления нисходящей линии связи, в ответ на команду активации для соты SCell.

6. Способ по п. 1, содержащий также этап, на котором принимают конфигурацию планирования с перекрестными несущими; и

определяют из конфигурации планирования с перекрестными несущими начальный символ физического совместно используемого канала нисходящей линии связи для соты SCell.

7. Способ по п. 1, в котором выполнение процедуры содержит этапы, на которых:

в ответ на команду деактивации для соты SCell,

прекращают отслеживание физического канала управления нисходящей линии связи для соты SCell; и

прекращают прием назначений нисходящей линии связи или разрешений восходящей линии связи, соответствующих соте SCell.

8. Способ по п. 1, содержащий также этапы, на которых:

принимают конфигурацию планирования с перекрестными несущими; и

определяют, основываясь на конфигурации планирования с перекрестными несущими, обслуживающую соту для приема выделений нисходящей линии связи и разрешений восходящей линии связи для соты SCell.

9. Способ по п. 1, в котором выполнение процедуры содержит:

прекращение отчета об индикаторе качества канала, индексе матрицы предварительного кодирования или индикаторе класса для соты SCell.

10. Способ по п. 1, в котором выполнение процедуры содержит:

высвобождение, в ответ на команду деактивации для соты SCell, конфигурации отчетов опорного сигнала зондирования для соты SCell.

11. Способ по п. 1, содержащий также этап, на котором:

высвобождают конфигурацию для соты SCell в ответ на указание относительно повторного установления соединения контроллера беспроводных ресурсов.

12. Блок беспроводной передачи и приема (WTRU), содержащий:

приемник; и

процессор, соединенный с приемником; при этом

процессор выполнен с возможностью:

устанавливать соединение с первичной сотой (PCell);

конфигурировать блок WTRU со вторичной сотой (SCell), путем приема выделенной сигнализации, включающей в себя конфигурацию соты SCell, причем конфигурация соты SCell включает в себя конфигурацию радиоресурса, которая идентифицирует параметры конфигурации для ресурсов нисходящей (DL) линии связи и восходящей (UL) линии связи соты SCell;

поддерживать состояние соты SCell; и

ASUS EX2019-p.281
Samsung v. ASUS
IPR2024-00614

выполнять процедуру в отношении по меньшей мере одного из ресурсов (DL) и (UL) соты SCell, на основе состояния соты SCell.

13. Блок WTRU по п. 12, в котором процессор также выполнен с возможностью:

высвобождения, в ответ на команду деактивации для соты SCell, конфигурации отчетов опорного сигнала зондирования для соты SCell.

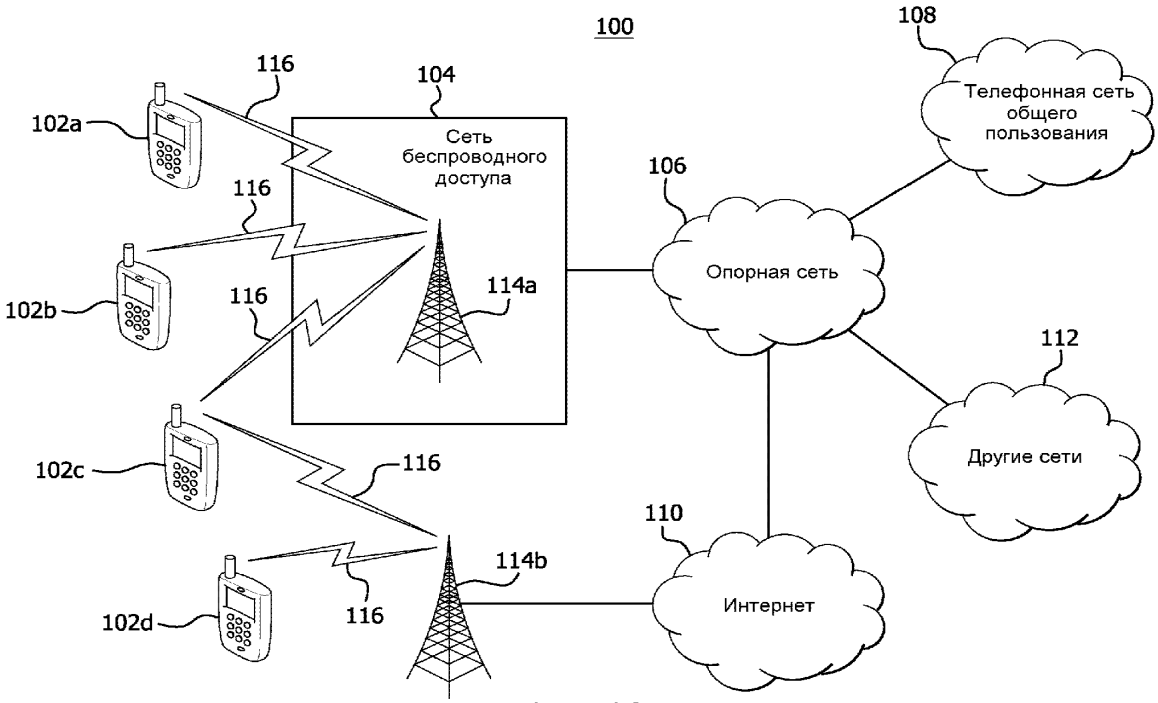
14. Блок WTRU по п. 12, в котором процессор также выполнен с возможностью:

прекращать отчет об индикаторе качества канала, индексе матрицы предварительного кодирования или индикаторе класса для соты SCell.

15. Блок WTRU по п. 12, в котором процессор также выполнен с возможностью:

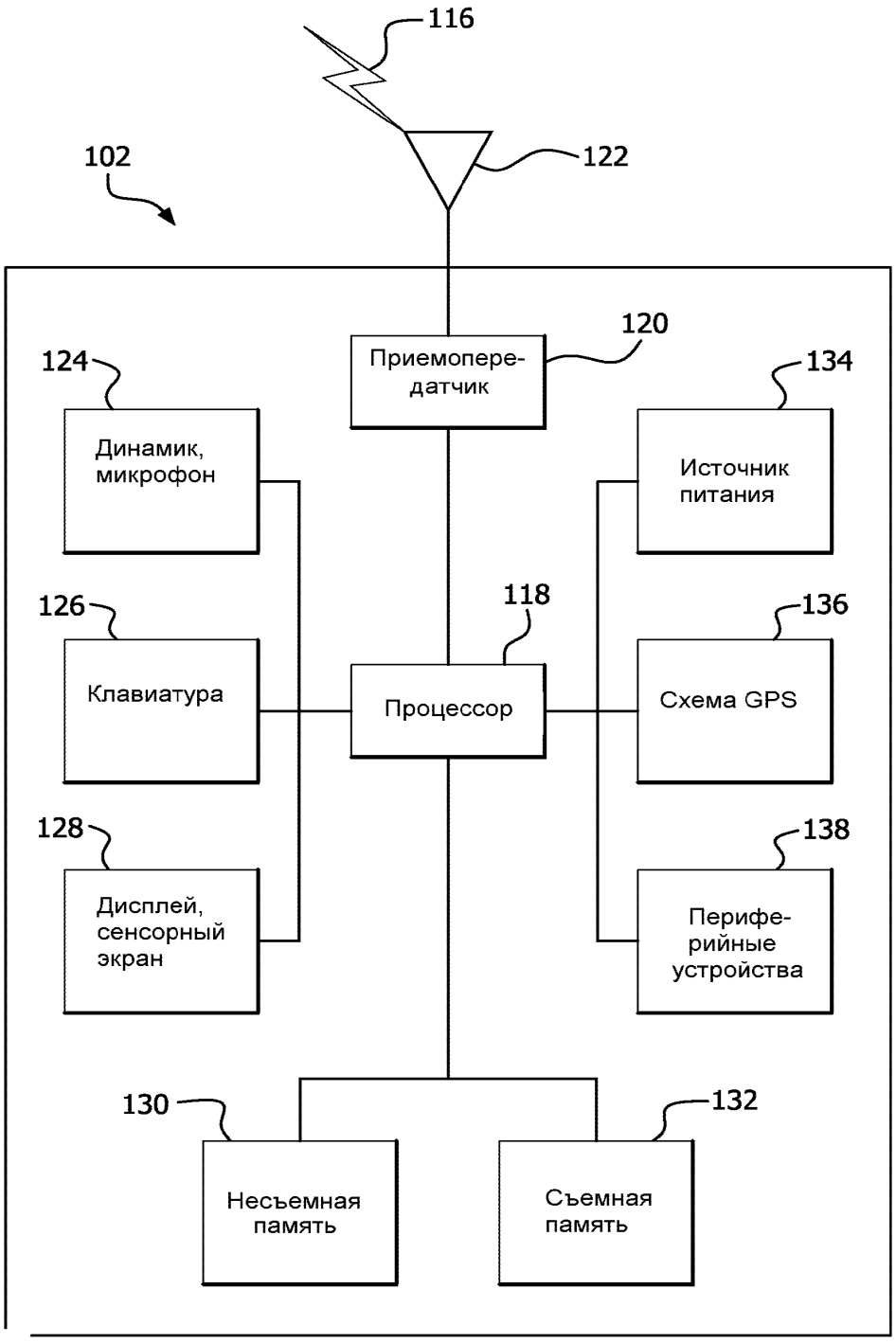
инициировать, в ответ на команду активации для соты SCell, отчет о запасе мощности при условии, что сота SCell сконфигурирована для передачи по восходящей линии связи.

ASUS EX2019-p.282
Samsung v. ASUS
IPR2024-00614



Фиг. 1A

ASUS EX2019-p.283
Samsung v. ASUS
IPR2024-00614



Фиг. 1B

ASUS EX2019-p.284
Samsung v. ASUS
IPR2024-00614

Electronic Acknowledgement Receipt

EFS ID:	37202215
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	73658
Filer:	Wen-Kuo Cheng/Sandy Hou
Filer Authorized By:	Wen-Kuo Cheng
Attorney Docket Number:	NC101437-US-PCT
Receipt Date:	18-SEP-2019
Filing Date:	06-NOV-2018
Time Stamp:	15:10:41
Application Type:	U.S. National Stage under 35 USC 371

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)	101437_IDS_Form.pdf	612368 f012347aa77c29677cc8a92176ccef1b9d65322b	no	4
Warnings:					

Information:					
2	Foreign Reference	FOR_1_RU2558733.pdf	5772379 02175599c8bcfbca60736afea7cf2b509696a511	no	70
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	NPL_1_RU2018142220_OA_08_08_2019.pdf	486999 709e80c06977f4cf9ae447e561d8e14383f6abdd	no	13
Warnings:					
Information:					
		Total Files Size (in bytes):	6871746		

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.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/099,421	11/06/2018	Chunli WU	NC101437-US-PCT	8013

73658 7590 10/02/2019

Nokia of America Corporation
200 South Mathilda Ave
Sunnyvale, CA 94086

EXAMINER
PATEL, HARDIKKUMAR D

ART UNIT	PAPER NUMBER
2473	

NOTIFICATION DATE	DELIVERY MODE
10/02/2019	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):

sandy.fong-hou@nokia.com
thao.pham@nokia.com

ASUS EX2019-p.287
Samsung v. ASUS
IPR2024-00614

Office Action Summary	**Application No.** 16/099,421	**Applicant(s)** WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	**Art Unit** 2473	**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 11/06/2018.

☐ 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) 29-48 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) 29-48 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 11/06/2018 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: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

2. Application was filed on 11/06/2018. Claims 29-48 are pending. Claims 1-28 are canceled.

Information Disclosure Statement

3. As required by **M.P.E.P. 609(C),** the Applicant's submission of the Information Disclosure Statement dated 11/06/2018, 02/10/2019 and 09/18/2019 are acknowledged by the Examiner and the cited references have been considered in the examination of the claims now pending. As required by **M.P.E.P. 609 C (2),** a copy of the PTOL-1449 is initialed and dated by the Examiner is attached to the Office action.

Oath/Declaration

4. The Applicant's oath/declaration received on 11/06/2018 has been reviewed and is found to conform to the requirements prescribed in **37 C.F.R. 1.63.**

Drawings

The drawings received on 11/06/2018 are acceptable for examination purposes.

Claim Rejections - 35 USC § 103

1. 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.

2. 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, 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.

3. 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 35 U.S.C. 103 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.

4. Claims 29-48 is/are rejected under 35 U.S.C. 103 as being unpatentable over Lee et a., (US 2011/0310833 A1, herein after Lee) in view of Lee et al., (US 2017/0311344 A1, herein after Lee344').

Claims 29, 35, 43,

Lee discloses an apparatus, comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, **(Fig. 12 UE having control unit...the data stored in the UE, interpreted as UE comprises memory,** ¶ [0051]) to cause the apparatus at least to receive a

configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission when there is no uplink data (**the UE may skip the UL resource allocation process that it should perform with the eNB to be allocated a UL resource ¶ [0006]… A new Explicit UL grant is allocated to the UE when no data is detected from the Explicit UL grant. And when data is detected from the Explicit UL grant ¶ [0013-0017, 0020, 0046-0054]**); and determine whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant (**The UE includes a control unit detects a type of an uplink (UL) grant while the UE is periodically allocated a UL grant…¶ [0017-0021, 0046-0052]… the UE 211 transmits the data using the Explicit UL grant in an (n+12)-th frame in step 221 ¶ [0055]**).

Lee does not explicitly disclose the apparatus is requested for UCI.

Lee344' discloses the apparatus is requested for UCI, (**the UE may non-periodically transmit the UCI through the PUSCH in accordance with request/command of the network ¶ [0043]**).

Thus, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Lee by using the features, as taught by Lee344' in order to efficiently perform D2D signal transmission/reception in a wireless communication system ¶ [0013].

Claim 29 encompass limitations that are similar to limitations of claim 35. Thus, it is rejected with the same rationale applied against claim 35 above.

Claim 43 encompass limitations that are similar to limitations of claim 35, except network node is transmitting. However Lee discloses transmitting step in fig. 2. Thus, it is rejected with the same rationale applied against claim 35 above.

Claim 46 encompass limitations that are similar to limitations of claims 35 and 39. Thus, it is rejected with the same rationale applied against claims 35 and 39 above.

Claims 30 and 36,

Lee discloses to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted **(a UL grant mapped to a FAS C-RNTI taking into account the MCS level, the transport block size…¶ [0081, 0015, 0046-0054])**.

Claim 30 encompass limitations that are similar to limitations of claim 36. Thus, it is rejected with the same rationale applied against claim 36 above.

Claims 31 and 37,

Lee discloses wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block **(the second blind scheduling scheme, when having no data to transmit on a UL, a UE transmits no padding MAC PDT/regardless of the**

type of a UL grant. In the third blind scheduling scheme, if a UE being allocated a UL grant has no data to transmit on a UL, the UE determines whether to transmit padding MAC PDUs according to the type of a Cell Radio Network Temporary Identifier (C-RNTI)… the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL ¶ [0040-0042, 0054]).

Claim 31 encompass limitations that are similar to limitations of claim 37. Thus, it is rejected with the same rationale applied against claim 37 above.

Claims 32, 38, 44 and 47,

Lee discloses the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback (**the UE transmits no padding MAC PDUs, the HARQ process between the UE and the eNB may be normally performed ¶ [0060-0066])**.

Claim 32 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claim 44 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claim 47 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claims 33 and 39,

Lee discloses the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted (**a UL grant mapped to a FAS C-RNTI taking into account the MCS level, the transport block size...when having no data to transmit using a UL grant, a UE transmits padding MAC PDUs using the UL grant, thereby causing a waste of UE battery due to the transmission of padding MAC PDUs, a signaling overhead due to the exchange of padding MAC PDUs, and a processing load due to the decoding of padding MAC PDUs by an eNB...¶ [0081, 0015, 0046-0054]**).

Claim 33 encompass limitations that are similar to limitations of claim 39. Thus, it is rejected with the same rationale applied against claim 39 above.

Claims 34, 40, 45 and 48,

Lee discloses the apparatus at least to receive the uplink grant from the network node (**Fig. 2 shows UE receiving UL grant from the enB**).

Claim 34 encompass limitations that are similar to limitations of claim 40. Thus, it is rejected with the same rationale applied against claim 40 above.

Claim 45 encompass limitations that are similar to limitations of claim 34. Thus, it is rejected with the same rationale applied against claim 34 above.

Claim 48 encompass limitations that are similar to limitations of claim 34. Thus, it is rejected with the same rationale applied against claim 34 above.

Claim 41,

Lee discloses the network node comprises a base station or evolved node B **(Fig. 2 eNB 213)**.

Claim 42,

Lee discloses wherein the apparatus comprises a user equipment **(Fig. 2 UE 211)**.

Conclusion

Examiner's Note: Examiner has cited particular paragraphs, columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and, also to verify and ascertain the metes and bounds of the Claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARDIKKUMAR D PATEL whose telephone number is (571)270-7886. The examiner can normally be reached on 9AM-5PM Monday-Friday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an

interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang B Yao can be reached on 571-272-3182. 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.

/HARDIKKUMAR D PATEL/
Examiner, Art Unit 2473

Notice of References Cited	Application/Control No. 16/099,421	Applicant(s)/Patent Under Reexamination WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	Art Unit 2473	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-20170311344-A1	10-2017	LEE; Seungmin	H04W56/00	1/1
*	B	US-20110310833-A1	12-2011	Lee; Ok-Seon	H04L1/1829	370/329
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	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.

ASUS EX2019-p.297
Samsung v. ASUS
IPR2024-00614

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	Art Unit
	HARDIKKUMAR D PATEL	2473

✓	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	09/27/2019								
	1	-								
	2	-								
	3	-								
	4	-								
	5	-								
	6	-								
	7	-								
	8	-								
	9	-								
	10	-								
	11	-								
	12	-								
	13	-								
	14	-								
	15	-								
	16	-								
	17	-								
	18	-								
	19	-								
	20	-								
	21	-								
	22	-								
	23	-								
	24	-								
	25	-								
	26	-								
	27	-								
	28	-								
	29	✓								
	30	✓								
	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								
	42	✓								

ASUS EX2019-p.298
Samsung v. ASUS
IPR2024-00614

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	Art Unit
	HARDIKKUMAR D PATEL	2473

CLAIM		DATE								
Final	Original	09/27/2019								
	43	✓								
	44	✓								
	45	✓								
	46	✓								
	47	✓								
	48	✓								

ASUS EX2019-p.299
Samsung v. ASUS
IPR2024-00614

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	Art Unit
	HARDIKKUMAR D PATEL	2473

CPC - Searched*		
Symbol	**Date**	**Examiner**
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02	09/27/2019	HDP

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**
Inventor Search - Search history print out	09/27/2019	HDP
EAST (US-PGPUB, USPAT, USOCR, EPO,) - See East Search History Print out	09/27/2019	HDP
text search only see search history	09/27/2019	HDP

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

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.300
Samsung v. ASUS
IPR2024-00614

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	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

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					

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	20110141928	A1	2011-06-16	Shin et al.	
	2	20150043352	A1	2015-02-12	Jang et al.	
	3	20110310833	A1	2011-12-22	Lee et al.	
	4	20120230232	A1	2012-09-13	Ji 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]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

	1	2802187	EP	A1	2014-11-12	Innovative Sonic Corporation		

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

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	"Open Issues For Skipping UL Grants", 3GPP TSG-RAN2 Meeting #93bis, R2-162909, Agenda item: 8.8.2, Qualcomm Incorporated, April 12-16, 2016, 2 pages.	
	2	"3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding (Release 13)", 3GPP TS 36.212, V13.1.0, March, 2016, pp. 1-129.	
	3	"3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 13)", 3GPP TS 36.213, V13.1.1, March, 2016, pp. 1-361.	
	4	"3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Further advancements for E-UTRA physical layer aspects (Release 9)", 3GPP TR 36.814, V9.0.0, March, 2010, pp. 1-104.	
	5	International Search Report and Written Opinion received for corresponding Patent Cooperation Treaty Application No. PCT/FI2017/050343, dated August 17, 2017, 16 pages.	
	6	"Report of 3GPP TSG RAN WG2 meeting #91", 3GPP TSG-RAN Working Group 2 meeting #91bis, R2-154032, Agenda Item: 2.2, ETSI MCC, October 5–9, 2015, pp. 1-163.	
	7	"Skipping Empty BSR and Feedback for SPS Activation/Deactivation", 3GPP TSG-RAN WG2 Meeting #93bis, R2-162504, Agenda item: 8.8.2, Nokia, April 11-15, 2016, 8 pages.	
	8	"Skipping Uplink Transmission With No Data to Transmit", 3GPP TSG-RAN WG2 Meeting #91, R2-153332, Agenda item: 7.11, Samsung, August 24-28, 2015, pp. 1-2.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

	9	"3rd Generation Partnership Project;Technical Specification Group Radio Access Network;Evolved Universal Terrestrial Radio Access (E-UTRA);Medium Access Control (MAC) protocol specification (Release 13) 3GPP TS 36.321 V13.1.0, March 2016, pages 33-36, 48-50 and 56-59.

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

EXAMINER SIGNATURE

Examiner Signature	/HARDIKKUMAR D PATEL/	Date Considered	09/27/2019

*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. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Application Number	
	Filing Date	
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

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	/Nico van Waes/	Date (YYYY-MM-DD)	2018-11-06
Name/Print	Nico van Waes	Registration Number	61828

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. /H.D.P/

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. /H.D.P/

ASUS EX2019-p.305
Samsung v. ASUS
IPR2024-00614

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 11:37
L2	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station) and L1	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 11:37
L3	366	(H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02).cpc. and L2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/09/27 11:39
S1	2472	((("NOKIA") near3 ("TECHNOLOGIES") near3 ("OY"))).AS,AANM.	USPAT	OR	ON	2019/09/27 07:53
S2	119	((("WU") near3 ("Chunli"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/09/27 07:53
S3	0	"2018142220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S4	0	"20181042220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S5	2	"20110310833"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S6	14040	(ue mobile terminal (user near3 equipment)) with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:06
S7	2414	(ue mobile terminal (user near3 equipment)) with request$3 with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:07
S8	1534	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:10
S9	1047	S8 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:10
S10	733	(ue mobile terminal (user near3 equipment)) with request$3 near9	US-PGPUB; USPAT; USOCR;	OR	ON	2019/09/27 10:12

ASUS EX2019-p.306
Samsung v. ASUS
IPR2024-00614

		(UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	EPO; IBM_TDB			
S11	521	S10 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S12	271	S10 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S13	194	S11 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15

EAST Search History (Interference)

< This search history is empty>

9/27/2019 11:47:29 AM
C:\Users\hpatel5\Documents\EAST\Workspaces\16099421-mthd and aprts for skipping transport blocks tx depending on UL.wsp

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	16099421
Filing Date	2018-11-06
First Named Inventor	Chunli Wu
Art Unit	2473
Examiner Name	PATEL, HARDIKKUMAR D
Attorney Docket Number	NC101437-US-PCT

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					

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	20130136053	A1	2013-05-30	Kim et al.	
	2	20140023055	A1	2014-01-23	Jeong et al.	
	3	20100111032	A1	2010-05-06	Wu	

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]	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	2558733	RU	C2	2015-08-10	Interdidzhital Pehjtent Kholdingz Ink	English abstract submitted	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16099421
Filing Date	2018-11-06
First Named Inventor	Chunli Wu
Art Unit	2473
Examiner Name	PATEL, HARDIKKUMAR D
Attorney Docket Number	NC101437-US-PCT

If you wish to add additional Foreign Patent Document citation information please click the Add button [Add]

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.	T[5]
	1	Office action received for corresponding Russian Patent Application No. 2018142220, dated August 08, 2019, 8 pages of office action and 5 pages of translation available.	X

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

EXAMINER SIGNATURE

Examiner Signature	/HARDIKKUMAR D PATEL/	Date Considered	09/27/2019

*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. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16099421
Filing Date	2018-11-06
First Named Inventor	Chunli Wu
Art Unit	2473
Examiner Name	PATEL, HARDIKKUMAR D
Attorney Docket Number	NC101437-US-PCT

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	/Nico van Waes/	Date (YYYY-MM-DD)	2019-09-18
Name/Print	Nico van Waes	Registration Number	61828

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. /H.D.P/

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. /H.D.P/

Bibliographic Data

Application No: 16/099,421

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /HARDIKKUMAR D PATEL/ Examiner's Signature | Initials

Title: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/06/2018	370	2473	NC101437-US-PCT
RULE			

APPLICANTS

Nokia Technologies Oy, Espoo, FINLAND

INVENTORS

Chunli WU Beijing, CHINA

CONTINUING DATA

This application is a 371 of PCT/FI2017/050343 05/04/2017

PCT/FI2017/050343 has PRO of 62335280 05/12/2016

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/15/2019

STATE OR COUNTRY

CHINA

ADDRESS

Nokia of America Corporation
200 South Mathilda Ave
Sunnyvale, CA 94086
UNITED STATES

FILING FEE RECEIVED

$2,040

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	16099421
Filing Date	2018-11-06
First Named Inventor	Chunli Wu
Art Unit	_
Examiner Name	_
Attorney Docket Number	NC101437-US-PCT

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					

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					

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							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

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.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16099421
	Filing Date	2018-11-06
	First Named Inventor	Chunli Wu
	Art Unit	_
	Examiner Name	_
	Attorney Docket Number	NC101437-US-PCT

	1	Office action received for corresponding Vietnam Patent Application No. 1-2018-05301, dated January 08, 2019, 1 pages of office action and 1 pages of office action translation available.	X

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

EXAMINER SIGNATURE

Examiner Signature	/HARDIKKUMAR D PATEL/	Date Considered	09/27/2019

*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. /H.D.P/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16099421
Filing Date	2018-11-06
First Named Inventor	Chunli Wu
Art Unit	_
Examiner Name	_
Attorney Docket Number	NC101437-US-PCT

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	/Nico van Waes/	Date (YYYY-MM-DD)	2018-02-10
Name/Print	Nico van Waes	Registration Number	61828

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. /H.D.P/

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. /H.D.P/

ASUS EX2019-p.316
Samsung v. ASUS
IPR2024-00614

PTO/AIA/80 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
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.

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: 10948

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: 10948

OR

☐	Firm or Individual Name			
	Address			
	City		State	Zip
	Country			
	Telephone		Email	

Assignee Name and Address: Nokia Technologies Oy
Karakaari 7, Espoo 02610, Finland

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	Mark F. Harrington	Date	12/18/2019
Name	Mark F. Harrington	Telephone	203-925-9400
Title	Attorney with General Power of Attorney (copy attached)		

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.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
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

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 10948

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Nokia Technologies Oy, Karakaari 7, 02610 Espoo, Finland

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	19-07-2019
Name	Emmanuelle Wetzel Domenico Menzietti		
Title	Director, Patents Senior Patent Counsel		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 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.

Electronic Acknowledgement Receipt

EFS ID:	38072890
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	73658
Filer:	Mark F. Harrington/Gail Conway
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	NC101437-US-PCT
Receipt Date:	18-DEC-2019
Filing Date:	06-NOV-2018
Time Stamp:	14:59:57
Application Type:	U.S. National Stage under 35 USC 371

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	Transmittal Letter	Transmittal.pdf	36312 9d1fc84599be41fb57c7060e32a06bfe2e258096	no	1
Warnings:					

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	Statement.pdf	141465 769feb86f90b9c2339ae555e0289d1e0a4c013d5	no	2
Warnings:					
Information:					
3	Power of Attorney	PowerofAttorney.pdf	193267 39e20bfc15e00e76fa9c642514bf5c1a83dc3915	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	371044	

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

Inventor(s): WU, Chunli

SERIAL NO.: 16/099421 ART UNIT: 2473

FILED: November 6, 2018 EXAMINER: Patel, Hardikkumar D

TITLE: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL TRANSMISSION

ATTORNEY DOCKET NO.: 800.2735.U1(US)

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

Submission of Power of Attorney with

Statement Under 37 C.F.R. 3.73(c)

Sir:

Attached, please find a copy of the following for the above-identified patent application:

1. Power of Attorney; and
2. Statement Under 37 C.F.R. 3.73(c).

Please change the power of attorney information and correspondence information for the patent application identified above.

Respectfully submitted,

Mark F. Harrington (Reg. No. 31,686) Date: 12/18/2019

Customer No.: 10948
Harrington & Smith, Attorneys At Law, LLC
4 Research Drive
Shelton, CT 06484-6212
203-925-9400

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. 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.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Nokia Technologies Oy

Application No./Patent No.: 16/099421 Filed/Issue Date: 11/06/2018

Titled: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION

Nokia Technologies Oy, 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 047427, Frame 0248, 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.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. 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.

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.

Mark F. Harrington — 12/18/2019

Signature — Date

Mark F. Harrington — (31,686) Attorney of Record

Printed or Typed Name — Title or Registration Number

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
16/099,421	11/06/2018	Chunli WU	NC101437-US-PCT

CONFIRMATION NO. 8013

73658
Nokia of America Corporation
200 South Mathilda Ave
Sunnyvale, CA 94086

POWER OF ATTORNEY NOTICE

OC000000113497232

Date Mailed: 12/23/2019

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/18/2019.

- 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**.

/sstephanos/

ASUS EX2019-p.324
Samsung v. ASUS
IPR2024-00614

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
16/099,421	11/06/2018	Chunli WU	NC101437-US-PCT

CONFIRMATION NO. 8013

10948
Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

POA ACCEPTANCE LETTER

OC000000113497242

Date Mailed: 12/23/2019

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/18/2019.

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**.

/sstephanos/

ASUS EX2019-p.325
Samsung v. ASUS
IPR2024-00614

Electronic Acknowledgement Receipt

EFS ID:	38180106
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Elaine Mian
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	02-JAN-2020
Filing Date:	06-NOV-2018
Time Stamp:	09:38:40
Application Type:	U.S. National Stage under 35 USC 371

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	Amendment Copy Claims/Response to Suggested Claims	Response-01-02-2020.pdf	215565 04279f296fd96333473f2c177f37785e9374359e	no	9

Warnings:

Information:	
Total Files Size (in bytes):	215565

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 U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1 (US)
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

RESPONSE TO OFFICE ACTION

SIR:

This is submitted in response to the Office Action of October 2, 2019 on the above-identified application. It is being submitted prior to the close of the shortened statutory period for response set in the action. As such, no extension of time is believed to be necessary. In the event that the undersigned attorney is mistaken on this point, please consider this to be a petition for an extension of time, and charge Deposit Account No. 50-1924 for the fee required under 37 C.F.R. §1.17(a).

Please amend the application as shown below.

AMENDMENTS TO THE CLAIMS:

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

Listing of Claims:

1. to 28. (Canceled)

29. (Currently amended) A method[[,]] comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission for an uplink grant when there is no uplink data; and

determining whether the user equipment is requested for uplink control information transmission for a subframe with the uplink grant.

30. (Previously presented) The method according to claim 29, wherein, when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with uplink grant, generating a transport block regardless of whether there is uplink data to be transmitted.

31. (Previously presented) The method according to claim 29, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, skipping generating a transport block.

32. (Currently amended) The method according to claim 29, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator [[or]] and hybrid automatic repeat request feedback.

ASUS EX2019-p.329
Samsung v. ASUS
IPR2024-00614

33. (Currently amended) The method according to ~~claims~~ claim 29, further comprising transmitting a transport block to the network node regardless of whether there is uplink data to be transmitted.

34. (Previously presented) The method according to claim 29, further comprising receiving the uplink grant from the network node.

35. (Currently amended) An apparatus[[,]] comprising:

at least one processor; and

at least one memory including computer program code,[[;]] the at least one memory and the computer program code ~~are~~ being configured, with the at least one processor, to cause the apparatus at least to:

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission for an uplink grant when there is no uplink data; and

determine whether the apparatus is requested for uplink control information transmission for a subframe with the uplink grant.

36. (Currently amended) The apparatus according to claim 35, wherein, when it is determined that the apparatus is requested for the uplink control information transmission for the subframe with uplink grant, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted.

37. (Currently amended) The apparatus according to claim 35, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer

ASUS EX2019-p.330
Samsung v. ASUS
IPR2024-00614

status report only protocol data unit, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

38. (Currently amended) The apparatus according to claim 35, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator [[or]] and hybrid automatic repeat request feedback.

39. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted.

40. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

41. (Previously presented) The apparatus according to claim 35, wherein the network node comprises a base station or evolved node B.

42. (Previously presented) The apparatus according to claim 35, wherein the apparatus comprises a user equipment.

43. (Currently amended) A method[[,]] comprising:

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

ASUS EX2019-p.331
Samsung v. ASUS
IPR2024-00614

receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

44. (Currently amended) The method according to claim 43, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator [[or]] and hybrid automatic repeat request feedback.

45. (Previously presented) The method according to claim 43, further comprising transmitting uplink grant to the at least one user equipment.

46. (Currently amended) An apparatus[[,]] comprising:

at least one processor; and

at least one memory including computer program code,[[;]] the at least one memory and the computer program code ~~are~~ being configured, with the at least one processor, to cause the apparatus at least to:

transmit a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receive, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

47. (Currently amended) The apparatus according to claim 46, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator [[or]] and hybrid automatic repeat request feedback.

ASUS EX2019-p.332
Samsung v. ASUS
IPR2024-00614

48. (Currently amended) The apparatus according to claim 46, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit uplink grant to the at least one user equipment.

ASUS EX2019-p.333
Samsung v. ASUS
IPR2024-00614

REMARKS

This is submitted in response to the Office Action of October 2, 2019 on the above-identified application. Reconsideration of the claims as amended above, in view of the comments to follow, is respectfully requested.

Claims 29 to 48 are pending in the application. In the action, all claims were rejected on the basis of the prior art.

Specifically, all claims were rejected under 35 U.S.C. §103 as being unpatentable for obviousness over U.S. Publication No. US 2011/0310833 A1 to Lee et al. (hereinafter Lee) in view of U.S. Publication No. US 2017/0311344 A1 to Lee et al. (hereinafter Lee '344).

The Examiner will note that, in the preceding amendments, independent claims 29, 35, 43, and 46 have been amended to clarify the subject matter believed to be patentable over the cited prior art. Entry of the amendments is respectfully requested.

According to the present subject matter, as exemplified by independent claim 29, that claim is concerned with receiving, by a user equipment, a configuration of skipping uplink transmission for an uplink grant when there is no uplink data, and determining whether to still use a subframe with the uplink grant to transmit uplink control information although it is configured to skip the UL transmission.

All claims, including independent claims 29, 35, 43, and 46, were rejected as being unpatentable for obviousness over Lee in view of Lee '344.

Lee discloses a system and a method which are said to minimize power consumption, signaling overhead, and processing load in blind scheduling in a mobile communication system. A user equipment (UE) detects a type of an uplink (UL) grant while it is periodically allocated the UL grant. If there is no data to transmit using the UL grant, the UE determines whether to transmit a padding Medium Access Control (MAC) Protocol Data Unit (PDU) to an Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Node B (eNB) using the UL grant according to the type of the UL grant.

In Lee, if there is no UL data, the eNB may allocate a new grant to the UE, and send HARQ to the UE.

ASUS EX2019-p.334
Samsung v. ASUS
IPR2024-00614

However, in Lee, there is neither sending uplink control information by the UE, nor determining whether to send it using the subframe with the uplink grant, although it is configured to skip the uplink transmission.

Lee '344 relates to a method and apparatus for monitoring a downlink control channel by a first terminal having a single RX chain in a wireless communication system. Specifically, the disclosed invention comprises the steps of: setting a particular gap for a resource area related to device-to-device (D2D) signal transmission/reception; and monitoring a wide area network (WAN) communication-based downlink control channel on the basis of a timer performed according to a discontinuous reception (DRX) operation, wherein the timer is counted on the basis of at least one subframe which does not overlap with the particular gap, and the particular gap is a time interval set for allowing the single RX chain to cover a switching operation between WMN communication and D2D communication.

In the paragraphs to which the Examiner has referred, Lee '344 discusses transmitting uplink control information (UCI), stating that UCI is generally transmitted through PUCCH, and may be also transmitted through PUSCH if control information and traffic data should be transmitted at the same time. Also, UCI may be non-periodically transmitted through PUSCH in accordance with request/command from the network (see paragraph [0043]).

Lee '344 is also silent about determining whether to send UCI using the subframe with **the** uplink grant, **although it is configured to skip the uplink transmission**. On the contrary, Lee '344 mentions only a scenario in which control information **and** traffic data should be transmitted at the same time, that is, the uplink grant is not skipped.

As a consequence, independent claims 29, 35, 43, and 46 are respectfully submitted to be patentable over the combined teachings of Lee and Lee '344, as are the dependent claims, which further limit the subject matter claimed in their respective independent base claims.

ASUS EX2019-p.335
Samsung v. ASUS
IPR2024-00614

In view of the above, reconsideration of claims 29 to 48, as amended, is respectfully requested, and their early allowance is earnestly sought.

Respectfully submitted,

John F. Gulbin — January 2, 2020

John F. Gulbin
Registration No. 33,180

Date

Customer No.: 10948

HARRINGTON & SMITH, ATTORNEYS AT LAW, LLC
4 Research Drive
Shelton, CT 06484-6212

Telephone: (203) 925-9400 ext. 15
Facsimile: (203) 944-0245
E-mail: jgulbin@hspatent.com

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or is being transmitted electronically to the United States Patent and Trademark Office.

Elaine F. Mian — 1/2/2020

Name of Person Making Deposit

Date

ASUS EX2019-p.336
Samsung v. ASUS
IPR2024-00614

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. 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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/099,421	Filing Date 11/06/2018	☐ 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	01/02/2020	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	*** 4	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(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".	/JACQUELYN L WILLIAMS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Chunli Wu CONF. NO.: 8013

SERIAL NO.: 16/099,421 ART UNIT: 2473

FILED: November 6, 2018 EXAMINER: Hardikkumar D. Patel

TITLE: Methods and Apparatues for Skipping Transport Block Transmission Depending on Uplink Control Information Transmission

ATTORNEY DOCKET NO.: 800.2735.U1(US)

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

Information Disclosure Statement
(37 C.F.R. §1.97(c))

Sir:

The following information is being disclosed to the U.S. Patent and Trademark Office as information that may be material to the examination of the above-identified patent application.

The enclosed Form PTO-1449 lists documents cited in an Office Action issued in the corresponding Korean Patent Application No. 2018-7035878, dated December 23, 2019. Also enclosed is a copy of the Korean Office Action.

☒ Each item of information contained in this Information Disclosure Statement was cited in a communication from a

ASUS EX2019-p.338
Samsung v. ASUS
IPR2024-00614

foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement, or

☐ No item of information contained in this 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 statement after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this Statement.

The filing of this Statement is not to be construed as a representation that a search has been made regarding the claimed invention (37 C.F.R. §1.97(g)) or that no other possible material information exists. In addition, the filing of this Statement is not to be construed to be an admission that the information cited in the Statement is, or is considered to be, material to patentability (37 C.F.R. §1.97(h)).

Respectfully submitted,

John F. Gulbin _____ January 3, 2020

John F. Gulbin (Reg. No. 33,180) Date

Customer No.: 10948
Harrington & Smith, Attorneys At Law, LLC
4 Research Drive
Shelton, CT 06484-6212
203-925-9400

ASUS EX2019-p.339
Samsung v. ASUS
IPR2024-00614

INFORMATION DISCLOSURE CITATION FORM FOR PATENT APPLICATION (FORM PTO-1449) (Substitute)	Docket No.: 800.2735.U1(US)	Serial No.: 16/099,421
	Applicant(s): Chunli Wu	
	Filing Date: November 6, 2018	Group: 2473

U.S. PATENT DOCUMENTS

Examiner Initials	Document Number (Number-Kind Code)	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant	Class	Sub-class
	US-2013/0034028 A1	02-07-2013	Chen et al.	370	280
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				

FOREIGN PATENT DOCUMENTS

Examiner Initials	Document Number (Country Code-Number-Kind Code)	Publication Date (MM-DD-YYYY)	Name Of Patentee of Applicant	Translation? Yes/No/n/a
	KR-2014/0043148 A	04-08-2014	Qualcomm Incorporated	
	- -			
	- -			
	- -			
	- -			
	- -			

OTHER DOCUMENTS (Author (Capitalize), Title, Date, Pages, Etc., if known)

	"Considerations on skipping UL padding transmissions", Sequans Communications, 3GPP TSG-RAN WG2 #93bis, R2-162735, April 2016, 7 pages

Examiner's Signature:	Date Considered:

Initial if reference was considered, whether or not citation is in conformance with MPEP. Mark through citation if not considered. Include a copy of this citation form with your next correspondence to the Applicant(s).

Electronic Acknowledgement Receipt

EFS ID:	38272646
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Elaine Mian
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	13-JAN-2020
Filing Date:	06-NOV-2018
Time Stamp:	09:43:42
Application Type:	U.S. National Stage under 35 USC 371

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	Other Reference-Patent/App/Search documents	KROfficeAction-12-23-2020.pdf	591448 59b07106f739953ad6a308edc09b49f5f97fd58d	no	10
Warnings:					

Information:					
2	Foreign Reference	KR20140043148.pdf	1965360 131faa9461b7632a398cbce920d5ff4d00fcb298	no	30
Warnings:					
Information:					
3	Non Patent Literature	R2-162735.pdf	143014 a59944c8c8075c50d0f26070b68da0d4235e8ce3	no	7
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	IDS-01-13-2020.pdf	82568 5bb972c22f38aa81cc70338258f1fca00fbfae93	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
		Total Files Size (in bytes):	2782390		

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.

Espacenet

Bibliographic data: KR20140043148 (A) — 2014-04-08

ALLOCATING PHYSICAL HYBRID ARQ INDICATOR CHANNEL (PHICH) RESOURCES

Inventor(s): CHEN WANSHI [CN]; DAMNJANOVIC JELENA M [US]; MONTOJO JUAN [US] ± (CHEN WANSHI, ; DAMNJANOVIC JELENA M, ; MONTOJO JUAN, ; 첸, 완시, ; 담자노빅, 제레나 엠., ; 몬토조, 주안)

Applicant(s): QUALCOMM INC [US] ± (QUALCOMM INCORPORATED, ; 퀄컴 인코포레이티드)

Classification: - international: *H04L1/18; H04L5/00*
- cooperative: H04L1/18 (KR); H04L1/1854 (EP, US); H04L1/1861 (EP, US); H04L5/001 (EP, US); H04L5/0053 (KR); H04L5/0055 (EP, US)

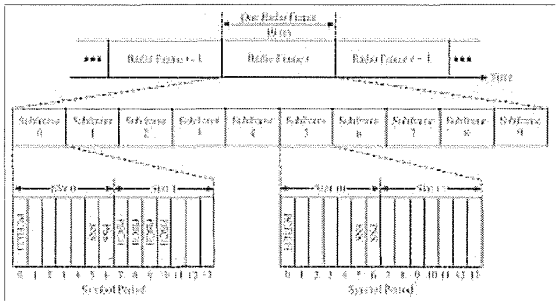
Application number: KR20147004899 20120803 Global Dossier

Priority number (s): US201213565704 20120802 ; US201161514757P 20110803 ; WO2012US49444 20120803

Also published as: BR112014002148 (A2) CA2842702 (A1) CA2842702 (C) CN103828284 (A) CN103828284 (B) more

Abstract not available for KR20140043148 (A)
Abstract of corresponding document: US2013034028 (A1)

Certain aspects of the present disclosure relate to techniques for allocating resources for Physical Hybrid Automatic Repeat Request (HARQ) Indicator Channel (PHICH).



ASUS EX2019-p.343
Samsung v. ASUS
IPR2024-00614

(19) 대한민국특허청(KR)
(12) 공개특허공보(A)

(11) 공개번호 10-2014-0043148
(43) 공개일자 2014년04월08일

(51) 국제특허분류(Int. Cl.)
H04L 1/18 (2006.01) *H04L 5/00* (2006.01)
(21) 출원번호 10-2014-7004899
(22) 출원일자(국제) 2012년08월03일
심사청구일자 2014년02월25일
(85) 번역문제출일자 2014년02월25일
(86) 국제출원번호 PCT/US2012/049444
(87) 국제공개번호 WO 2013/020012
국제공개일자 2013년02월07일
(30) 우선권주장
13/565,704 2012년08월02일 미국(US)
61/514,757 2011년08월03일 미국(US)

(71) 출원인
퀄컴 인코포레이티드
미국 92121-1714 캘리포니아주 샌 디에고 모어하우스 드라이브 5775
(72) 발명자
첸, 완시
미국 92121 캘리포니아주 샌 디에고 모어하우스 드라이브 5775
담자노빅, 제레나 엠.
미국 92121 캘리포니아주 샌 디에고 모어하우스 드라이브 5775
몬토조, 주안
미국 92121 캘리포니아주 샌 디에고 모어하우스 드라이브 5775
(74) 대리인
특허법인 남앤드남

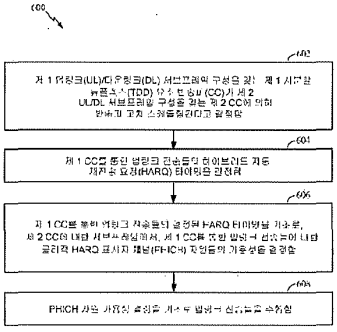
전체 청구항 수 : 총 42 항

(54) 발명의 명칭 **물리적 하이브리드 ARQ 표시자 채널(PHICH) 자원들의 할당**

(57) 요 약

본 개시의 특정 양상들은 물리적 하이브리드 자동 재전송 요청(HARQ) 표시자 채널(PHICH)에 대한 자원들을 할당하기 위한 기술들에 관한 것이다.

대 표 도 - 도6



ASUS EX2019-p.344
Samsung v. ASUS
IPR2024-00614

특허청구의 범위

청구항 1

무선 통신을 위한 방법으로서,

제 1 업링크(UL: uplink)/다운링크(DL: downlink) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD: Time division duplex) 요소 반송파(CC: Component Carrier)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하는 단계;

상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ: Hybrid Automatic Repeat Request) 타이밍을 결정하는 단계;

상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH: Physical HARQ Indicator Channel) 자원들의 가용성을 결정하는 단계; 및

PHICH 자원 가용성 결정을 기초로 상기 제 1 CC에 대한 서브프레임에서 업링크 전송을 수행하는 단계를 포함하는,

무선 통신을 위한 방법.

청구항 2

제 1 항에 있어서,

업링크 전송들의 HARQ 응답들을 위해 상기 제 2 CC의 적어도 하나의 다운링크 서브프레임에서 상기 PHICH에 대해 정상인 경우보다 추가적인 자원들을 확보하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 3

제 2 항에 있어서,

상기 PHICH에 대한 상기 추가적인 자원들은 다운링크 채널 자원들의 일부를 재사용함으로써 확보되는,

무선 통신을 위한 방법.

청구항 4

제 2 항에 있어서,

상기 PHICH에 대한 상기 추가적인 자원들은 다운링크 데이터 자원들의 일부를 재사용함으로써 확보되는,

무선 통신을 위한 방법.

청구항 5

제 1 항에 있어서,

상기 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 상기 제 2 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 6

제 5 항에 있어서,

상기 제 2 CC에서의 업링크 서브프레임들의 세트는 상기 제 1 TDD CC에서의 업링크 서브프레임들의 세트의 서브세트인,

ASUS EX2019-p.345
Samsung v. ASUS
IPR2024-00614

무선 통신을 위한 방법.

청구항 7

제 5 항에 있어서,

상기 제 2 CC에서의 업링크 서브프레임들의 세트는 상기 제 1 TDD CC에서의 상기 업링크 서브프레임들의 세트의 수퍼세트인,

무선 통신을 위한 방법.

청구항 8

제 1 항에 있어서,

상기 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 상기 제 1 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 9

제 1 항에 있어서,

상기 PHICH 자원이 이용 가능하다고 결정되고,

상기 방법은,

상기 결정에 응답하여, 결정된 PHICH 자원을 기초로 HARQ 응답을 결정하는 단계를 포함하는,

무선 통신을 위한 방법.

청구항 10

제 9 항에 있어서,

상기 HARQ 응답은 부정 응답이라고 결정되고,

상기 방법은,

상기 결정에 응답하여 비-적응적 업링크 데이터 전송을 수행하는 단계를 포함하는,

무선 통신을 위한 방법.

청구항 11

제 1 항에 있어서,

PHICH 자원들이 이용 불가능하다는 결정에 응답하여 업링크 데이터 전송을 보류하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 12

제 1 항에 있어서,

상기 PHICH 자원은 이용 불가능하다고 결정되고,

상기 방법은,

업링크 승인을 스케줄링하는 다운링크 제어 채널을 검출하는 단계, 및

상기 업링크 승인에 응답하여 업링크 데이터 전송을 수행하는 단계를 포함하는,

무선 통신을 위한 방법.

청구항 13

ASUS EX2019-p.346
Samsung v. ASUS
IPR2024-00614

제 1 항에 있어서,

상기 제 2 CC는 주파수 분할 듀플렉스(FDD: Frequency Division Duplex) 반송파와 TDD 반송파 중 적어도 하나를 포함하는,

무선 통신을 위한 방법.

청구항 14

무선 통신을 위한 장치로서,

제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플랙스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하기 위한 수단;

상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하기 위한 수단;

상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하기 위한 수단; 및

PHICH 자원 가용성 결정을 기초로 상기 제 1 CC에 대한 서브프레임에서 업링크 전송을 수행하기 위한 수단을 포함하는,

무선 통신을 위한 장치.

청구항 15

제 14 항에 있어서,

업링크 전송들의 HARQ 응답들을 위해 상기 제 2 CC의 적어도 하나의 다운링크 서브프레임에서 상기 PHICH에 대해 정상인 경우보다 추가적인 자원들을 확보하기 위한 수단을 더 포함하는,

무선 통신을 위한 장치.

청구항 16

제 15 항에 있어서,

상기 PHICH에 대한 상기 추가적인 자원들은 다운링크 채널 자원들의 일부를 재사용함으로써 확보되는,

무선 통신을 위한 장치.

청구항 17

제 15 항에 있어서,

상기 PHICH에 대한 상기 추가적인 자원들은 다운링크 데이터 자원들의 일부를 재사용함으로써 확보되는,

무선 통신을 위한 방법.

청구항 18

제 14 항에 있어서,

상기 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 상기 제 2 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정하기 위한 수단을 더 포함하는,

무선 통신을 위한 장치.

청구항 19

제 18 항에 있어서,

상기 제 2 CC에서의 업링크 서브프레임들의 세트는 상기 제 1 TDD CC에서의 업링크 서브프레임들의 세트의 서브세트인,

ASUS EX2019-p.347
Samsung v. ASUS
IPR2024-00614

무선 통신을 위한 장치.

청구항 20

제 18 항에 있어서,

상기 제 2 CC에서의 업링크 서브프레임들의 세트는 상기 제 1 TDD CC에서의 상기 업링크 서브프레임들의 세트의 수퍼세트인,

무선 통신을 위한 장치.

청구항 21

제 14 항에 있어서,

상기 PHICH 자원들의 가용성을 결정하기 위한 수단은, 상기 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 상기 제 1 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정하는,

무선 통신을 위한 장치.

청구항 22

제 14 항에 있어서,

상기 PHICH 자원들의 가용성을 결정하기 위한 수단은, 상기 PHICH 자원이 이용 가능하다고 결정하고,

상기 장치는,

결정된 PHICH 자원을 기초로 HARQ 응답을 결정하기 위한 수단을 포함하는,

무선 통신을 위한 장치.

청구항 23

제 22 항에 있어서,

상기 HARQ 응답은 부정 응답이라고 결정되고,

상기 장치는,

상기 결정에 응답하여 비-적응적 업링크 데이터 전송을 수행하기 위한 수단을 포함하는,

무선 통신을 위한 장치.

청구항 24

제 14 항에 있어서,

PHICH 자원들이 이용 불가능하다는 결정에 응답하여 업링크 데이터 전송을 보류하기 위한 수단을 더 포함하는,

무선 통신을 위한 장치.

청구항 25

제 14 항에 있어서,

상기 PHICH 자원은 이용 불가능하다고 결정되고,

상기 장치는,

업링크 승인을 스케줄링하는 다운링크 제어 채널을 검출하기 위한 수단, 및

상기 업링크 승인에 응답하여 업링크 데이터 전송을 수행하기 위한 수단을 포함하는,

무선 통신을 위한 장치.

ASUS EX2019-p.348
Samsung v. ASUS
IPR2024-00614

청구항 26

제 14 항에 있어서,

상기 제 2 CC는 주파수 분할 듀플렉스(FDD) 반송파와 TDD 반송파 중 적어도 하나를 포함하는,

무선 통신을 위한 장치.

청구항 27

무선 통신을 위한 장치로서,

제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하고, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하고, 상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하고, 그리고 PHICH 자원 가용성 결정을 기초로 상기 제 1 CC에 대한 서브프레임에서 업링크 전송을 수행하도록 구성된, 적어도 하나의 프로세서; 및

상기 적어도 하나의 프로세서에 연결된 메모리를 포함하는,

무선 통신을 위한 장치.

청구항 28

무선 통신을 위한 컴퓨터 프로그램 물건으로서,

제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하기 위한 코드;

상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하기 위한 코드;

상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하기 위한 코드; 및

PHICH 자원 가용성 결정을 기초로 상기 제 1 CC에 대한 서브프레임에서 업링크 전송을 수행하기 위한 코드를 포함하는,

컴퓨터 판독 가능 매체를 포함하는,

무선 통신을 위한 컴퓨터 프로그램 물건.

청구항 29

무선 통신을 위한 방법으로서,

UE에 대해, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC) 및 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC를 구성하는 단계 – 상기 제 1 CC는 상기 제 2 CC에 의해 반송파 교차 스케줄링됨 –;

상기 UE에 대해, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하는 단계;

상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하는 단계; 및

상기 PHICH 자원 가용성 결정을 기초로 상기 UE에 대해, 상기 제 1 CC에 대한 서브프레임에 대해 업링크 스케줄링 동작을 수행하는 단계를 포함하는,

무선 통신을 위한 방법.

ASUS EX2019-p.349
Samsung v. ASUS
IPR2024-00614

청구항 30

제 29 항에 있어서,

업링크 전송들의 HARQ 응답들을 위해 상기 제 2 CC의 적어도 하나의 다운링크 서브프레임에서 상기 PHICH에 대해 정상인 경우보다 추가적인 자원들을 확보하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 31

제 29 항에 있어서,

상기 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 상기 제 2 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 32

제 29 항에 있어서,

상기 PHICH 자원들이 이용 불가능하다는 결정에 응답하여 상기 UE에 대한 대응하는 업링크 데이터 전송이 보류된다고 결정하는 단계를 더 포함하는,

무선 통신을 위한 방법.

청구항 33

제 29 항에 있어서,

상기 PHICH 자원은 이용 불가능하다고 결정되고,

상기 방법은,

상기 UE에 대한 업링크 승인을 스케줄링하는 다운링크 제어 채널을 전송하는 단계를 포함하는,

무선 통신을 위한 방법.

청구항 34

제 29 항에 있어서,

상기 제 2 CC는 주파수 분할 듀플렉스(FDD) 반송파와 TDD 반송파 중 적어도 하나를 포함하는,

무선 통신을 위한 방법.

청구항 35

무선 통신을 위한 장치로서,

UE에 대해, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC) 및 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC를 구성하기 위한 수단 - 상기 제 1 CC는 상기 제 2 CC에 의해 반송파 교차 스케줄링됨 -;

상기 UE에 대해, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하기 위한 수단;

상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하기 위한 수단; 및

상기 PHICH 자원 가용성 결정을 기초로 상기 UE에 대해, 상기 제 1 CC에 대한 서브프레임에 대해 업링크 스케줄링 동작을 수행하기 위한 수단을 포함하는,

ASUS EX2019-p.350
Samsung v. ASUS
IPR2024-00614

무선 통신을 위한 장치.

청구항 36

제 35 항에 있어서,

업링크 전송들의 HARQ 응답들을 위해 상기 제 2 CC의 적어도 하나의 다운링크 서브프레임에서 상기 PHICH에 대해 정상인 경우보다 추가적인 자원들을 확보하기 위한 수단을 더 포함하는,

무선 통신을 위한 장치.

청구항 37

제 35 항에 있어서,

상기 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 상기 제 2 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정하기 위한 수단을 더 포함하는,

무선 통신을 위한 장치.

청구항 38

제 35 항에 있어서,

상기 PHICH 자원들이 이용 불가능하다는 결정에 응답하여 상기 UE에 대한 대응하는 업링크 데이터 전송이 보류된다고 결정하기 위한 수단을 더 포함하는,

무선 통신을 위한 장치.

청구항 39

제 35 항에 있어서,

상기 PHICH 자원은 이용 불가능하다고 결정되고,

상기 방법은,

상기 UE에 대한 업링크 승인을 스케줄링하는 다운링크 제어 채널을 전송하는 단계를 포함하는,

무선 통신을 위한 장치.

청구항 40

제 35 항에 있어서,

상기 제 2 CC는 주파수 분할 듀플렉스(FDD) 반송파와 TDD 반송파 중 적어도 하나를 포함하는,

무선 통신을 위한 장치.

청구항 41

무선 통신을 위한 장치로서,

UE에 대해, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC) 및 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC를 구성하고, - 상기 제 1 CC는 상기 제 2 CC에 의해 반송파 교차 스케줄링됨 -, 상기 UE에 대해, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하고, 상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하고, 그리고 상기 PHICH 자원 가용성 결정을 기초로 상기 UE에 대해, 상기 제 1 CC에 대한 서브프레임에 대해 업링크 스케줄링 동작을 수행하도록 구성된, 적어도 하나의 프로세서; 및

상기 적어도 하나의 프로세서와 연결된 메모리를 포함하는,

무선 통신을 위한 장치.

ASUS EX2019-p.351
Samsung v. ASUS
IPR2024-00614

청구항 42

무선 통신을 위한 컴퓨터 프로그램 물건으로서,

UE에 대해, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC) 및 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC를 구성하기 위한 코드 - 상기 제 1 CC는 상기 제 2 CC에 의해 반송파 교차 스케줄링됨 -;

상기 UE에 대해, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하기 위한 코드;

상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하기 위한 코드; 및

상기 PHICH 자원 가용성 결정을 기초로 상기 UE에 대해, 상기 제 1 CC에 대한 서브프레임에 대해 업링크 스케줄링 동작을 수행하기 위한 코드를 포함하는,

컴퓨터 판독 가능 매체를 포함하는,

무선 통신을 위한 컴퓨터 프로그램 물건.

명세서

기술분야

[0001] 본 출원은 2011년 8월 3일자 제출된 미국 가출원 일련번호 제61/514,757호에 대한 우선권을 주장하며, 이 가출원의 개시는 그 전체가 인용에 의해 본 명세서에 명백히 포함된다.

[0002] 본 개시의 특정 양상들은 일반적으로 무선 통신들에 관한 것으로, 보다 구체적으로는 물리적 하이브리드 자동 재전송 요청(HARQ) 표시자 채널(PHICH: Physical Hybrid Automatic Repeat Request (HARQ) Indicator Channel)에 대한 자원들을 할당하기 위한 기술들에 관한 것이다.

배경기술

[0003] 무선 통신 시스템들은 전화, 비디오, 데이터, 메시징 및 브로드캐스트들과 같은 다양한 통신 서비스들을 제공하도록 폭넓게 전개된다. 일반적인 무선 통신 시스템들은 이용 가능한 시스템 자원들(예를 들어, 대역폭, 송신 전력)을 공유함으로써 다수의 사용자들과의 통신을 지원할 수 있는 다중 액세스 기술들을 이용할 수 있다. 이러한 다중 액세스 기술들의 예들은 코드 분할 다중 액세스(CDMA: code division multiple access) 시스템들, 시분할 다중 액세스(TDMA: time division multiple access) 시스템들, 주파수 분할 다중 액세스(FDMA: frequency division multiple access) 시스템들, 직교 주파수 분할 다중 액세스(OFDMA: orthogonal frequency division multiple access) 시스템들, 단일 반송파 주파수 분할 다중 액세스(SC-FDMA: single-carrier frequency divisional multiple access) 시스템들, 및 시분할 동기식 코드 분할 다중 액세스(TD-SCDMA: time division synchronous code division multiple access) 시스템들을 포함한다.

[0004] 이러한 다중 액세스 기술들은 도시, 국가, 지방 그리고 심지어 전세계 레벨 상에서 서로 다른 무선 디바이스들이 통신할 수 있게 하는 공통 프로토콜을 제공하도록 다양한 통신 표준들에 채택되어 왔다. 최근에 부상한 통신 표준의 일례는 롱 텀 에볼루션(LTE: Long Term Evolution)이다. LTE는 3세대 파트너십 프로젝트(3GPP: Third Generation Partnership Project)에 의해 반포된 범용 모바일 통신 시스템(UMTS: Universal Mobile Telecommunications System) 모바일 표준에 대한 확장(enhancement)들의 한 세트이다. LTE는 스펙트럼 효율을 개선함으로써 모바일 광대역 인터넷 액세스를 더욱 잘 지원하고, 비용들을 낮추며, 서비스들을 개선하고, 새로운 스펙트럼을 이용하며, 다운링크(DL: downlink) 상에서 OFDMA를, 업링크(UL: uplink) 상에서 SC-FDMA를, 그리고 다중 입력 다중 출력(MIMO: multiple-input multiple-output) 안테나 기술을 사용하여 다른 개방형 표준들과 더욱 잘 통합하도록 설계된다. 그러나 모바일 광대역 액세스에 대한 요구가 계속해서 증가함에 따라, LTE 기술에 있어 추가적인 개선들에 대한 필요성이 존재한다. 가급적, 이러한 개선들은 다른 다중 액세스 기술들 및 이러한 기술들을 이용하는 통신 표준들에 적용 가능해야 한다.

ASUS EX2019-p.352
Samsung v. ASUS
IPR2024-00614

발명의 내용

[0005] 본 개시의 특정 양상들은 무선 통신을 위한 방법들을 제공한다. 이 방법은 일반적으로, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD: Time division duplex) 요소 반송파(CC: Component Carrier)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하는 단계, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하는 단계, 상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하는 단계, 및 HARQ 자원 가용성 결정을 기초로 업링크 전송들을 수행하는 단계를 포함한다.

[0006] 본 개시의 특정 양상들은 무선 통신을 위한 장치들을 제공한다. 이 장치는 일반적으로, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하기 위한 수단, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하기 위한 수단, 상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하기 위한 수단, 및 HARQ 자원 가용성 결정을 기초로 업링크 전송들을 수행하기 위한 수단을 포함한다.

[0007] 본 개시의 특정 양상들은 무선 통신을 위한 장치들을 제공한다. 이 장치는 일반적으로, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하고, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하고, 상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하고, 그리고 HARQ 자원 가용성 결정을 기초로 업링크 전송들을 수행하도록 구성된 적어도 하나의 프로세서를 포함한다. 이 장치는 상기 적어도 하나의 프로세서에 연결된 메모리를 더 포함한다.

[0008] 본 개시의 특정 양상들은 무선 통신을 위한 컴퓨터 프로그램 물건들을 제공한다. 컴퓨터 프로그램 물건은 일반적으로, 코드를 포함하는 컴퓨터 판독 가능 매체를 포함한다. 코드는 일반적으로, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정하기 위한 코드, 상기 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정하기 위한 코드, 상기 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 상기 제 2 CC에 대한 서브프레임에서, 상기 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정하기 위한 코드, 및 HARQ 자원 가용성 결정을 기초로 업링크 전송들을 수행하기 위한 코드를 포함한다.

[0009] 본 개시의 다양한 양상들 및 특징들이 뒤에 더 상세히 설명된다.

도면의 간단한 설명

[0010] 도 1은 본 개시의 특정 양상들에 따른 무선 통신 네트워크의 일례를 개념적으로 나타내는 블록도이다.

도 2는 본 개시의 특정 양상들에 따른 무선 통신 네트워크의 프레임 구조의 일례를 개념적으로 나타내는 블록도이다.

도 2a는 본 개시의 특정 양상들에 따른 롱 텀 에볼루션(LTE)에서의 업링크에 대한 예시적인 포맷을 보여준다.

도 3은 본 개시의 특정 양상들에 따라, 무선 통신 네트워크에서 사용자 장비 디바이스(UE)와 통신하는 노드 B의 일례를 개념적으로 나타내는 블록도를 보여준다.

도 4는 본 개시의 특정 양상들에 따라, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파에 대한 예시적인 PHICH 자원 맵핑(400)을 나타낸다.

도 5는 본 개시의 특정 양상들에 따라, 주파수 분할 듀플렉스(FDD: Frequency Division Duplex) 다운링크 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(500)을 나타낸다.

도 6은 본 개시의 특정 양상들에 따라, 물리적 하이브리드 ARQ 표시자 채널(PHICH)의 할당을 위한 예시적인 동

ASUS EX2019-p.353
Samsung v. ASUS
IPR2024-00614

작들(600)을 나타낸다. 도 6a는 본 개시의 특정 양상들에 따른 예시적인 블록도이다.

도 7은 본 개시의 특정 양상들에 따라, 물리적 하이브리드 ARQ 표시자 채널(PHICH)의 할당을 위한 예시적인 동작들(700)을 나타낸다. 도 7a는 본 개시의 특정 양상들에 따른 예시적인 블록도이다.

도 8은 본 개시의 특정 양상들에 따라, PHICH 및 PDCCH를 기반으로 서브프레임들의 보류, 재전송 또는 새로운 전송을 결정하기 위한 예시적인 표(800)를 나타낸다.

도 9a는 본 개시의 특정 양상들에 따라, 주파수 분할 듀플렉스(FDD) 다운링크 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(900A)에 대한 HARQ 타임라인의 변경을 나타낸다.

도 9b는 본 개시의 특정 양상들에 따라, 주파수 분할 듀플렉스(FDD) 다운링크 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(900B)에 대한 HARQ 타임라인의 변경을 나타낸다.

도 10은 본 개시의 특정 양상들에 따라, UL/DL 서브프레임 구성 1을 갖는 다른 TDD 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(1000)에 대한 HARQ 타임라인의 변경을 나타낸다.

도 11은 7개의 LTE TDD UL/DL 서브프레임 구성들에 대한 m_i의 값을 나타낸다.

도 12는 본 개시의 특정 양상들에 따라, UL/DL 서브프레임 구성 2를 갖는 TDD 반송파에 의한, UL/DL 서브프레임 구성 1을 갖는 TDD 반송파의 교차 스케줄링을 나타낸다.

도 13은 UL/DL 서브프레임 구성 2를 갖는 TDD 반송파에 의한, UL/DL 서브프레임 구성 1을 갖는 TDD 반송파의 교차 스케줄링을 나타내며, 여기서는 본 개시의 특정 양상들에 따라 서브프레임 3과 서브프레임 8에 대해 추가 PHICH 자원이 할당된다.

발명을 실시하기 위한 구체적인 내용

[0011] 이하, 첨부 도면들을 참조하여 본 개시의 다양한 양상들이 더 충분히 설명된다. 그러나 본 개시는 많은 다른 형태들로 구현될 수도 있고, 본 개시 전반에 제시되는 어떠한 특정 구조 또는 기능에 국한된 것으로 해석되지 않아야 한다. 그보다, 이러한 양상들은 본 개시가 철저하고 완전할 수 있고, 해당 기술분야에서 통상의 지식을 가진 자들에게 본 개시의 범위를 충분히 전달하도록 제공된다. 본 명세서의 교시들을 기반으로, 해당 기술분야에서 통상의 지식을 가진 자는 본 명세서에 개시되는 본 개시의 범위가, 본 개시의 임의의 다른 양상과 관계없이 구현되든 아니면 그와 결합되든, 본 개시의 임의의 양상을 커버하는 것으로 의도된다고 인식해야 한다. 예를 들어, 본 명세서에서 제시되는 임의의 수의 양상들을 사용하여 장치가 구현될 수 있거나 방법이 실시될 수 있다. 또한, 본 개시의 범위는 본 명세서에서 제시되는 개시의 다양한 양상들에 부가하여 또는 그 외에 다른 구조, 기능, 또는 구조와 기능을 사용하여 실시되는 그러한 장치 또는 방법을 커버하는 것으로 의도된다. 본 명세서에 개시되는 본 개시의 임의의 양상은 청구항의 하나 또는 그보다 많은 엘리먼트들에 의해 구현될 수 있다고 이해되어야 한다.

[0012] "예시적인"이라는 단어는 본 명세서에서 "예시, 실례 또는 예증으로서의 역할"을 의미하는데 사용된다. 본 명세서에서 "예시적인" 것으로서 설명되는 어떠한 양상도 다른 양상들보다 반드시 선호되거나 유리한 것으로 해석되는 것은 아니다.

[0013] 본 명세서에서는 특정 양상들이 설명되지만, 이러한 양상들의 많은 변형들 및 치환들이 본 개시의 범위 내에 포함된다. 선호되는 양상들의 일부 이익들 및 이점들이 언급되지만, 본 개시의 범위는 특정 이익들, 용도들 또는 목적들에 국한된 것으로 의도되는 것은 아니다. 그보다, 본 개시의 양상들은 다른 무선 기술들, 시스템 구성들, 네트워크들 및 전송 프로토콜들에 폭넓게 적용될 수 있는 것으로 의도되며, 이들 중 일부는 선호되는 양상들에 대한 하기의 설명 및 도면들에서 예로서 설명된다. 상세한 설명 및 도면들은 첨부된 청구항들 및 그 등가물들에 의해 정의되는 본 개시의 범위를 한정하기보다는 단지 본 개시의 실례가 될 뿐이다.

[0014] 본 명세서에서 설명되는 기술들은 CDMA, TDMA, FDMA, OFDMA, SC-FDMA 및 다른 네트워크들과 같은 다양한 무선 통신 네트워크들에 사용될 수 있다. "네트워크"와 "시스템"이라는 용어들은 흔히 상호 교환 가능하게 사용된다. CDMA 네트워크는 범용 지상 무선 액세스(UTRA: Universal Terrestrial Radio Access), cdma2000 등과 같은 무선 기술을 구현할 수 있다. UTRA는 광대역 CDMA(WCDMA) 및 CDMA의 다른 변형들을 포함한다. cdma2000은 IS-2000, IS-95 및 IS-856 표준들을 커버한다. TDMA 네트워크는 글로벌 모바일 통신 시스템(GSM: Global System for Mobile Communications)과 같은 무선 기술을 구현할 수 있다. OFDMA 네트워크는 진화형(Evolved) UTRA(E-UTRA), 울트라 모바일 브로드밴드(UMB: Ultra Mobile Broadband), IEEE 802.11(Wi-Fi), IEEE

ASUS EX2019-p.354
Samsung v. ASUS
IPR2024-00614

802.16(WiMAX), IEEE 802.20, 플래시-OFDMA® 등과 같은 무선 기술을 구현할 수 있다. UTRA 및 E-UTRA는 범용 모바일 통신 시스템(UMTS)의 일부이다. 3GPP 롱 텀 에볼루션(LTE) 및 LTE 어드밴스드(LTE-A: LTE-Advanced)는 E-UTRA를 사용하는 UMTS의 새로운 릴리스들이다. UTRA, E-UTRA, UMTS, LTE, LTE-A 및 GSM은 "3세대 파트너십 프로젝트"(3GPP)로 명명된 조직으로부터의 문서들에 기술되어 있다. cdma2000 및 UMB는 "3세대 파트너십 프로젝트 2"(3GPP2)로 명명된 조직으로부터의 문서들에 기술되어 있다. 본 명세서에서 설명되는 기술들은 위에서 언급된 무선 네트워크들 및 무선 기술들뿐만 아니라, 다른 무선 네트워크들 및 무선 기술들에도 사용될 수 있다. 명확성을 위해, 이러한 기술들의 특정 양상들은 아래에서 LTE/LTE-A에 대해 설명되며, 아래 설명의 대부분에서 LTE/LTE-A 용어가 사용된다.

[0015] 단일 반송파 주파수 분할 다중 액세스(SC-FDMA)는 송신기 측에서는 단일 반송파 변조를 그리고 수신기 측에서는 주파수 도메인 등화를 이용하는 전송 기술이다. SC-FDMA는 OFDMA 시스템과 유사한 성능 및 본질적으로 동일한 전체 복잡도를 갖는다. 그러나 SC-FDMA 신호는 그 본래의 단일 반송파 구조 때문에 더 낮은 피크대 평균 전력비(PAPR: peak-to-average power ratio)를 갖는다. SC-FDMA는 낮은 PAPR이 송신 전력 효율 면에서 모바일 단말에 상당히 유리한 업링크 통신들에서 특별히 큰 관심을 끌어왔다. 이는 현재 3GPP LTE, LTE-A 및 진화형 UTRA에서의 업링크 다중 액세스 방식에 대한 잠정적 가설이다.

[0016] 도 1은 LTE/LTE-A 네트워크일 수도 있는 예시적인 무선 통신 네트워크(100)를 나타낸다. 무선 네트워크(100)는 다수의 진화형 노드 B(eNB: evolved Node B)들(110) 및 다른 네트워크 엔티티들을 포함할 수 있다. eNB는 UE들과 통신하는 스테이션(station)일 수 있으며, 또한 기지국, 노드 B, 액세스 포인트 등으로 지칭될 수도 있다. 각각의 eNB(110)는 특정 지리적 영역에 대한 통신 커버리지를 제공할 수 있다. 3GPP에서, "셀"이라는 용어는 그 용어가 사용되는 맥락에 따라, eNB의 커버리지 영역 및/또는 이 커버리지 영역을 서빙하는 eNB 서브시스템을 의미할 수 있다. 도 1에서는 셀들(102)(예를 들어, 102a, 102b, 102c)이 예시된다.

[0017] eNB는 매크로 셀, 피코 셀, 펨토 셀 및/또는 다른 타입들의 셀에 대한 통신 커버리지를 제공할 수 있다. 매크로 셀은 비교적 넓은 지리적 영역(예를 들어, 반경 수 킬로미터)을 커버할 수 있으며 서비스 가입을 한 UE들에 의한 무제한 액세스를 허용할 수 있다. 피코 셀은 비교적 작은 지리적 영역을 커버할 수 있으며 서비스 가입을 한 UE들에 의한 무제한 액세스를 허용할 수 있다. 펨토 셀은 비교적 작은 지리적 영역(예를 들어, 집)을 커버할 수 있으며, 펨토 셀과의 연관을 갖는 UE들(예를 들어, 폐쇄형 가입자 그룹(CSG: Closed Subscriber Group) 내의 UE들, 집에 있는 사용자들에 대한 UE들 등)에 의한 제한적 액세스를 허용할 수 있다. 매크로 셀에 대한 eNB는 매크로 eNB로 지칭될 수도 있다. 피코 셀에 대한 eNB는 피코 eNB로 지칭될 수도 있다. 펨토 셀에 대한 eNB는 펨토 eNB 또는 홈 eNB로 지칭될 수 있다. eNB는 하나 또는 다수(예를 들어, 3개)의 셀들을 지원할 수 있다.

[0018] 무선 네트워크(100)는 또한 중계국들을 포함할 수 있다. 중계국은 업스트림 스테이션(예를 들어, eNB 또는 UE)으로부터 데이터 및/또는 다른 정보의 송신을 수신하고 다운스트림 스테이션(예를 들어, UE 또는 eNB)으로 데이터 및/또는 다른 정보의 송신을 전송하는 스테이션이다. 중계국은 또한 다른 UE들에 대한 송신들을 중계하는 UE일 수도 있다. 중계국은 또한 중계 eNB, 중계기 등으로 지칭될 수도 있다.

[0019] 무선 네트워크(100)는 서로 다른 타입들의 eNB들, 예를 들어 매크로 eNB들, 피코 eNB들, 펨토 eNB들, 중계기들 등을 포함하는 이종 네트워크일 수도 있다. 이러한 서로 다른 타입들의 eNB들은 무선 네트워크(100)에서 서로 다른 송신 전력 레벨들, 서로 다른 커버리지 영역들, 및 간섭에 대한 서로 다른 영향을 가질 수 있다. 예를 들어, 매크로 eNB들은 높은 송신 전력 레벨(예를 들어, 20 와트)을 가질 수 있는 반면, 피코 eNB들, 펨토 eNB들 및 중계기들은 더 낮은 송신 전력 레벨(예를 들어, 1 와트)을 가질 수 있다.

[0020] 무선 네트워크(100)는 동기 동작 또는 비동기 동작을 지원할 수 있다. 동기 동작의 경우, eNB들은 비슷한 프레임 타이밍을 가질 수 있으며, 서로 다른 eNB들로부터의 전송들이 대략 시간 정렬될 수 있다. 비동기 동작의 경우, eNB들은 서로 다른 프레임 타이밍을 가질 수 있으며, 서로 다른 eNB들로부터의 전송들이 시간 정렬되지 않을 수도 있다. 본 명세서에서 설명되는 기술들은 동기 동작과 비동기 동작 모두에 사용될 수 있다.

[0021] 네트워크 제어기(130)가 한 세트의 eNB들에 연결되어 이러한 eNB들에 대한 조정 및 제어를 제공할 수 있다. 네트워크 제어기(130)는 백홀을 통해 eNB들(110)과 통신할 수 있다. eNB들(110)(예를 들어, 110a, 110b, 110c)은 또한, 예를 들어 무선 또는 유선 백홀을 통해 간접적으로 또는 직접적으로 서로 통신할 수도 있다.

[0022] UE들(120)은 무선 네트워크(100) 전역에 분산될 수 있으며, 각각의 UE는 고정적일 수도 있고 또는 이동할 수도 있다. UE는 또한 단말, 이동국, 가입자 유닛, 스테이션 등으로 지칭될 수도 있다. UE는 스마트폰, 셀룰러폰,

ASUS EX2019-p.355
Samsung v. ASUS
IPR2024-00614

개인용 디지털 보조기기(PDA: personal digital assistant), 태블릿, 넷북, 스마트북, 무선 모뎀, 무선 통신 디바이스, 핸드헬드 디바이스, 랩톱 컴퓨터, 코드리스 전화, 무선 로컬 루프(WLL: wireless local loop) 스테이션 등일 수 있다. UE는 매크로 eNB들, 피코 eNB들, 펨토 eNB들, 중계기들 등과 통신 가능할 수도 있다. 도 1에서, 이중 화살표들이 있는 실선은 UE와 서빙 eNB 간의 전송들을 나타내는데, 서빙 eNB는 다운링크 및/또는 업링크를 통해 UE를 서빙하도록 지정된 eNB이다.

[0023] LTE는 다운링크에 대해 직교 주파수 분할 다중화(OFDM)를 그리고 업링크에 대해 단일 반송파 주파수 분할 다중화(SC-FDM)를 이용한다. OFDM 및 SC-FDM은 시스템 대역폭을 다수(K개)의 직교 부반송파들로 분할하며, 이러한 부반송파들은 또한 일반적으로 톤들, 빈들 등으로도 지칭된다. 각각의 부반송파는 데이터와 함께 변조될 수 있다. 일반적으로, 변조 심벌들은 주파수 도메인에서는 OFDM에 의해 그리고 시간 도메인에서는 SC-FDM에 의해 전송된다. 인접한 부반송파들 간의 간격은 고정적일 수 있으며, 부반송파들의 총 개수(K)는 시스템 대역폭에 좌우될 수 있다. 예를 들어, K는 1.25, 2.5, 5, 10 또는 20 메가헤르츠(MHz)의 시스템 대역폭에 대해 각각 128, 256, 512, 1024 또는 2048과 같을 수 있다. 시스템 대역폭은 또한 부대역들로 분할될 수도 있다. 예를 들어, 부대역은 1.08MHz를 커버할 수 있으며, 1.25, 2.5, 5, 10 또는 20MHz의 시스템 대역폭에 대해 각각 1, 2, 4, 8 또는 16개의 부대역들이 존재할 수 있다.

[0024] 도 2는 LTE에 사용되는 프레임 구조를 나타낸다. 다운링크에 대한 전송 타임라인은 무선 프레임들의 단위들로 분할될 수 있다. 각각의 무선 프레임은 미리 결정된 듀레이션(예를 들어, 10 밀리초(ms))을 가질 수 있고 0 내지 9의 인덱스들을 갖는 10개의 서브프레임들로 분할될 수 있다. 각각의 서브프레임은 2개의 슬롯들을 포함할 수 있다. 따라서 각각의 무선 프레임은 0 내지 19의 인덱스들을 갖는 20개의 슬롯들을 포함할 수 있다. 각각의 슬롯은 L개의 심벌 기간들, 예를 들어 (도 2에 도시된 바와 같은) 정규 주기적 프리픽스에 대한 L = 7개의 심벌 기간들 또는 확장된 주기적 프리픽스에 대한 L = 6개의 심벌 기간들을 포함할 수 있다. 각각의 서브프레임의 2L개의 심벌 기간들에는 0 내지 2L-1의 인덱스들이 할당될 수 있다. 이용 가능한 시간 주파수 자원들은 자원 블록들로 분할될 수 있다. 각각의 자원 블록은 하나의 슬롯에서 N개의 부반송파들(예를 들어, 12개의 부반송파들)을 커버할 수 있다.

[0025] LTE에서, eNB는 eNB의 각각의 셀에 대한 일차 동기 신호(PSS: primary synchronization signal) 및 이차 동기 신호(SSS: secondary synchronization signal)를 전송할 수 있다. 일차 동기 신호 및 이차 동기 신호는 도 2에 도시된 바와 같이, 정규 주기적 프리픽스를 갖는 각각의 무선 프레임의 서브프레임 0과 서브프레임 5 각각의 심벌 기간 6과 심벌 기간 5에서 각각 전송될 수 있다. 동기 신호들은 셀 검출 및 포착을 위해 UE들에 의해 사용될 수 있다. eNB는 서브프레임 0의 슬롯 1의 심벌 기간 0 내지 심벌 기간 3에서 물리적 브로드캐스트 채널(PBCH: Physical Broadcast Channel)을 전송할 수 있다. PBCH는 특정 시스템 정보를 전달(carry)할 수 있다.

[0026] 도 2에 도시된 바와 같이, eNB는 각각의 서브프레임의 첫 번째 심벌 기간에서 물리적 제어 포맷 표시자 채널(PCFICH: Physical Control Format Indicator Channel)을 전송할 수 있다. PCFICH는 제어 채널들에 사용되는 심벌 기간들의 수(M)를 전달할 수 있으며, 여기서 M은 1, 2 또는 3과 같을 수 있고 서브프레임마다 다를 수 있다. M은 또한 예를 들어, 10개 미만의 자원 블록들을 갖는 작은 시스템 대역폭에 대해서는 4와 같을 수도 있다. eNB는 (도 2에 도시되지 않은) 각각의 서브프레임의 처음 M개의 심벌 기간들에서 물리적 HARQ 표시자 채널(PHICH) 및 물리적 다운링크 제어 채널(PDCCH: Physical Downlink Control Channel)을 전송할 수 있다. PHICH는 하이브리드 자동 재전송 요청(HARQ)을 지원하기 위한 정보를 전달할 수 있다. PDCCH는 UE들에 대한 자원 할당에 관한 정보 및 다운링크 채널들에 대한 제어 정보를 전달할 수 있다. eNB는 각각의 서브프레임의 나머지 심벌 기간들에서 물리적 다운링크 공유 채널(PDSCH: Physical Downlink Shared Channel)을 전송할 수 있다. PDSCH는 다운링크 상에서의 데이터 전송을 위해 스케줄링된 UE들에 대한 데이터를 전달할 수도 있다. LTE의 다양한 신호들 및 채널들은 공개적으로 이용 가능한 "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation"이라는 제목의 3GPP TS 36.211에 기술되어 있다.

[0027] eNB는 eNB에 의해 사용되는 시스템 대역폭의 중심 1.08MHz에서 PSS, SSS 및 PBCH를 전송할 수 있다. eNB는 PCFICH와 PHICH가 전송되는 각각의 심벌 기간에서 전체 시스템 대역폭에 걸쳐 이러한 채널들을 전송할 수 있다. eNB는 시스템 대역폭의 일정(certain) 부분들에서 UE들의 그룹들에 PDCCH를 전송할 수 있다. eNB는 시스템 대역폭의 특정 부분들에서 특정 UE들에 PDSCH를 전송할 수 있다. eNB는 브로드캐스트 방식으로 모든 UE들에 PSS, SSS, PBCH, PCFICH 및 PHICH를 전송할 수도 있고, 유니캐스트 방식으로 특정 UE들에 PDCCH를 전송할 수도 있으며, 또한 유니캐스트 방식으로 특정 UE들에 PDSCH를 전송할 수도 있다.

[0028] 각각의 심벌 기간에서 다수의 자원 엘리먼트들이 이용 가능할 수 있다. 각각의 자원 엘리먼트는 하나의 심벌

ASUS EX2019-p.356
Samsung v. ASUS
IPR2024-00614

기간에 하나의 부반송파를 커버할 수 있고 실수 또는 복소수 값일 수 있는 하나의 변조 심벌을 전송하는데 사용될 수 있다. 각각의 심벌 기간에서 기준 신호에 사용되지 않는 자원 엘리먼트들은 자원 엘리먼트 그룹(REG: resource element group)들로 배열될 수 있다. 각각의 REG는 하나의 심벌 기간에 4개의 자원 엘리먼트들을 포함할 수 있다. PCFICH는 심벌 기간 0에서 주파수에 걸쳐 대략 균등한 간격을 둘 수 있는 4개의 REG들을 점유할 수 있다. PHICH는 하나 또는 그보다 많은 수의 구성 가능한 심벌 기간들에서 주파수에 걸쳐 확산될 수 있는 3개의 REG들을 점유할 수 있다. 예를 들어, PHICH에 대한 3개의 REG들이 모두 심벌 기간 0에 속할 수 있거나 심벌 기간 0, 심벌 기간 1 및 심벌 기간 2로 확산될 수도 있다. PDCCH는 처음 M개의 심벌 기간들에서 이용 가능한 REG들 중에서 선택될 수 있는 9개, 18개, 32개 또는 64개의 REG들을 점유할 수 있다. REG들의 특정 결합들만이 PDCCH에 대해 허용될 수도 있다.

[0029] UE는 PHICH와 PCFICH에 사용되는 특정 REG들을 알 수도 있다. UE는 PDCCH에 대한 REG들의 서로 다른 결합들을 탐색할 수 있다. 탐색할 결합들의 수는 일반적으로 PDCCH에 대해 허용된 결합들의 수보다 적다. eNB는 UE가 탐색할 결합들 중 임의의 결합에서 UE에 PDCCH를 전송할 수 있다.

[0030] 도 2a는 LTE에서의 업링크에 대한 예시적인 포맷(200A)을 보여준다. 업링크에 대한 이용 가능한 자원 블록들은 데이터 섹션과 제어 섹션으로 나뉠 수 있다. 제어 섹션은 시스템 대역폭의 2개의 에지들에 형성될 수 있으며 구성 가능한 크기를 가질 수 있다. 제어 섹션의 자원 블록들은 제어 정보의 전송을 위해 UE들에 할당될 수 있다. 데이터 섹션은 제어 섹션에 포함되지 않는 모든 자원 블록들을 포함할 수 있다. 도 2a의 설계는 인접한 부반송파들을 포함하는 데이터 섹션을 발생시키며, 이는 단일 UE에 데이터 섹션의 인접한 부반송파들 전부가 할당되게 할 수도 있다.

[0031] eNB에 제어 정보를 전송하도록 UE에 제어 섹션의 자원 블록들이 할당될 수 있다. 노드 B에 데이터를 전송하도록 UE에 또한 데이터 섹션의 자원 블록들이 할당될 수도 있다. UE는 제어 섹션의 할당된 자원 블록들 상의 물리적 업링크 제어 채널(PUCCH: Physical Uplink Control Channel)(210a, 210b)에서 제어 정보를 전송할 수 있다. UE는 데이터 섹션의 할당된 자원 블록들 상의 물리적 업링크 공유 채널(PUSCH: Physical Uplink Shared Channel)(220a, 220b)에서 데이터만 또는 데이터와 제어 정보 모두를 전송할 수 있다. 업링크 전송은 도 2a에 도시된 바와 같이 서브프레임의 두 슬롯들 모두에 걸칠 수 있으며 주파수에 걸쳐 호핑할 수도 있다.

[0032] LTE에서의 PSS, SSS, CRS, PBCH, PUCCH 및 PUSCH는 공개적으로 이용 가능한 "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation"이라는 제목의 3GPP TS 36.211에 기술되어 있다.

[0033] 도 3은 도 1의 기지국들/eNB들 중 하나 그리고 UE들 중 하나일 수 있는 기지국/eNB(110)와 UE(120)의 설계의 블록도를 나타낸다. 기지국(110)은 또한 다른 어떤 타입의 기지국일 수도 있다. 기지국(110)은 T개의 안테나들(334a-334t)을 구비할 수 있고, UE(120)는 R개의 안테나들(352a-352r)을 구비할 수 있으며, 여기서 일반적으로 $T \geq 1$ 그리고 $R \geq 1$이다.

[0034] 기지국(110)에서, 송신 프로세서(320)는 데이터 소스(312)로부터 데이터를 그리고 제어기/프로세서(340)로부터 제어 정보를 수신할 수 있다. 제어 정보는 PBCH, PCFICH, PHICH, PDCCH 등에 대한 것일 수 있다. 데이터는 PDSCH 등에 대한 것일 수 있다. 프로세서(320)는 데이터 및 제어 정보를 처리(예를 들어, 인코딩 및 심벌 맵핑)하여 데이터 심벌들 및 제어 심벌들을 각각 획득할 수 있다. 프로세서(320)는 또한 예를 들어, PSS, SSS 및 셀 특정 기준 신호에 대한 기준 심벌들을 생성할 수 있다. 송신(TX) 다중 입력 다중 출력(MIMO) 프로세서(330)는, 적용 가능하다면 데이터 심벌들, 제어 심벌들 및/또는 기준 심벌들에 대한 공간 처리(예를 들어, 프리코딩)를 수행할 수 있고, T개의 변조기들(MOD들; 332a-332t)에 T개의 출력 심벌 스트림들을 제공할 수 있다. 각각의 변조기(332)는 (예를 들어, OFDM 등을 위해) 각각의 출력 심벌 스트림을 처리하여 출력 샘플 스트림을 획득할 수 있다. 각각의 변조기(332)는 출력 샘플 스트림을 추가 처리(예를 들어, 아날로그로 변환, 증폭, 필터링 및 상향 변환)하여 다운링크 신호를 획득할 수 있다. 변조기들(332a-332t)로부터의 T개의 다운링크 신호들은 T개의 안테나들(334a-334t)을 통해 각각 전송될 수 있다.

[0035] UE(120)에서, 안테나들(352a-352r)은 기지국(110)으로부터 다운링크 신호들을 수신할 수 있고 수신 신호들을 복조기들(DEMOD들; 354a-354r)에 각각 제공할 수 있다. 각각의 복조기(354)는 각각의 수신 신호를 조정(예를 들어, 필터링, 증폭, 하향 변환 및 디지털화)하여 입력 샘플들을 획득할 수 있다. 각각의 복조기(354)는 (예를 들어, OFDM 등에 대한) 입력 샘플들을 추가 처리하여 수신 심벌들을 획득할 수 있다. MIMO 검출기(356)는 R개의 모든 복조기들(354a-354r)로부터 수신 심벌들을 획득할 수 있고, 적용 가능하다면 수신 심벌들에 MIMO 검출을 수행하여, 검출된 심벌들을 제공할 수 있다. 수신 프로세서(358)는 검출된 심벌들을 처리(예를 들어, 복조, 디인터리빙 및 디코딩)하여, UE(120)에 대한 디코딩된 데이터를 데이터 싱크(360)에 제공할 수 있으며, 디코딩

ASUS EX2019-p.357
Samsung v. ASUS
IPR2024-00614

된 제어 정보를 제어기/프로세서(380)에 제공할 수 있다.

[0036] 업링크 상에서, UE(120)에서는 송신 프로세서(364)가 데이터 소스(362)로부터의 (예를 들어, PUSCH에 대한) 데이터 및 제어기/프로세서(380)로부터의 (예를 들어, PUCCH에 대한) 제어 정보를 수신하여 처리할 수 있다. 프로세서(364)는 또한 기준 신호에 대한 기준 심벌들을 생성할 수 있다. 송신 프로세서(364)로부터의 심벌들은 적용 가능하다면 TX MIMO 프로세서(366)에 의해 프리코딩될 수 있고, (예를 들어, SC-FDM 등을 위해) 변조기들(354a-354r)에 의해 추가 처리되어 기지국(110)으로 전송될 수 있다. 기지국(110)에서는, UE(120)에 의해 전송된 디코딩된 데이터 및 제어 정보를 획득하기 위해, UE(120)로부터의 업링크 신호들이 안테나들(334)에 의해 수신되고, 복조기들(332)에 의해 처리되며, 적용 가능하다면 MIMO 검출기(336)에 의해 검출되고, 수신 프로세서(338)에 의해 추가 처리될 수 있다. 프로세서(338)는 디코딩된 데이터를 데이터 싱크(339)에 그리고 디코딩된 제어 정보를 제어기/프로세서(340)에 제공할 수 있다.

[0037] 제어기들/프로세서들(340, 380)은 각각 기지국(110) 및 UE(120)에서의 동작을 지시할 수 있다. 기지국(110)에서 제어기/프로세서(340), 송신 프로세서(320), TX MIMO 프로세서(330), 수신 프로세서(338) 및/또는 다른 프로세서들과 모듈들은 도 6의 동작들(600) 및/또는 본 명세서에서 설명되는 기술들에 관한 다른 프로세스들을 수행 또는 지시할 수 있다. UE(120)에서 제어기/프로세서(380), 송신 프로세서(364), TX MIMO 프로세서(366), 수신 프로세서(358) 및/또는 다른 프로세서들과 모듈들은 도 6의 동작들(600) 및/또는 본 명세서에서 설명되는 기술들에 관한 다른 프로세스들을 수행 또는 지시할 수 있다. 메모리들(342, 382)은 각각 기지국(110) 및 UE(120)에 대한 데이터 및 프로그램 코드들을 저장할 수 있다. 스케줄러(344)는 다운링크 및/또는 업링크를 통한 데이터 전송을 위해 UE들을 스케줄링할 수 있다.

[0038] 물리적 하이브리드 ARQ 표시자 채널(PHICH)은, eNodeB가 물리적 업링크 공유 채널(PUSCH)을 통한 전송을 정확하게 수신했는지 여부를 나타내는 하이브리드 ARQ(HARQ) ACK/NACK 정보를 전달하는 다운링크 채널이다. 특정 양상들에서, (서로 다른 UE들에 대한) 다수의 PHICH들이 동일한 세트의 다운링크 자원 엘리먼트들에 맵핑된다. 특정 양상들에서는, 마스터 정보 블록(MIB: Master Information Block)이 PHICH 자원 정보를 전달한다. MIB는 네트워크에 대한 UE의 초기 액세스에 필수적인, 한정된 수의 가장 자주 전송되는 파라미터들을 포함하는 시스템 정보의 블록이다. 파라미터들은 일반적으로, 다운링크 시스템 대역폭, 다운링크에서의 HARQ 확인 응답 시그널링에 할당된 자원들의 표시자, 그리고 시스템 프레임 번호를 포함한다.

[0039] 특정 양상들에서, MIB는 PHICH가 정상 듀레이션인지 아니면 연장된 듀레이션인지를 나타내는 비트를 포함한다. 정상 듀레이션의 경우, PHICH는 단지 첫 번째 OFDM 심벌에 있을 수 있다. 그러나 연장된 듀레이션의 경우, PHICH는 PHICH와 연관된 서브프레임의 서브프레임 타입에 따라, 2개 또는 3개의 OFDM 심벌들에 있을 수도 있다. 따라서 어떤 경우들에는, 업링크 전송들의 HARQ 응답들을 위해 제 2 CC의 적어도 하나의 다운링크 서브프레임에서 PHICH에 대해 정상인 경우보다 추가적인 자원들이 확보될 수 있다.

[0040] 특정 양상들에서, MIB는 PHICH 자원들의 총 개수를 나타내는 2비트를 포함한다. 1/6, 1/2, 1 그리고 2를 포함하여 PHICH 자원들의 4개의 가능한 크기들(N_g)이 존재할 수 있으며, 여기서는 정규 주기적 프리픽스(CP: Cyclic Prefix)에 대한 상한($N_g*(N_{RB}^{DL}/8)$) 그리고 확장된 CP에 대한 2*상한($N_g*(N_{RB}^{DL}/8)$)에 의해 PHICH 그룹들의 수(N_{PHICH}^{group})가 주어지고, 여기서 N_{RB}^{DL}은 다운링크(DL)에서의 자원 블록(RB: Resource Block)들의 수이다.

[0041] 특정 양상들에서는, 물리적 제어 포맷 표시자 채널(PCFICH) 및 PHICH를 기초로, UE는 물리적 다운링크 제어 채널(PDCCH)에 대해 남은 자원을 결정할 수 있다.

[0042] 표 1은 LTE TDD에 대한 7개의 UL/DL 구성들을 나타낸다. 'D'는 다운링크 전송을 위한 서브프레임을 나타내고, 'S'는 보호 시간에 사용되는 특수 서브프레임을 나타내며, 'U'는 업링크 전송을 위한 서브프레임을 나타낸다.

ASUS EX2019-p.358
Samsung v. ASUS
IPR2024-00614

ASUS EX2019-p.359
Samsung v. ASUS
IPR2024-00614

표 1

UL/DL 구성	DL과 UL 간 전환 주기성	서브프레임 번호									
		0	1	2	3	4	5	6	7	8	9
0	5ms	D	S	U	U	U	D	S	U	U	U
1	5ms	D	S	U	U	D	D	S	U	U	D
2	5ms	D	S	U	D	D	D	S	U	D	D
3	10ms	D	S	U	U	U	D	D	D	D	D
4	10ms	D	S	U	U	D	D	D	D	D	D
5	10ms	D	S	U	D	D	D	D	D	D	D
6	5ms	D	S	U	U	U	D	S	U	U	D

[0043]

[0044] 특정 양상들에서, 시분할 듀플렉스(TDD)의 경우에는, PHICH 자원의 양이 더 서브프레임 의존적인데, 예를 들어 (m_i*N_{PHICH}^{group})이다. 특정 양상들에서, DL/UL 구성 0을 갖는 TDD의 경우, 서브프레임 0과 서브프레임 5에서는 m_i = 2이다. 다른 구성들의 경우, m_i = 1 또는 0인데, 여기서 0은 PHICH 자원이 전혀 없는 경우에 해당한다.

[0045] 특정 양상들에서는, UE의 경우, PUSCH 전송을 위한 PHICH 자원이 그룹 인덱스(n_{PHICH}^{group}) 및 그룹 내에서의 시퀀스 인덱스(n_{PHICH}^{seq})에 의해 식별될 수 있다. 또한, PUSCH 전송에서 PHICH 자원으로의 맵핑은 다음 중 하나 또는 그보다 많은 것을 기초로 할 수 있다:

[0046] • N_{PHICH}^{group}

[0047] • 대응하는 PUSCH 전송의 첫 번째 슬롯에서 가장 낮은 물리적 자원 블록(PRB: Physical Rescource Block) 인덱스를 나타내는 $I_{PRB\_RA}^{lowest\_index}$

[0048] • 복조 기준 신호(DM-RS: Demodulation Reference Signal) 필드에 대한 주기적 시프트를 나타내는 n_{DMRS}

[0049] • PHICH 변조에 사용되는 확산 인자 크기를 나타내는 N_{SF}^{PHICH}

[0050] • 서브프레임 4 또는 서브프레임 9에서의 PUSCH 전송에 대한 TDD UL/DL 구성 0에 대해서는 일반적으로 1이고, 다른 경우에는 0인 I_{PHICH}

[0051] 도 4는 본 개시의 특정 양상들에 따라, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파에 대한 예시적인 PHICH 자원 맵핑(400)을 나타낸다. TDD 요소 반송파(CC) 2(402)는 UL/DL 서브프레임 구성 0을 갖는 TDD 반송파이다. TDD UL/DL 구성 0에서, 무선 프레임(서브프레임 0 - 서브프레임 9)의 각각의 5ms 하프(half) 프레임(예를 들어, 서브프레임 0 - 서브프레임 4 그리고 서브프레임 5 - 서브프레임 9)은 다운링크 서브프레임, 특수 서브프레임 그리고 3개의 업링크 서브프레임들을 포함한다. 예를 들어, 도 4에 도시된 바와 같이, 서브프레임 0과 서브프레임 5는 다운링크 서브프레임들이고, 서브프레임 1과 서브프레임 6은 특수 서브프레임들이며, 서브프레임 2 - 서브프레임 4 그리고 서브프레임 7 - 서브프레임 9는 업링크 서브프레임들이다.

[0052] 특정 양상들에서, TDD UL/DL 구성 0의 경우, 업링크 서브프레임들을 통한 업링크 전송들에 대한 HARQ 응답을 제공하기 위해 다운링크 PHICH에 다운링크 서브프레임들과 특수 서브프레임들이 사용될 수 있다. 따라서 TDD UL/DL 구성 0의 모든 각각의 5ms 하프 프레임은 3개의 업링크 서브프레임들을 통한 UL 전송들에 응답하기 위해

단 2개의 PHICH 자원들만을 포함한다. 모든 각각의 하프 프레임의 2개의 PHICH 자원들 중 적어도 하나는 2개의 서브프레임들을 통한 업링크 전송들에 대한 HARQ 응답을 처리해야 한다. 예를 들어, 도 4에 도시된 바와 같이, TDD UL/DL 구성 0의 경우에는, 서브프레임 0과 서브프레임 5가 2개의 서브프레임들을 통한 업링크 전송들에 대한 응답들을 처리할 수 있도록 이러한 서브프레임들에 대해 PHICH 자원의 2배(m_i = 2)가 확보된다.

[0053] 도 4에 도시된 바와 같이, 서브프레임 0과 연관된 PHICH 자원은 서브프레임 3과 서브프레임 4를 통한 업링크 전송들에 대한 HARQ 응답들을 처리하고, 서브프레임 5의 PHICH 자원은 서브프레임 8과 서브프레임 9를 통한 업링크 전송들에 대한 HARQ 응답들을 처리한다. 또한, 도시된 바와 같이, 서브프레임 1은 업링크 서브프레임 7에 대한 응답들을 처리하고, 서브프레임 6은 업링크 서브프레임 2에 대한 응답들을 처리한다. 특정 양상들에서, 서브프레임 3과 서브프레임 4(또는 서브프레임 8과 서브프레임 9)에서의 PUSCH에 대한 PHICH는 I_{PHICH}로 구별된다.

[0054] 한 양상에서, UE는 데이터 전송을 제 1 구성을 사용하는 제 1 반송파에서부터 제 2 구성을 사용하는 제 2 반송파까지 교차 스케줄링(cross schedule)할 수 있다. 예를 들어, UE는 다른 반송파를 통해 전송된 PUSCH 데이터에 관해 제 1 반송파를 통해 PHICH 제어 정보를 수신할 수 있다. 특정 양상들에서, TDD UL/DL 구성 0 반송파가 서로 다른 UL/DL 구성을 갖는 다른 FDD 반송파 또는 다른 TDD 반송파에 의해 교차 스케줄링될 때, 구성 0을 갖는 TDD 반송파의 업링크 서브프레임들을 통한 업링크 전송들의 적절한 HARQ 응답을 위해 다른 FDD 또는 TDD 반송파의 서브프레임 0과 서브프레임 5에 대한 PHICH 자원은 2배가 되어야 한다.

[0055] 예를 들어, 도 5는 본 개시의 특정 양상들에 따라, 주파수 분할 듀플렉스(FDD: Frequency Division Duplex) 다운링크 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(500)을 나타낸다. FDD DL CC1(502)은 FDD 다운링크 반송파이고, 위에서 언급한 바와 같은 TDD CC2(402)는 UL/DL 서브프레임 구성 0을 갖는 TDD 반송파이다. 도 5에 도시된 바와 같이, FDD DL CC1은 UL/DL 구성 0을 갖는 TDD CC2을 교차 스케줄링한다. 앞에서 논의한 바와 같이, TDD CC2의 업링크 서브프레임들을 통한 업링크 전송의 적절한 HARQ 응답을 위해 FDD DL CC1의 서브프레임 0 및 서브프레임 5와 연관된 PHICH 자원은 2배가 되어야 한다. 예를 들어, PDCCH CC는 단지 임의의 서브프레임 I에 대해 m_i = 1을 갖지만, TDD CC2는 동일한 UL HARQ 동작을 위해 일부 서브프레임들(예를 들어, 0과 5)에 대해 이상적으로는 m_i = 2를 요구한다.

[0056] 특정 양상들에서, PHICH 자원의 양은 셀 내의 모든 UE들에 대한 PDCCH 검출에 영향을 준다. 따라서 PDCCH CC에 대한 PHICH 자원은 특별한 주의 없이 단순히 2배가 되진 않을 수도 있다.

[0057] 도 6은 본 개시의 특정 양상들에 따라, 물리적 하이브리드 ARQ 표시자 채널(PHICH)의 할당을 위한 예시적인 동작들(600)을 나타낸다. 602에서, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC)가 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC에 의해 반송파 교차 스케줄링된다고 결정함으로써 동작들(600)이 시작된다. 604에서는, 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍이 결정된다. 606에서는, 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 제 2 CC에 대한 서브프레임에서, 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성이 결정된다. 608에서는, HARQ 자원 가용성 결정을 기초로 업링크 전송들이 수행된다.

[0058] 특정 양상들에 따르면, UE는 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 제 2 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정할 수 있다. 어떤 경우들에는, 제 2 CC에서의 업링크 서브프레임들의 세트는 제 1 TDD CC에서의 업링크 서브프레임들의 세트의 서브세트일 수 있다. 대안으로, 제 2 CC에서의 업링크 서브프레임들의 세트는 제 1 TDD CC에서의 업링크 서브프레임들의 세트의 수퍼세트일 수 있다.

[0059] 특정 양상들에 따르면, UE는 제 1 CC를 통한 업링크 전송들의 UL 하이브리드 자동 재전송 요청(HARQ) 타이밍은 제 1 CC에 대해 특정된 업링크 전송들의 UL HARQ 타이밍을 기초로 한다고 결정할 수 있다.

[0060] 특정 양상들에 따르면, UE는 PHICH 자원들이 이용 가능하다고 결정하고, 그 결정에 응답하여, 결정된 PHICH 자원을 기초로 HARQ 응답을 결정할 수 있다.

[0061] 특정 양상들에 따르면, HARQ 응답은 부정 응답이라고 결정될 수도 있으며, UE는 비-적응적 업링크 데이터 전송을 수행할 수 있다.

[0062] 특정 양상들에 따르면, PHICH 자원이 이용 불가능하다고 결정될 수 있으며, 그 결정에 응답하여, UE는 업링크

ASUS EX2019-p.360
Samsung v. ASUS
IPR2024-00614

데이터 전송을 보류할 수 있다.

[0063] 특정 양상들에 따르면, PHICH 자원이 이용 불가능하다고 결정될 수 있으며, 업링크 승인을 스케줄링하는 다운링크 제어 채널이 검출될 수 있고, UE는 업링크 승인에 응답하여 업링크 데이터 전송을 수행할 수 있다.

[0064] 도 7은 본 개시의 특정 양상들에 따라, 물리적 하이브리드 ARQ 표시자 채널(PHICH)의 할당을 위한 예시적인 동작들(700)을 나타낸다. 동작들(700)은 예를 들어, eNB에 의해 수행될 수 있다.

[0065] 702에서, UE에 대해, 제 1 업링크(UL)/다운링크(DL) 서브프레임 구성을 갖는 제 1 시분할 듀플렉스(TDD) 요소 반송파(CC) 및 제 2 UL/DL 서브프레임 구성을 갖는 제 2 CC를 구성함으로써 동작들(700)이 시작되며, 여기서 제 1 CC는 제 2 CC에 의해 반송파 교차 스케줄링된다. 704에서, eNB는 UE에 대해, 제 1 CC를 통한 업링크 전송들의 하이브리드 자동 재전송 요청(HARQ) 타이밍을 결정한다. 706에서, eNB는 제 1 CC를 통한 업링크 전송들의 결정된 HARQ 타이밍을 기초로, 제 2 CC에 대한 서브프레임에서, 제 1 CC를 통한 업링크 전송들에 대한 물리적 HARQ 표시자 채널(PHICH) 자원들의 가용성을 결정한다. 708에서, eNB는 PHICH 자원 가용성 결정을 기초로 UE에 대해, 제 1 CC에 대한 서브프레임에 대해 업링크 스케줄링 동작을 수행한다.

[0066] 특정 양상들에서, TDD CC 0에 대한 서브프레임 0과 서브프레임 5에서 PDCCH CC에 대해 PHICH 자원의 2배가 확보될 수 있는데, 즉 $m_0 = m_5 = 2$이며, 여기서 제 1 세트의 PHICH 자원은 FDD 및 TDD PDCCH CC 모두에 적용 가능한 통상의 $m_i = 1$인 경우와 동일하게 정의될 수 있고, 제 2 세트의 PHICH 자원은 PDCCH CC에서부터 TDD 구성 0까지의 반송파 교차 스케줄링 하에서 UE들에 대해서만 가시적이고 적용 가능하게 정의될 수 있다. 한 양상에서, (교차 스케줄링되지 않는) 다른 모든 UE들에 대해서는, 제 2의 추가 세트의 PHICH 자원이 투명하다.

[0067] 특정 양상들에서, 제 2 세트의 PHICH 자원은 일부 PDCCH 자원을 재사용(예를 들어, PDCCH 자원의 일부를 확보)함으로써 정의된다. 재사용되는 PDCCH 자원은 다른 UE들에 대한 PDCCH 스케줄링 영향을 최소화하도록 선택될 수 있다. 예를 들어, PDCCH 자원 풀의 마지막 제어 채널 엘리먼트(CCE: Control Channel Element)가 재사용을 위해 선택될 수 있는데, 이는 일반적으로 마지막 CCE가 PDCCH에 가장 덜 사용되기 때문이다.

[0068] 한 양상에서, 재해석에 필요한 PDCCH CCE들의 수는 PHICH 자원 크기에 좌우된다. 예컨대, N_g=1이고, N_{RB}^{DL}=100이라면, 정상 CP의 경우, 상한(1*100/8) = 13개의 PHICH 그룹들, 또는 156개의 RE들(각각의 그룹은 12개의 RE들임), 또는 5개의 CCE들(각각의 CCE는 36개의 RE들임)을 갖는다.

[0069] 특정 양상들에서, 이러한 접근은 UL HARQ 동작에 대해 충분히 융통성 있고 하위 호환성이 있다. 그러나 이는 상당한 PDCCH 자원들을 필요로 할 수 있으며, 그러므로 PDCCH 용량에 상당한 영향을 부과한다.

[0070] PHICH 자원 맵핑을 위한 I_{PHICH}의 사용이 (36.213 std에 정의된 바와 같이) 다음과 같이 정의될 수 있다:

$$n_{PHICH}^{group} = (I_{PRB\_RA} + n_{DMRS}) \bmod N_{PHICH}^{group} + I_{PHICH} N_{PHICH}^{group}$$
$$n_{PHICH}^{seq} = (\lfloor I_{PRB\_RA} / N_{PHICH}^{group} \rfloor + n_{DMRS}) \bmod 2N_{SF}^{PHICH}$$

[0071]

[0072] 상기의 정의는 2배의 PHICH 자원들을 필요로 한다. 한 양상에서는, 여전히 단 한 세트의 PHICH 자원만 ($m_0=m_5=1$)이 확보될 수 있으며, I_{PHICH}는 그 한 세트의 PHICH 자원을 기초로 상이하게 사용될 수 있다. 예를 들어, I_{PHICH}는 PRB에 대한 오프셋(I_{PRB_RA})이나 DM-RS, 또는 이 둘의 결합으로서 사용될 수 있다. UL MIMO 동작에서는, 2개의 UL 코드워드들에 2개의 PHICH들이 필요하며, 두 번째 PHICH는 I_{PRB_RA} + 1을 기초로 유도된다는 점에 유의해야 한다. 일례는 I-Q 번들링인데, 즉 제 1 UL 서브프레임이 I(또는 Q)-브랜치에 맵핑된다면, 제 2 UL 서브프레임은 Q(또는 I)-브랜치에 맵핑되고, 혹은 그 반대도 가능하다.

[0073] 한 양상에서, I_{PHICH}가 DM-RS의 오프셋으로서 사용된다면, 다음을 가질 수 있다:

$$n_{PHICH}^{group} = (I_{PRB\_RA} + n_{DMRS} + I_{PHICH}) \bmod N_{PHICH}^{group}$$
$$n_{PHICH}^{seq} = (\lfloor I_{PRB\_RA} / N_{PHICH}^{group} \rfloor + n_{DMRS} + I_{PHICH}) \bmod 2N_{SF}^{PHICH}$$

[0074]

[0075] 특정 양상들에서, DM-RS는 임의의 PHICH 충돌들을 완화하는데 사용될 수 있다. 이는 일반적으로, (특히, 서브프레임 간 PUSCH 호핑이 인에이블되는 경우에) 재전송들에 대한 PHICH 충돌들을 피하기 위한 eNB 구현에 달려 있다. UE의 측면에서, PHICH를 필요로 하는 2개의 UL 서브프레임들은 항상 서로 다른 PHICH 자원들에 들어갈

ASUS EX2019-p.361
Samsung v. ASUS
IPR2024-00614

수 있다. 그렇지 않으면, UE에 대한 에러 이벤트가 있을 수도 있다.

[0076] 특정 양상들에서, UL 서브프레임들의 쌍에 응답하는 2개의 PHICH들에 대해 시간 도메인 번들링 동작이 수행될 수도 있다. 예를 들어, 번들링 동작은 논리 AND 동작의 수행을 포함할 수 있는데, 즉 HARQ 응답들 둘 다 ACK라면, ACK가 전송되고, 그렇지 않으면 NAK가 전송된다. 한 양상에서, PHICH 자원은 UL 서브프레임들의 쌍의 제 1 서브프레임의 첫 번째 슬롯의 시작 PRB를 기초로 맵핑될 수 있다. 특정 양상들에서, 단일 PHICH 및 PDCCH의 결합은 어느 서브프레임이 보류, 재전송 또는 새로운 전송을 위한 것인지를 결정할 수 있다.

[0077] 도 8은 본 개시의 특정 양상들에 따라, PHICH 및 PDCCH를 기반으로 서브프레임들의 보류, 재전송 또는 새로운 전송을 결정하기 위한 예시적인 표(800)를 나타낸다. 802에서, PHICH가 ACK이고 PDCCH가 0이라면, UE는 두 UL 전송들 모두를 보류한다. 804에서, PHICH가 ACK이고 PDCCH가 1이라면, UE는 UL 전송들 중 하나(예를 들어, 쌍에서 두 번째 전송)를 보류하고, PDCCH를 기반으로 다른 서브프레임을 전송한다. 806에서, PHICH가 NAK이고 PDCCH가 0이라면, UE는 두 서브프레임들 모두를 재전송한다. 808에서, PHICH가 NAK이고 PDCCH가 1이라면, UE는 UL 전송들 중 하나(예를 들어, 쌍에서 두 번째 전송)를 재전송하고, PDCCH를 기반으로 다른 서브프레임을 전송한다. 810에서, PHICH가 ACK/NAK이고 PDCCH가 2라면, UE는 대응하는 PDCCH들을 기반으로 두 서브프레임들 모두를 전송한다.

[0078] 특정 양상들에서, TDD CC2(402)의 각각의 업링크 서브프레임이 TDD CC2를 교차 스케줄링하는 제 2 CC(예를 들어, FDD DL CC1(502))에서의 개별 다운링크 서브프레임과 연관된 PHICH 자원에 맵핑될 수 있도록 UL HARQ 타임라인이 변경된다. 예를 들어, UL HARQ 타임라인의 변경은 FDD에서와 같이 PUSCH와 PHICH 간 4ms 타이밍을 기초로 할 수 있다.

[0079] 그러나 서로 다른 구성들의 TDD의 어떤 결합들의 경우에는, 이러한 변경이 불가능하다. 예를 들어, 단 5개의 다운링크 서브프레임들만이 있는 구성 6의 경우에는, TDD #0에서 6개의 UL 서브프레임들에 대한 일대일 맵핑을 갖는 것이 불가능하다. 따라서 특정 양상들에서, 구성 #5 및 구성 #0 TDD 반송파 집합(CA: carrier aggregation)의 경우에는 HARQ 응답이 5개까지의 UL 서브프레임들로 제한될 수 있는 한편, #0인 다른 모든 TDD 구성들의 경우에는, 다른 모든 TDD 구성들이 적어도 6개의 다운링크 서브프레임들을 갖기 때문에 일대일 맵핑이 정의될 수 있다. 특정 양상들에서, TDD 구성 #0에 대한 UL HARQ 프로세스들의 수는 또한 7에서 6으로 변경될 수 있으며, 여기서는 각각의 HARQ 프로세스에 대해 RTT(round trip time)가 10ms로 고정된다.

[0080] 변경된 타이밍에 따라, UL 서브프레임에 대한 UL 스케줄링 결정들이 동일한 서브프레임에서 이루어지지 않는다. 특정 양상들에서, 이는 어떠한 UL 스케줄링 복잡도로 이어질 수도 있다.

[0081] 도 9a는 본 개시의 특정 양상들에 따라, 주파수 분할 듀플렉스(FDD) 다운링크 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(900A)에 대한 HARQ 타임라인의 변경을 나타낸다. TDD 구성 0에 대해 도 9a의 타임라인 변경은 8ms의 HARQ 왕복 시간(RTT)을 기초로 한다. 도시된 바와 같이, HARQ 타임라인의 변경은 TDD CC2의 업링크 서브프레임들과 FDD DL CC1의 다운링크 서브프레임들 간의 일대일 맵핑으로 이어진다.

[0082] 도 9b는 본 개시의 특정 양상들에 따라, 주파수 분할 듀플렉스(FDD) 다운링크 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(900B)에 대한 HARQ 타임라인의 변경을 나타낸다. TDD 구성 0에 대해 도 9b의 타임라인 변경은 8, 10, 11ms의 HARQ RTT들을 기초로 한다.

[0083] 특정 양상들에서는, 예를 들어 PUSCH와 PHICH 간의 지연을 4ms로 고정하고, 반송파 교차 스케줄링된 UE들과 동일 반송파 스케줄링된 UE들에 대한 UL 스케줄링 지연/융통성을 TDD #0을 통한 UL 전송들에 맞춰 조정하여, TDD #0에 대한 다른 HARQ RTT가 가능하다. 다른 RTT들은 10ms 및 11ms를 포함할 수 있다.

[0084] 도 10은 본 개시의 특정 양상들에 따라, UL/DL 서브프레임 구성 1을 갖는 다른 TDD 반송파에 의한, UL/DL 서브프레임 구성 0을 갖는 TDD 반송파의 교차 스케줄링(1000)에 대한 HARQ 타임라인의 변경을 나타낸다. TDD CC1(1002)은 UL/DL 서브프레임 구성 1을 갖는 TDD CC이다. 도 10에서는, TDD CC2에 대해 10ms HARQ RTT가 유지된다. 특정 양상들에서는, 2개의 개별 지연 결합들, 예를 들어 4+6 또는 6+4가 존재할 수 있다. 첫 번째 숫자는 일반적으로 PDCCH/PHICH와 PUSCH 간의 지연이고, 두 번째 숫자는 일반적으로 PUSCH와 PDCCH/PHICH 간의 지연이다. 특정 양상들에서, 이 구성에 대해 다른 RTT들이 또한 가능하다.

[0085] 반송파 집합에 대한 다른 대안들이 또한 가능한데, 예를 들어 PHICH에 대한 더 높은 차수의 변조(QPSK), 비동기 UL H-ARQ, PDSCH 영역의 자원들을 점유하는 새로운 PHICH 설계의 사용이 가능하다. 또 다른 대안은 하나의 PHICH + PDCCH, 예를 들면, 다른 I_{PHICH}는 지원되지 않으면서(그러나 재전송들을 위해 PDCCH에 의존함), 하나의

ASUS EX2019-p.362
Samsung v. ASUS
IPR2024-00614

I_{PHICH}에 대한 단 한 세트의 PHICH 자원(예를 들어, I_{PHICH} = 0에 대해 고정되고, 0 또는 1에 대해 구성된 계층 3)일 수 있다.

[0086] 서로 다른 UL/DL 구성들을 갖는 TDD CC들 간의 반송파 교차 스케줄링의 경우들에는 추가 PHICH 관리 문제들이 존재한다.

[0087] 도 11은 표 1에 도시된 7개의 TDD 구성들에 대한 m_i의 값을 나타낸다. 도 11에 도시된 바와 같이, 특정 UL/DL 구성들의 하나 또는 그보다 많은 서브프레임들에 대해, m_i = 0이다. 특정 양상들에서, 서로 다른 UL/DL 구성들을 갖는 TDD CC들이 교차 스케줄링되면, 이는 교차 스케줄링된 업링크 서브프레임들을 통한 업링크 전송들에 HARQ 응답들을 제공하는 데 대한 PHICH 자원들의 이용 불가능성으로 이어질 수 있다.

[0088] 예를 들어, 도 12는 본 개시의 특정 양상들에 따라, UL/DL 서브프레임 구성 2를 갖는 TDD 반송파에 의한, UL/DL 서브프레임 구성 1을 갖는 TDD 반송파의 교차 스케줄링(1200)을 나타낸다. TDD CC1(1202)은 UL/DL 서브프레임 구성 2를 갖는 TDD 반송파이고, TDD CC2(1204)는 UL/DL 서브프레임 구성 1을 갖는 TDD 반송파이다. 도 12에 도시된 바와 같이, TDD CC2는 TDD CC1에 의해 교차 스케줄링된다. 특정 양상들에서, TDD CC2의 경우, Rel-8/9/10 HARQ 타이밍 하에서, 서브프레임 8과 서브프레임 3에서의 UL 재전송들을 트리거하는 PHICH는 각각 서브프레임 4와 서브프레임 9에 위치한다. 그러나 TDD CC1의 경우, m_4 = m_9 = 0이다. 따라서 TDD CC2의 서브프레임 8과 서브프레임 3을 이용하여 이루어지는 업링크 전송들의 HARQ 응답들을 위해 TDD CC1의 서브프레임 4와 서브프레임 9에서 이용 가능한 PHICH 자원들은 존재하지 않는다.

[0089] 특정 양상들에서, UL/DL 서브프레임 구성 0을 갖는 TDD CC를 수반하는 CC들의 교차 스케줄링을 위해 위에서 논의한 해법들이 이 문제를 해결하기 위해 적용될 수 있다. 예를 들어, m_4 = m_9 = 1이 되도록 TDD CC1의 서브프레임 4와 서브프레임 9에 대해 PHICH 자원들이 할당될 수 있다. 한 양상에서, TDD CC1의 서브프레임 4와 서브프레임 9에 대한 PHICH 자원들은 새로운 UE들에만 할당된다. 레거시 UE들에 대해 m_4와 m_9는 그대로 0이다. 한 양상에서, PDCCH에 대해 확보된 마지막 CCE를 사용하여 새로운 PHICH가 전송될 수 있다.

[0090] 특정 양상들에서, HARQ 타이밍이 변경될 수 있다. 예컨대, TDD CC1의 서브프레임 3이 TDD CC2의 서브프레임 7과 서브프레임 8 모두에 대해 PHICH를 전송할 수도 있다. 특정 양상들에서, 이러한 HARQ 타이밍은 하드코딩(예를 들어, 표준에 의해 규정)되거나 (예를 들어, RRC 시그널링을 통해) 구성 가능할 수도 있다.

[0091] 특정 양상들에서, (앞에서 논의한 바와 같이) 2배의 PHICH 자원들 또는 단일 PHICH 자원이 TDD CC1의 다운링크 서브프레임들에 대해 확보될 수 있다. I_PHICH는 어느 서브프레임 PHICH가 예정되는지를 나타내는데 사용될 수 있다. 한 양상에서, 2배의 PHICH 자원들이 사용된다면, 이들은 새로운 UE들에만 가시적이다. 한 양상에서, 단일 PHICH 자원이 사용된다면, I_PHICH는 TDD CC2의 2개의 UL 서브프레임들의 PHICH를 서로 다른 자원들에 맵핑하는데 사용될 수 있다.

[0092] 도 13은 UL/DL 서브프레임 구성 2를 갖는 TDD 반송파에 의한, UL/DL 서브프레임 구성 1을 갖는 TDD 반송파의 교차 스케줄링(1300)을 나타내며, 여기서는 본 개시의 특정 양상들에 따라 서브프레임 3과 서브프레임 8에 대해 추가 PHICH 자원이 할당된다. 도 13에 도시된 바와 같이, TDD CC1의 서브프레임 3과 서브프레임 8에 통상의 PHICH 자원들의 2배가 할당된다. 도시된 바와 같이, 서브프레임 3과 서브프레임 8 각각의 PHICH 자원들이 TDD CC2의 2개의 서브프레임들에 대한 HARQ 응답들을 처리한다.

[0093] 해당 기술분야에서 통상의 지식을 가진 자들은 정보 및 신호들이 다양한 다른 기술들 및 기법들 중 임의의 것을 이용하여 표현될 수 있음을 이해할 것이다. 예를 들어, 상기 설명 전반에 걸쳐 참조될 수 있는 데이터, 명령들, 명령어들, 정보, 신호들, 비트들, 심벌들 및 칩들은 전압들, 전류들, 전자파들, 자기 필드들 또는 자기 입자들, 광 필드들 또는 광 입자들, 또는 이들의 임의의 결합으로 표현될 수 있다.

[0094] 해당 기술분야에서 통상의 지식을 가진 자들은 추가로, 본 명세서의 개시와 관련하여 설명된 다양한 예시적인 로직 블록들, 모듈들, 회로들 및 알고리즘 단계들이 전자 하드웨어, 소프트웨어/펌웨어, 또는 이들의 결합들로 구현될 수 있음을 인식할 것이다. 이러한 하드웨어와 소프트웨어/펌웨어의 상호 호환성을 명확히 설명하기 위해, 각종 예시적인 컴포넌트들, 블록들, 모듈들, 회로들 및 단계들은 일반적으로 이들의 기능과 관련하여 위에서 설명되었다. 이러한 기능이 하드웨어로 구현되는지/소프트웨어로 구현되는지/펌웨어로 구현되는지는 전체 시스템에 부과된 설계 제약들 및 특정 애플리케이션에 좌우된다. 해당 기술분야에서 통상의 지식을 가진 자들은 설명된 기능을 특정 애플리케이션마다 다양한 방식들로 구현할 수도 있지만, 이러한 구현 결정들이 본 개시

ASUS EX2019-p.363
Samsung v. ASUS
IPR2024-00614

의 범위를 벗어나게 하는 것으로 해석되지 않아야 한다.

[0095] 위에서 설명한 방법들의 다양한 동작들은 대응하는 기능들을 수행할 수 있는 임의의 적당한 수단에 의해 수행될 수 있다. 이러한 수단은 회로, 주문형 집적 회로(ASIC: application specific integrated circuit) 또는 프로세서를 포함하지만 이에 한정된 것은 아닌 다양한 하드웨어 및/또는 소프트웨어/펌웨어 컴포넌트(들) 및/또는 모듈(들)을 포함할 수 있다. 일반적으로, 도면들에 예시된 동작들이 존재하는 경우, 이러한 동작들은 유사한 번호를 가진 대응하는 상대 수단 + 기능 컴포넌트들을 가질 수 있다. 예를 들어, 도 6과 도 7에 예시된 블록들(600, 700)은 도 6a와 도 7a에 예시된 수단 + 기능 블록들(600A(602A, 604A, 606A, 608A) 및 700A(702A, 704A, 706A, 708A))에 대응한다.

[0096] 본 명세서의 개시와 관련하여 설명된 다양한 예시적인 로직 블록들, 모듈들 및 회로들은 범용 프로세서, 디지털 신호 프로세서(DSP: digital signal processor), 주문형 집적 회로(ASIC), 필드 프로그래밍 가능한 게이트 어레이(FPGA: field programmable gate array) 또는 다른 프로그래밍 가능한 로직 디바이스, 이산 게이트 또는 트랜지스터 로직, 이산 하드웨어 컴포넌트들, 또는 본 명세서에서 설명된 기능들을 수행하도록 설계된 이들의 임의의 결합으로 구현 또는 수행될 수 있다. 범용 프로세서는 마이크로프로세서일 수도 있지만, 대안으로 프로세서는 임의의 종래 프로세서, 제어기, 마이크로컨트롤러 또는 상태 머신일 수도 있다. 프로세서는 또한 컴퓨팅 디바이스들의 결합, 예를 들어 DSP와 마이크로프로세서의 결합, 다수의 마이크로프로세서들, DSP 코어와 결합된 하나 또는 그보다 많은 마이크로프로세서들, 또는 임의의 다른 이러한 구성으로서 구현될 수도 있다.

[0097] 본 명세서의 개시와 관련하여 설명된 방법 또는 알고리즘의 단계들은 직접 하드웨어로, 프로세서에 의해 실행되는 소프트웨어/펌웨어 모듈로, 또는 이들의 결합들로 구현될 수 있다. 소프트웨어/펌웨어 모듈은 RAM 메모리, 플래시 메모리, ROM 메모리, EPROM 메모리, EEPROM 메모리, 레지스터들, 하드디스크, 착탈식 디스크, CD-ROM, 또는 해당 기술분야에 공지된 임의의 다른 형태의 저장 매체에 상주할 수 있다. 예시적인 저장 매체는 프로세서가 저장 매체로부터 정보를 읽고 그리고/또는 저장 매체에 정보를 기록할 수 있도록 프로세서에 연결된다. 대안으로, 저장 매체는 프로세서에 통합될 수도 있다. 프로세서 및 저장 매체는 ASIC에 상주할 수도 있다. ASIC는 사용자 단말에 상주할 수도 있다. 대안으로, 프로세서 및 저장 매체는 사용자 단말에 개별 컴포넌트들로서 상주할 수도 있다.

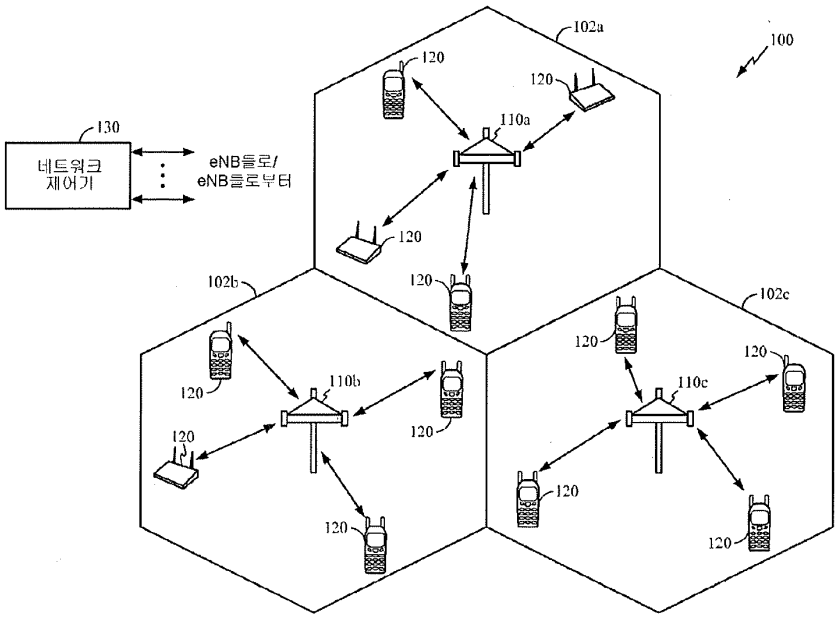
[0098] 하나 또는 그보다 많은 예시적인 설계들에서, 설명된 기능들은 하드웨어, 소프트웨어/펌웨어, 또는 이들의 임의의 결합으로 구현될 수 있다. 소프트웨어/펌웨어로 구현된다면, 이 기능들은 컴퓨터 판독 가능 매체 상에 하나 또는 그보다 많은 명령들 또는 코드로서 저장될 수 있거나 이를 통해 전송될 수도 있다. 컴퓨터 판독 가능 매체는 한 장소에서 다른 장소로 컴퓨터 프로그램의 전달을 용이하게 하는 임의의 매체를 포함하는 통신 매체와 컴퓨터 저장 매체를 모두 포함한다. 저장 매체는 범용 또는 특수 목적용 컴퓨터에 의해 액세스 가능한 임의의 이용 가능한 매체일 수 있다. 한정이 아닌 예시로, 이러한 컴퓨터 판독 가능 매체는 RAM, ROM, EEPROM, CD-ROM 이나 다른 광 디스크 저장소, 자기 디스크 저장소 또는 다른 자기 저장 디바이스들, 또는 명령들이나 데이터 구조들의 형태로 원하는 프로그램 코드 수단을 전달 또는 저장하는데 사용될 수 있으며 범용 또는 특수 목적용 컴퓨터나 범용 또는 특수 목적용 프로세서에 의해 액세스 가능한 임의의 다른 매체를 포함할 수 있다. 또한, 임의의 접속이 컴퓨터 판독 가능 매체로 적절히 지칭된다. 예를 들어, 소프트웨어/펌웨어가 동축 케이블, 광섬유 케이블, 꼬임 쌍선, 디지털 가입자 회선(DSL: digital subscriber line), 또는 적외선, 라디오 및 마이크로파와 같은 무선 기술들을 이용하여 웹사이트, 서버 또는 다른 원격 소스로부터 전송된다면, 동축 케이블, 광섬유 케이블, 꼬임 쌍선, DSL, 또는 적외선, 라디오 및 마이크로파와 같은 무선 기술들이 매체의 정의에 포함된다. 본 명세서에서 사용된 것과 같은 디스크(disk 및 disc)는 콤팩트 디스크(CD: compact disc), 레이저 디스크(laser disc), 광 디스크(optical disc), 디지털 다기능 디스크(DVD: digital versatile disc), 플로피 디스크(floppy disk) 및 블루레이 디스크(Blu-ray disc)를 포함하며, 여기서 디스크(disk)들은 보통 데이터를 자기적으로 재생하는 한편, 디스크(disc)들은 데이터를 레이저들에 의해 광학적으로 재생한다. 상기의 결합들 또한 컴퓨터 판독 가능 매체의 범위 내에 포함되어야 한다.

[0099] 본 개시의 상기의 설명은 해당 기술분야에서 통상의 지식을 가진 임의의 자가 본 개시를 이용하거나 실시할 수 있게 하도록 제공된다. 본 개시에 대한 다양한 변형들은 해당 기술분야에서 통상의 지식을 가진 자들에게 쉽게 명백할 것이며, 본 명세서에 정의된 일반 원리들은 본 개시의 사상 또는 범위를 벗어나지 않으면서 다른 변형들에 적용될 수 있다. 그러므로 본 개시는 본 명세서에서 설명된 예시들 및 설계들로 한정되는 것으로 의도되는 것이 아니라, 본 명세서에 개시된 원리들 및 신규한 특징들에 부합하는 최광의의 범위에 따르는 것이다.

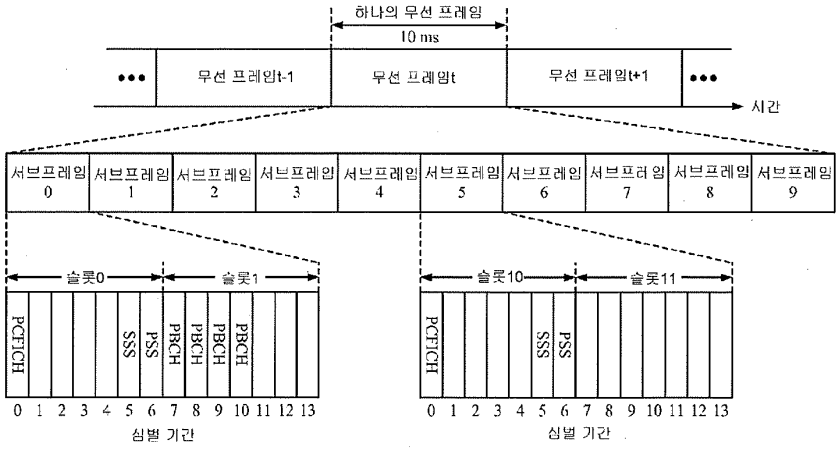
ASUS EX2019-p.364
Samsung v. ASUS
IPR2024-00614

도면

도면1

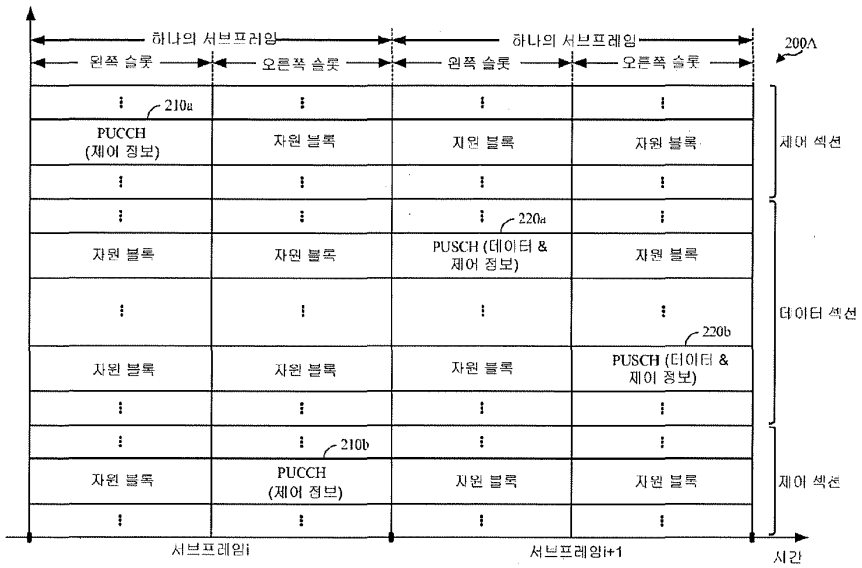


도면2

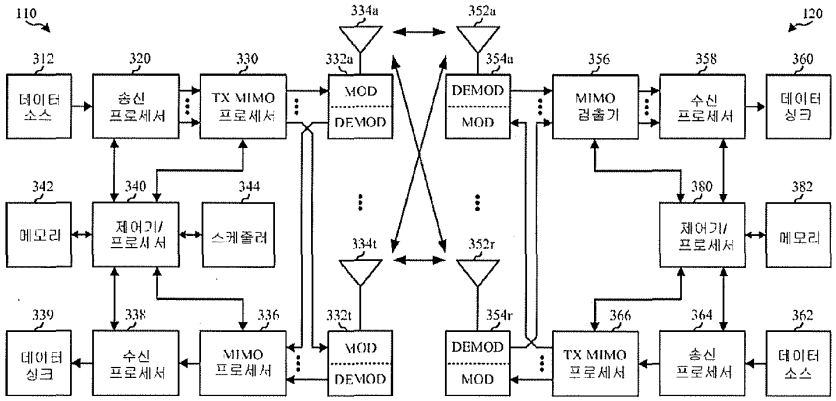


ASUS EX2019-p.365
Samsung v. ASUS
IPR2024-00614

도면2a

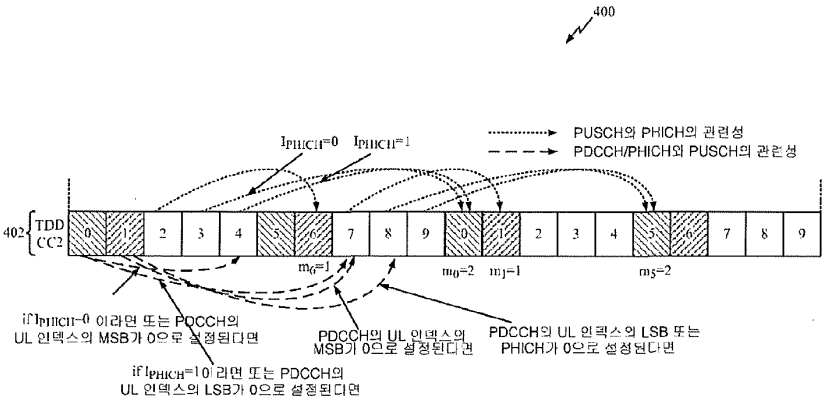


도면3

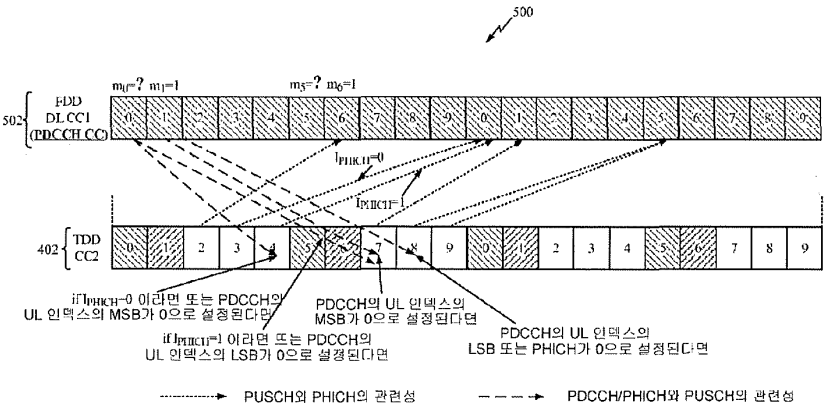


ASUS EX2019-p.366
Samsung v. ASUS
IPR2024-00614

도면4

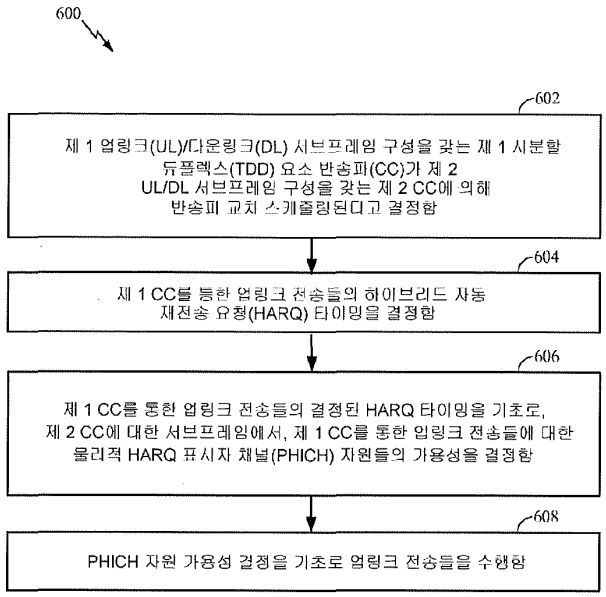


도면5

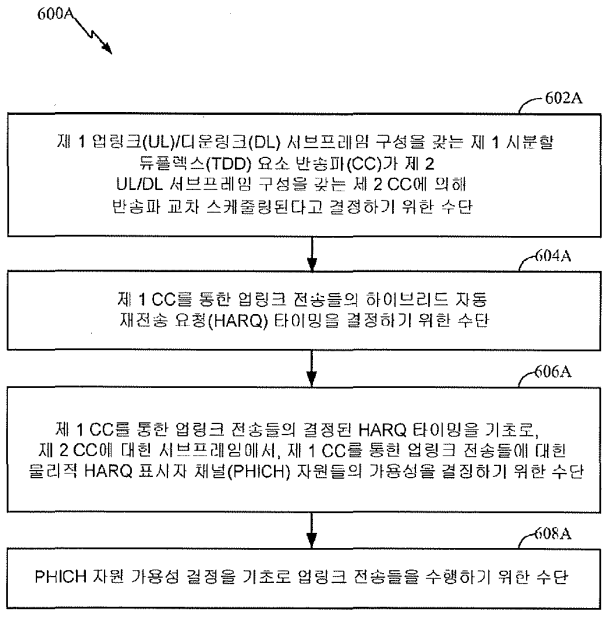


ASUS EX2019-p.367
Samsung v. ASUS
IPR2024-00614

도면6

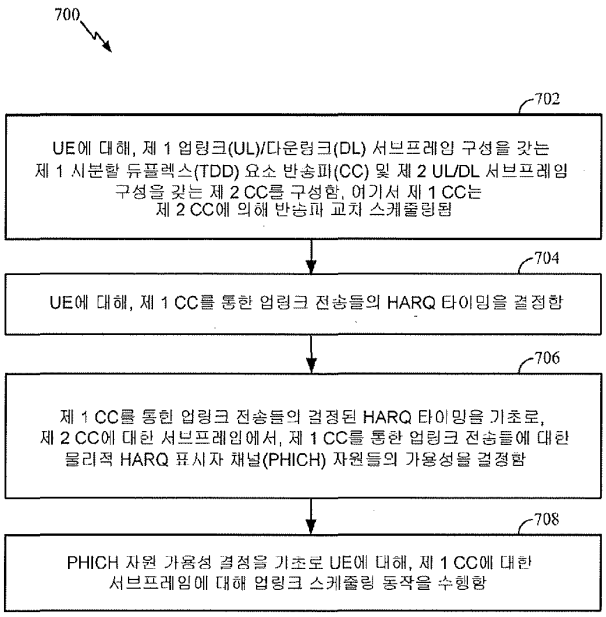


도면6a

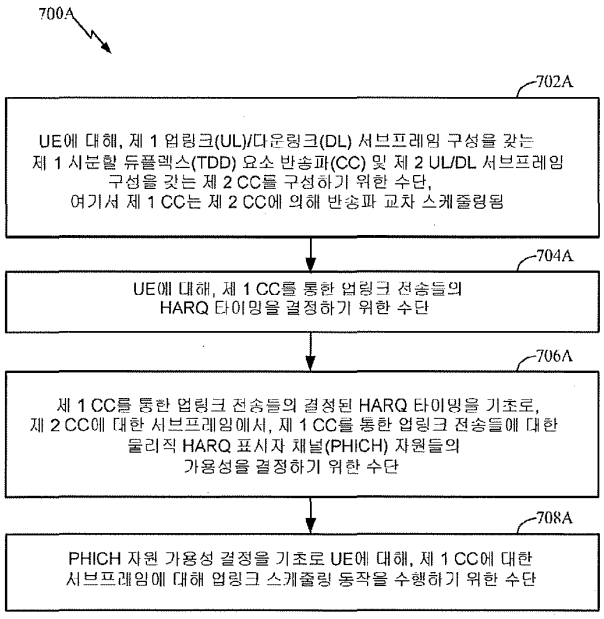


ASUS EX2019-p.368
Samsung v. ASUS
IPR2024-00614

도면7



도면7a



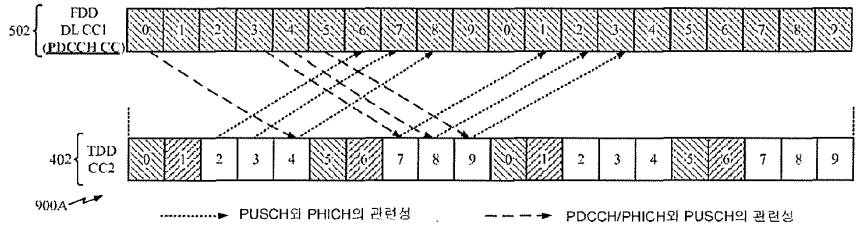
ASUS EX2019-p.369
Samsung v. ASUS
IPR2024-00614

도면8

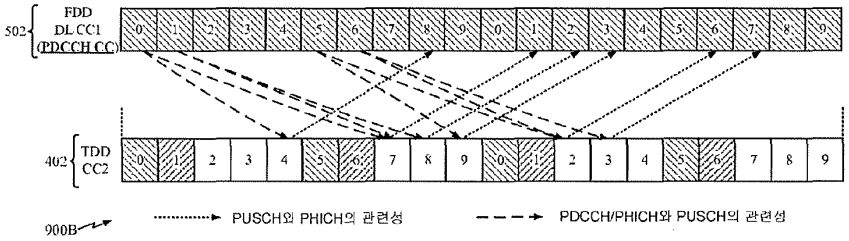
800

	PHICH	#PDCCH	UE 동작
802	ACK	0	두 UL 전송들 모두를 보류함
804	ACK	1	UL 전송들 중 하나(예를 들어, 쌍에서 두 번째 전송)를 보류하고, PDCCH를 기반으로 다른 서브프레임을 전송함
806	NAK	0	두 서브프레임들 모두에 대해 재전송함
808	NAK	1	UL 전송들 중 하나(예를 들어, 쌍에서 두 번째 전송)를 재전송하고, PDCCH를 기반으로 다른 서브프레임을 전송함
810	ACK/NAK	2	대응하는 PDCCH들을 RLQKSDFMH 두 서브프레임들 모두에 대해 전송함

도면9a

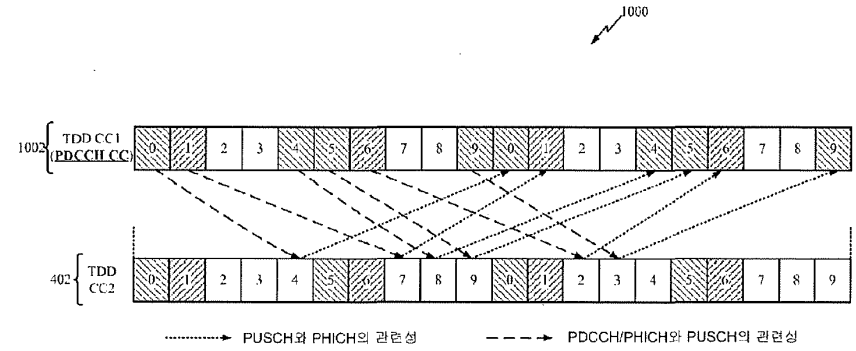


도면9b



ASUS EX2019-p.370
Samsung v. ASUS
IPR2024-00614

도면10

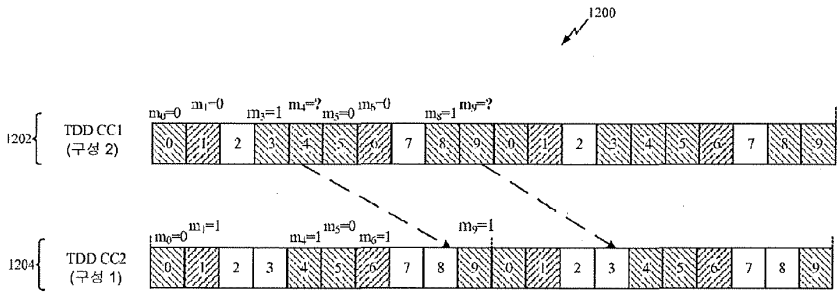


도면11



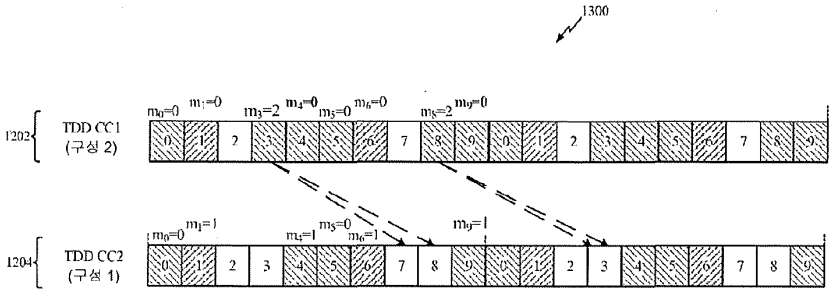
업링크-다운링크 구성	서브프레임 번호									
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
0	2	1	-	-	-	2	1	-	-	-
1	0	1	-	-	1	0	1	-	-	1
2	0	0	-	1	0	0	0	-	1	0
3	1	0	-	-	-	0	0	0	1	1
4	0	0	-	-	0	0	0	0	1	1
5	0	0	-	0	0	0	0	0	1	0
6	1	1	-	-	-	1	1	-	-	1

도면12



ASUS EX2019-p.371
Samsung v. ASUS
IPR2024-00614

도면13



ASUS EX2019-p.372
Samsung v. ASUS
IPR2024-00614

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.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

10948 7590 04/17/2020

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

EXAMINER
PATEL, HARDIKKUMAR D

ART UNIT	PAPER NUMBER
2473	

NOTIFICATION DATE	DELIVERY MODE
04/17/2020	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):

Nokia.IPR@nokia.com
USPTO@hspatent.com

ASUS EX2019-p.373
Samsung v. ASUS
IPR2024-00614

Office Action Summary	**Application No.** 16/099,421	**Applicant(s)** WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	**Art Unit** 2473	**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 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) 29-48 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) 29-48 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 _____ 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: _____.

ASUS EX2019-p.374
Samsung v. ASUS
IPR2024-00614

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

2. Amendment filed on 01/02/2020 has been entered. Claims 29-48 are pending. Claims 1-28 are canceled.

3. Any objections/rejections not repeated for record are withdrawn due to applicant's amendments.

Claim Rejections - 35 USC § 103

1. 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.

2. 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, 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.

3. 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 35 U.S.C. 103 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.

4. Claims 29-48 is/are rejected under 35 U.S.C. 103 as being unpatentable over Lee et a., (US 2011/0310833 A1, herein after Lee) in view of Sun et al., (US 2018/0368176 A1, herein after Sun).

Claims 29, 35 and 43

Lee discloses an apparatus, comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, **(Fig. 12 UE having control unit…the data stored in the UE, interpreted as UE comprises memory, ¶** [0051]**)** to cause the apparatus at least to receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission when there is no uplink data **(the UE may skip the UL resource allocation process that it should perform with the eNB to be allocated a UL resource ¶ [0006]… A new Explicit UL grant is allocated to the UE when no data is detected from the Explicit UL grant. And when data is detected from the Explicit UL grant ¶**

[0013-0017, 0020, 0046-0054]); and determine whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant **(The UE includes a control unit detects a type of an uplink (UL) grant while the UE is periodically allocated a UL grant…¶ [0017-0021, 0046-0052]… the UE 211 transmits the data using the Explicit UL grant in an (n+12)-th frame in step 221 ¶ [0055])**.

Lee does not explicitly disclose the apparatus is requested for UCI for a subframe with the uplink grant…skipping uplink transmission for an uplink grant.

Sun discloses the apparatus is requested for UCI for a subframe with the uplink grant **(in which both UL grant and DL assignment are transmitted to the UE in a same DL subframe, so that combined feedback information related to UL data (to be transmitted in response to the UL grant) and the HARQ ACK/NACK (to be transmitted in response to the DL data related to the DL assignment) can be received by an access node from the UE ¶ [0035])** skipping uplink transmission for an uplink grant **(a skip-padding-up-uplink alternative is introduced (which is disclosed in e.g. R2-156296, R2-157032, R2-157033 available from http://www.3gpp.org/). When the "skipPadding" bit is set and signaled to the UE (which is also referred to as "skipPadding UE") through a RRC signaling or on a separate dynamic grant, the UE is allowed to not transmit at all if there is no data in an UL buffer ¶ [0025]).**

Thus, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Lee using

the features, as taught by Sun in order to improve DTX robustness scheme, ¶ [0035].

Claim 29 encompass limitations that are similar to limitations of claim 35. Thus, it is rejected with the same rationale applied against claim 35 above.

Claim 43 encompass limitations that are similar to limitations of claim 35, except network node is transmitting. However Lee discloses transmitting step in fig. 2. Thus, it is rejected with the same rationale applied against claim 35 above.

Claim 46 encompass limitations that are similar to limitations of claims 35 and 39. Thus, it is rejected with the same rationale applied against claims 35 and 39 above.

Claims 30 and 36,

Lee discloses to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted **(a UL grant mapped to a FAS C-RNTI taking into account the MCS level, the transport block size…¶ [0081, 0015, 0046-0054])**.

Claim 30 encompass limitations that are similar to limitations of claim 36. Thus, it is rejected with the same rationale applied against claim 36 above.

Claims 31 and 37,

Lee discloses wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol

data unit, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block **(the second blind scheduling scheme, when having no data to transmit on a UL, a UE transmits no padding MAC PDT/regardless of the type of a UL grant. In the third blind scheduling scheme, if a UE being allocated a UL grant has no data to transmit on a UL, the UE determines whether to transmit padding MAC PDUs according to the type of a Cell Radio Network Temporary Identifier (C-RNTI)… the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL ¶ [0040-0042, 0054])**.

Claim 31 encompass limitations that are similar to limitations of claim 37. Thus, it is rejected with the same rationale applied against claim 37 above.

Claims 32, 38, 44 and 47,

Lee discloses the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback **(the UE transmits no padding MAC PDUs, the HARQ process between the UE and the eNB may be normally performed ¶ [0060-0066])**.

Claim 32 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claim 44 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claim 47 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claims 33 and 39,

Lee discloses the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted **(a UL grant mapped to a FAS C-RNTI taking into account the MCS level, the transport block size…when having no data to transmit using a UL grant, a UE transmits padding MAC PDUs using the UL grant, thereby causing a waste of UE battery due to the transmission of padding MAC PDUs, a signaling overhead due to the exchange of padding MAC PDUs, and a processing load due to the decoding of padding MAC PDUs by an eNB…¶ [0081, 0015, 0046-0054])**.

Claim 33 encompass limitations that are similar to limitations of claim 39. Thus, it is rejected with the same rationale applied against claim 39 above.

Claims 34, 40, 45 and 48,

Lee discloses the apparatus at least to receive the uplink grant from the network node **(Fig. 2 shows UE receiving UL grant from the enB)**.

Claim 34 encompass limitations that are similar to limitations of claim 40. Thus, it is rejected with the same rationale applied against claim 40 above.

Claim 45 encompass limitations that are similar to limitations of claim 34. Thus, it is rejected with the same rationale applied against claim 34 above.

Claim 48 encompass limitations that are similar to limitations of claim 34. Thus, it is rejected with the same rationale applied against claim 34 above.

Claim 41,

Lee discloses the network node comprises a base station or evolved node B **(Fig. 2 eNB 213)**.

Claim 42,

Lee discloses wherein the apparatus comprises a user equipment **(Fig. 2 UE 211)**.

Response to Arguments

Applicant's arguments with respect to claims 29, 35, 43 and 46 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension

fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARDIKKUMAR D PATEL whose telephone number is (571)270-7886. The examiner can normally be reached on 9AM-5PM Monday-Friday.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang B Yao can be reached on 571-272-3182. 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.

/HARDIKKUMAR D PATEL/
Examiner, Art Unit 2473

Notice of References Cited	Application/Control No. 16/099,421	Applicant(s)/Patent Under Reexamination WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	Art Unit 2473	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-20170311344-A1	10-2017	LEE; Seungmin	H04W72/1289	1/1
*	B	US-20110310833-A1	12-2011	Lee; Ok-Seon	H04W74/008	370/329
*	C	US-20180368176-A1	12-2018	Sun; Ying	H04W76/28	1/1
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	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.

ASUS EX2019-p.384
Samsung v. ASUS
IPR2024-00614

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

✓	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	09/27/2019	04/13/2020							
	1	-	-							
	2	-	-							
	3	-	-							
	4	-	-							
	5	-	-							
	6	-	-							
	7	-	-							
	8	-	-							
	9	-	-							
	10	-	-							
	11	-	-							
	12	-	-							
	13	-	-							
	14	-	-							
	15	-	-							
	16	-	-							
	17	-	-							
	18	-	-							
	19	-	-							
	20	-	-							
	21	-	-							
	22	-	-							
	23	-	-							
	24	-	-							
	25	-	-							
	26	-	-							
	27	-	-							
	28	-	-							
	29	✓	✓							
	30	✓	✓							
	31	✓	✓							
	32	✓	✓							
	33	✓	✓							
	34	✓	✓							
	35	✓	✓							
	36	✓	✓							
	37	✓	✓							
	38	✓	✓							
	39	✓	✓							
	40	✓	✓							
	41	✓	✓							
	42	✓	✓							

ASUS EX2019-p.385
Samsung v. ASUS
IPR2024-00614

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

CLAIM		DATE								
Final	Original	09/27/2019	04/13/2020							
	43	✓	✓							
	44	✓	✓							
	45	✓	✓							
	46	✓	✓							
	47	✓	✓							
	48	✓	✓							

ASUS EX2019-p.386
Samsung v. ASUS
IPR2024-00614

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	Art Unit
	HARDIKKUMAR D PATEL	2473

CPC - Searched*		
Symbol	Date	Examiner
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02	09/27/2019	HDP

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
Inventor Search - Search history print out	09/27/2019	HDP
EAST (US-PGPUB, USPAT, USOCR, EPO,) - See East Search History Print out	09/27/2019;04/13/2020	HDP
text search only see search history	09/27/2019	HDP
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02-text search only see search history	09/27/2019	HDP

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

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.387
Samsung v. ASUS
IPR2024-00614

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Chunli Wu CONF. NO.: 8013
SERIAL NO.: 16/099,421 ART UNIT: 2473
FILED: November 6, 2018 EXAMINER: Hardikkumar D. Patel
TITLE: Methods and Apparatues for Skipping Transport Block Transmission Depending on Uplink Control Information Transmission
ATTORNEY DOCKET NO.: 800.2735.U1(US)

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

Information Disclosure Statement
(37 C.F.R. §1.97(c))

Sir:

The following information is being disclosed to the U.S. Patent and Trademark Office as information that may be material to the examination of the above-identified patent application.

The enclosed Form PTO-1449 lists documents cited in an Office Action issued in the corresponding Korean Patent Application No. 2018-7035878, dated December 23, 2019. Also enclosed is a copy of the Korean Office Action.

☒ Each item of information contained in this Information Disclosure Statement was cited in a communication from a

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

ASUS EX2019-p.388
Samsung v. ASUS
IPR2024-00614

foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement, or

☐ No item of information contained in this 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 statement after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this Statement.

The filing of this Statement is not to be construed as a representation that a search has been made regarding the claimed invention (37 C.F.R. §1.97(g)) or that no other possible material information exists. In addition, the filing of this Statement is not to be construed to be an admission that the information cited in the Statement is, or is considered to be, material to patentability (37 C.F.R. §1.97(h)).

Respectfully submitted,

John F. Gulbin January 9, 2020

John F. Gulbin (Reg. No. 33,180) Date

Customer No.: 10948
Harrington & Smith, Attorneys At Law, LLC
4 Research Drive
Shelton, CT 06484-6212
203-925-9400

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

ASUS EX2019-p.389
Samsung v. ASUS
IPR2024-00614

INFORMATION DISCLOSURE CITATION FORM FOR PATENT APPLICATION (FORM PTO-1449) (Substitute)	Docket No.: 800.2735.U1(US) Serial No.: 16/099,421 Applicant(s): Chunli Wu Filing Date: November 6, 2018 Group: 2473

U.S. PATENT DOCUMENTS

Examiner Initials	Document Number (Number-Kind Code)	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant	Class	Sub-class
	US-2013/0034028 A1	02-07-2013	Chen et al.	370	280
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				
	US-				

FOREIGN PATENT DOCUMENTS

Examiner Initials	Document Number (Country Code-Number-Kind Code)	Publication Date (MM-DD-YYYY)	Name Of Patentee of Applicant	Translation? Yes/No/n/a
	KR-2014/0043148 A	04-08-2014	Qualcomm Incorporated	
	- -			
	- -			
	- -			
	- -			
	- -			

OTHER DOCUMENTS (Author (Capitalize), Title, Date, Pages, Etc., if known)

	"Considerations on skipping UL padding transmissions", Sequans Communications, 3GPP TSG-RAN WG2 #93bis, R2-162735, April 2016, 7 pages

Examiner's Signature: /HARDIKKUMAR D PATEL/ Date Considered: 04/13/2020

Initial if reference was considered, whether or not citation is in conformance with MPEP. Mark through citation if not considered. Include a copy of this citation form with your next correspondence to the Applicant(s).

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.D.P/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	131	(skip$3) near5 (uplink reserve$1 near3 link) same grant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/04/13 12:39
L2	31	l1 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2020/04/13 12:42
L3	19	l2 and (uci (uplink near6 control near4 (information transmi$5)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2020/04/13 13:37
S1	2472	((("NOKIA") near3 ("TECHNOLOGIES") near3 ("OY"))).AS,AANM.	USPAT	OR	ON	2019/09/27 07:53
S2	119	((("WU") near3 ("Chunli"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/09/27 07:53
S3	0	"2018142220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S4	0	"20181042220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S5	2	"20110310833"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S6	14040	(ue mobile terminal (user near3 equipment)) with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:06

S7	2414	(ue mobile terminal (user near3 equipment)) with request$3 with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:07
S8	1534	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:10
S9	1047	S8 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:10
S10	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:12
S11	521	S10 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S12	271	S10 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S13	194	S11 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S14	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 11:37
S15	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station) and S14	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 11:37
S16	366	(H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02).cpc. and S15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2019/09/27 11:39

			DERWENT; IBM_TDB			

EAST Search History (Interference)

<This search history is empty>

4/13/2020 2:01:22 PM
C:\Users\hpatel5\Documents\EAST\Workspaces\16099421-mthd and aprts for skipping transport blocks tx depending on UL.wsp

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
800.2735.U1(US)	16/099,421	11/06/2018
First Named Inventor:	**Title:**	
Chunli WU	Methods and Apparatuses for Skipping Transport Block Transmission Depending on Uplink Control Information Transmission	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
    - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
    - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
        - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
        - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
            - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
            - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/John F. Gulbin/	July 8, 2020
Name (Print/Typed) John F. Gulbin	**Practitioner Registration No.** 33,180

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

Electronic Acknowledgement Receipt

EFS ID:	39940744
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Cathy Sturmer
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	08-JUL-2020
Filing Date:	06-NOV-2018
Time Stamp:	11:39:09
Application Type:	U.S. National Stage under 35 USC 371

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	Response After Final Action	AmendmentAF_07-08-2020.pdf	364585 18d2ae24d14c801d92038065658136a6c5d70bbd	no	9
Warnings:					

Information:					
2	After Final Consideration Program Request	AFCPPRequest_07-08-2020.pdf	104140 d1f83cfc9862171b38eb3f1ac6e61a59e00a06da	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	468725	

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 U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1(US)
CONFIRMATION NO.:	8013
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

RESPONSE TO FINAL ACTION

SIR:

This is submitted in response to the final Office Action of April 17, 2020 on the above-identified application. It is being submitted prior to the close of the shortened statutory period for response set in the action. As such, no extension of time is believed to be necessary. In the event that the undersigned attorney is mistaken on this point, please consider this to be a petition for an extension of time, and charge Deposit Account No. 50-1924 for the fee required under 37 C.F.R. §1.17(a).

Please amend the application as shown below.

AMENDMENTS TO THE CLAIMS:

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

Listing of Claims:

1. to 28. (Canceled)

29. (Previously presented) A method comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission for an uplink grant when there is no uplink data; and

determining whether the user equipment is requested for uplink control information transmission for a subframe with the uplink grant.

30. (Currently amended) The method according to claim 29, wherein, when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block regardless of whether there is uplink data to be transmitted.

31. (Previously presented) The method according to claim 29, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, skipping generating a transport block.

32. (Previously presented) The method according to claim 29, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

ASUS EX2019-p.398
Samsung v. ASUS
IPR2024-00614

33. (Previously presented) The method according to claim 29, further comprising transmitting a transport block to the network node regardless of whether there is uplink data to be transmitted.

34. (Previously presented) The method according to claim 29, further comprising receiving the uplink grant from the network node.

35. (Previously presented) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission for an uplink grant when there is no uplink data; and

determine whether the apparatus is requested for uplink control information transmission for a subframe with the uplink grant.

36. (Currently amended) The apparatus according to claim 35, wherein, when it is determined that the apparatus is requested for the uplink control information transmission for the subframe with the uplink grant, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted.

37. (Previously presented) The apparatus according to claim 35, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer

ASUS EX2019-p.399
Samsung v. ASUS
IPR2024-00614

status report only protocol data unit, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

38. (Previously presented) The apparatus according to claim 35, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

39. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted.

40. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

41. (Currently amended) The apparatus according to claim 35, wherein the ~~network node comprises a base station or evolved node B~~ uplink control information comprises an aperiodic channel quality indicator.

42. (Previously presented) The apparatus according to claim 35, wherein the apparatus comprises a user equipment.

43. (Previously presented) A method comprising:

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

ASUS EX2019-p.400
Samsung v. ASUS
IPR2024-00614

receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

44. (Previously presented) The method according to claim 43, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

45. (Previously presented) The method according to claim 43, further comprising transmitting uplink grant to the at least one user equipment.

46. (Previously presented) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

transmit a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receive, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment.

47. (Previously presented) The apparatus according to claim 46, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

ASUS EX2019-p.401
Samsung v. ASUS
IPR2024-00614

48. (Previously presented) The apparatus according to claim 46, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit uplink grant to the at least one user equipment.

ASUS EX2019-p.402
Samsung v. ASUS
IPR2024-00614

REMARKS

This is submitted in response to the final Office Action of April 17, 2020 on the above-identified application. Reconsideration of the claims as amended above, in view of the comments to follow, is respectfully requested.

Claims 29 to 48 are pending in the application. In the action, all claims were finally rejected on the basis of the prior art.

Specifically, all claims were finally rejected under 35 U.S.C. §103 as being unpatentable for obviousness over U.S. Publication No. US 2011/0310833 A1 to Lee et al. (hereinafter Lee) in view of U.S. Publication No. US 2018/0368176 A1 to Sun et al. (hereinafter Sun).

The Examiner will note that, in the preceding amendments, amendments have been made to several of the dependent claims. Entry of the amendments is respectfully requested.

According to the present subject matter, as exemplified by independent claim 29, that claim is concerned with receiving, by a user equipment, a configuration of skipping uplink transmission for an uplink grant when there is no uplink data, and determining whether to still use a subframe with the uplink grant to transmit uplink control information although it is configured to skip the UL transmission.

All claims, including independent claims 29, 35, 43, and 46, were rejected as being unpatentable for obviousness over Lee in view of Sun.

Lee discloses a system and a method which are said to minimize power consumption, signaling overhead, and processing load in blind scheduling in a mobile communication system. A user equipment (UE) detects a type of an uplink (UL) grant while it is periodically allocated the UL grant. If there is no data to transmit using the UL grant, the UE determines whether to transmit a padding Medium Access Control (MAC) Protocol Data Unit (PDU) to an Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Node B (eNB) using the UL grant according to the type of the UL grant.

ASUS EX2019-p.403
Samsung v. ASUS
IPR2024-00614

In Lee, if there is no UL data, the eNB may allocate a new grant to the UE, and send HARQ to the UE.

However, in Lee, there is neither sending uplink control information by the UE, nor determining whether to send it using the subframe with the uplink grant, although it is configured to skip the uplink transmission.

Newly cited Sun discloses skipping padding in UL in paragraph [0025]. Thus, instead of "legacy UE" where UE had to fill in with padding data and transmit even if it didn't have data in the buffer, Rel.-13 allowed the UE not to transmit anything at all when there is no UL data in the buffer.

Then, in paragraph [0035]. Sun says that the network transmits to a UE an UL grant and a DL assignment in the same subframe. The motivation to do is that the UE can then transmit combined feedback information related to UL data and HARQ ACK/NACK in response to DL data.

Sun does not disclose that, although the UE skips the uplink transmission for an uplink grant, the UE may still transmit uplink control information in a subframe with the uplink grant, that is, with the uplink grant for which it has skipped the uplink transmission. Nor does Lee disclose this.

As a consequence, independent claims 29, 35, 43, and 46 are respectfully submitted to be patentable over the combined teachings of Lee and Sin, as are the dependent claims, which further limit the subject matter claimed in their respective independent base claims.

ASUS EX2019-p.404
Samsung v. ASUS
IPR2024-00614

In view of the above, reconsideration of claims 29 to 48, as amended, is respectfully requested, and their early allowance is earnestly sought.

Respectfully submitted,

/John F. Gulbin/	July 8, 2020
John F. Gulbin Registration No. 33,180	Date

Customer No.: 10948

HARRINGTON & SMITH, ATTORNEYS AT LAW, LLC
4 Research Drive
Shelton, CT 06484-6212

Telephone: (203) 925-9400 ext. 15
Facsimile: (203) 944-0245
E-mail: jgulbin@hspatent.com

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or is being transmitted electronically to the United States Patent and Trademark Office.

Cathy Sturner	7/8/2020
Name of Person Making Deposit Cathy Sturner	Date

ASUS EX2019-p.405
Samsung v. ASUS
IPR2024-00614

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. 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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/099,421	Filing Date 11/06/2018	☐ 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	07/08/2020	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	*** 4	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(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".	/JACQUELYN L WILLIAMS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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

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.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

10948 7590 07/28/2020

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

EXAMINER
PATEL, HARDIKKUMAR D

ART UNIT	PAPER NUMBER
2473	

NOTIFICATION DATE	DELIVERY MODE
07/28/2020	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):

USPTO@hspatent.com

ASUS EX2019-p.407
Samsung v. ASUS
IPR2024-00614

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 16/099,421	**Applicant(s)** WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	**Art Unit** 2473	**AIA (FITF) Status** Yes

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

THE REPLY FILED 08 July 2020 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☑ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires ____ months from the mailing date of the final rejection.
   b) ☑ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection.The current period for reply expires ____ months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: _____ (See 37CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicants reply has overcome the following rejection(s): _____
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☐ For purposes of appeal, the proposed amendment(s):(a)☐ will not be entered, or (b)☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☑ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☑ Other: See attached pto 413 and PTO 2323.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed:_____.
    Claim(s) objected to:_____.
    Claim(s) rejected:29-48.
    Claim(s) withdrawn from consideration:_____.

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.408
Samsung v. ASUS
IPR2024-00614

Continuation of REQUEST FOR RECONSIDERATION/OTHER 12. The request for reconsideration has been considered but does NOT place the application in condition for allowance because: Applicant AFCP 2.0 request has been denied due to improper request, see PTO 2323. Applicant argues on page 8 of the remarks that Sun does not disclose UE skips the UL transmission for an UL grant, the UE may still transmit UCI in a subframe with the UL grant, that is with the UL grant for which it has skipped the UL transmission.
However, Examiner respectfully disagree with Applicant. Sun does disclose above discussed features in paragraphs 25, 35, 95 and 96 that that Skippadding UE consists in that there will be no transmission on the UL shared channel if there are no data in the UL buffer...When the "skipPadding" bit is set and signaled to the UE (which is also referred to as "skipPadding UE") through a RRC signaling or on a separate dynamic grant, the UE is allowed to not transmit at all if there is no data in an UL buffer.

Examiner-Initiated Interview Summary	Application No. 16/099,421	Applicant(s) WU, Chunli		
	Examiner HARDIKKUMAR D PATEL	Art Unit 2473	AIA (First Inventor to File) Status Yes	Page 1 of 1

All participants (applicant, applicants representative, PTO personnel):

1. HARDIKKUMAR D PATEL (Primary Examiner); Telephonic

2. JOHN F. GULBIN (Attorney); Telephonic

Date of Interview: 23 July 2020

Issues Discussed:

Other:
Examiner attempted to contact Mr. Gulbin and left a Voicemail in regards to notify that the AFCP 2.0 request is an improper request; therefore, AFCP 2.0 will not be accepted. Reason: According to guidelines at least one non-broadening amendment should be made in the independent claim for it to be qualify.

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview .

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

AFCP 2.0 Decision

Application No.	Applicant(s)	
16/099,421	WU, Chunli	
Examiner	**Art Unit**	**AIA (FITF) Status**
HARDIKKUMAR D PATEL	2473	Yes

This is in response to the After Final Consideration Pilot request filed 08 July 2020.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☑ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ The request is not the first proper AFCP 2.0 request submitted in response to the most recent final rejection.

   ☑ Other: See attached PTO 413.

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☐ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action . See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other: _____

   Examiner Note: Please attach an interview summary when necessary as described above.

ASUS EX2019-p.411
Samsung v. ASUS
IPR2024-00614

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1(US)
CONFIRMATION NO.:	8013
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

RESPONSE TO FINAL ACTION

SIR:

This is submitted in response to the final Office Action of April 17, 2020 on the above-identified application. It is being submitted prior to the close of the shortened statutory period for response set in the action. As such, no extension of time is believed to be necessary. In the event that the undersigned attorney is mistaken on this point, please consider this to be a petition for an extension of time, and charge Deposit Account No. 50-1924 for the fee required under 37 C.F.R. §1.17(a).

Please amend the application as shown below.

DO NOT ENTER: /H.D.P/

PTO/SB/30 (11-17)
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 contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	16/099,421
Filing Date	11/06/2018
First Named Inventor	Chunli Wu
Art Unit	2473
Examiner Name	Hardikkumar D. Patel
Attorney Docket Number	800.2735.U1(US)

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☑ Enclosed

      i. ☑ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☐ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

   a. ☑ The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 50-1924.

      i. ☑ RCE fee required under 37 CFR 1.17(e)

      ii. ☑ Extension of time fee (37 CFR 1.136 and 1.17)

      iii. ☐ Other _____

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

   d. ☐ Payment by EFS-Web

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/John F. Gulbin/	Date	07/31/2020
Name (Print/Type)	John F. Gulbin	Registration No.	33,180

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office (USPTO), deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the USPTO on the date shown below.

Signature			
Name (Print/Type)	Cathy Sturmer	Date	07/31/2020

This collection of information is required by 37 CFR 1.114. 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: Mail Stop RCE, 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.

Electronic Patent Application Fee Transmittal

Application Number:	16099421
Filing Date:	06-Nov-2018
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Filer:	Mark F. Harrington/Cathy Sturmer
Attorney Docket Number:	800.2735.U1(US)

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt

EFS ID:	40160179
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Cathy Sturmer
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	31-JUL-2020
Filing Date:	06-NOV-2018
Time Stamp:	11:16:44
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$200
RAM confirmation Number	E20207UB17067077
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		AmendmentRCE_07-31-2020.pdf	499275 675fcbfc212d2b962d6c538fdc7e207a5ab3309f	yes	10
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Request for Continued Examination (RCE)		1	1	
	Amendment Submitted/Entered with Filing of CPA/RCE		2	10	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31324 8a2a03deb5715a25628e0ddb37572a4a323f0f7d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	530599		

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 U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1(US)
CONFIRMATION NO.:	8013
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

SUBMISSION UNDER 37 C.F.R. §1.114

SIR:

This is a "Submission under 37 C.F.R. §1.114" in response to the Advisory Action of July 28, 2020 on the above-identified application. The Advisory Action related to Applicant's response of July 8, 2020 to the final Office Action of April 17, 2020. The present Submission is being made during the first month following the close of the shortened statutory period for response set in the final action. As such, a one-month extension of time is believed to be necessary. Please consider this to be a petition for the extension of time, and charge Deposit Account No. 50-1924 for the fee required under 37 C.F.R. §1.17(a)(1).

The amendment submitted in the Applicant's response of July 8, 2020 has not been entered. Please do not enter that amendment, but, instead, amend the application as shown below.

AMENDMENTS TO THE CLAIMS:

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

Listing of Claims:

1. to 28. (Canceled)

29. (Currently amended) A method comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment a configuration of skipping uplink transmission for an uplink grant when there is no uplink data; and

determining whether the user equipment is requested for uplink control information transmission for a subframe with the uplink grant,

wherein the uplink control information comprises an aperiodic channel quality indicator.

30. (Currently amended) The method according to claim 29, wherein, when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block regardless of whether there is uplink data to be transmitted.

31. (Previously presented) The method according to claim 29, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, skipping generating a transport block.

ASUS EX2019-p.419
Samsung v. ASUS
IPR2024-00614

32. (Previously presented) The method according to claim 29, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

33. (Previously presented) The method according to claim 29, further comprising transmitting a transport block to the network node regardless of whether there is uplink data to be transmitted.

34. (Previously presented) The method according to claim 29, further comprising receiving the uplink grant from the network node.

35. (Currently amended) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission for an uplink grant when there is no uplink data; and

determine whether the apparatus is requested for uplink control information transmission for a subframe with the uplink grant,

wherein the uplink control information comprises an aperiodic channel quality indicator.

36. (Currently amended) The apparatus according to claim 35, wherein, when it is determined that the apparatus is requested for the uplink control information transmission for the subframe with the uplink grant, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted.

ASUS EX2019-p.420
Samsung v. ASUS
IPR2024-00614

37. (Previously presented) The apparatus according to claim 35, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

38. (Previously presented) The apparatus according to claim 35, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

39. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted.

40. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

41. (Canceled)

42. (Previously presented) The apparatus according to claim 35, wherein the apparatus comprises a user equipment.

43. (Currently amended) A method comprising:

ASUS EX2019-p.421
Samsung v. ASUS
IPR2024-00614

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receiving, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment,

wherein the uplink control information comprises an aperiodic channel quality indicator.

44. (Previously presented) The method according to claim 43, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

45. (Previously presented) The method according to claim 43, further comprising transmitting uplink grant to the at least one user equipment.

46. (Currently amended) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

transmit a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receive, from the at least one user equipment, a transport block for a subframe with uplink control information transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment,

wherein the uplink control information comprises an aperiodic channel quality indicator.

ASUS EX2019-p.422
Samsung v. ASUS
IPR2024-00614

47. (Previously presented) The apparatus according to claim 46, wherein the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator and hybrid automatic repeat request feedback.

48. (Previously presented) The apparatus according to claim 46, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit uplink grant to the at least one user equipment.

ASUS EX2019-p.423
Samsung v. ASUS
IPR2024-00614

REMARKS

This is a "Submission under 37 C.F.R. §1.114" in response to the Advisory Action of July 28, 2020 on the above-identified application. Consideration of the claims as amended above, in view of the comments to follow, is respectfully requested.

Claims 29 to 48 are pending in the application. In the final Office Action of April 17, 2020, all claims were finally rejected on the basis of the prior art.

Specifically, all claims were finally rejected under 35 U.S.C. §103 as being unpatentable for obviousness over U.S. Publication No. US 2011/0310833 A1 to Lee et al. (hereinafter Lee) in view of U.S. Publication No. US 2018/0368176 A1 to Sun et al. (hereinafter Sun).

The Examiner will note that, in the preceding amendments, amendments have been made to several of the dependent claims, and claim 41 has been canceled. In addition, independent claims 29, 35, 43, and 46 to include the subject matter "wherein the uplink control information comprises an aperiodic channel quality indicator." Support for this subject matter is found in paragraphs [0058] and [0059] on pages 14 and 15 of the specification. Entry of the amendments is respectfully requested.

According to the present subject matter, as exemplified by independent claim 29, that claim is concerned with receiving, by a user equipment, a configuration of skipping uplink transmission for an uplink grant when there is no uplink data, and determining whether to still use a subframe with the uplink grant to transmit uplink control information although it is configured to skip the UL transmission. The uplink control information comprises an aperiodic channel quality indicator.

All claims, including independent claims 29, 35, 43, and 46, were rejected as being unpatentable for obviousness over Lee in view of Sun.

Lee discloses a system and a method which are said to minimize power consumption, signaling overhead, and processing load in blind scheduling in a mobile communication system. A user equipment (UE) detects a type of an uplink (UL) grant while it is periodically allocated the UL grant. If there is no data to transmit using the UL grant, the UE

ASUS EX2019-p.424
Samsung v. ASUS
IPR2024-00614

determines whether to transmit a padding Medium Access Control (MAC) Protocol Data Unit (PDU) to an Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Node B (eNB) using the UL grant according to the type of the UL grant.

In Lee, if there is no UL data, the eNB may allocate a new grant to the UE, and send HARQ to the UE.

However, in Lee, there is neither sending uplink control information by the UE, nor determining whether to send it using the subframe with the uplink grant, although it is configured to skip the uplink transmission. And there is no teaching that the uplink control information comprises an aperiodic channel quality indicator.

Sun discloses skipping padding in UL in paragraph [0025]. Thus, instead of "legacy UE" where UE had to fill in with padding data and transmit even if it didn't have data in the buffer, Rel.-13 allowed the UE not to transmit anything at all when there is no UL data in the buffer.

Then, in paragraph [0035]. Sun says that the network transmits to a UE an UL grant and a DL assignment in the same subframe. The motivation to do is that the UE can then transmit combined feedback information related to UL data and HARQ ACK/NACK in response to DL data.

Sun does not disclose that, although the UE skips the uplink transmission for an uplink grant, the UE may still transmit uplink control information in a subframe with the uplink grant, that is, with the uplink grant for which it has skipped the uplink transmission. Nor does Lee disclose this. And Sun does not teach that the uplink control information comprises an aperiodic channel quality indicator.

As a consequence, independent claims 29, 35, 43, and 46 are respectfully submitted to be patentable over the combined teachings of Lee and Sin, as are the dependent claims, which further limit the subject matter claimed in their respective independent base claims.

ASUS EX2019-p.425
Samsung v. ASUS
IPR2024-00614

In view of the above, consideration of claims 29 to 40, and 42 to 48, as amended, is respectfully requested, and their early allowance is earnestly sought.

Respectfully submitted,

/John F. Gulbin/ July 31, 2020

John F. Gulbin Date
Registration No. 33,180

Customer No.: 10948

HARRINGTON & SMITH, ATTORNEYS AT LAW, LLC
4 Research Drive
Shelton, CT 06484-6212

Telephone: (203) 925-9400 ext. 15
Facsimile: (203) 944-0245
E-mail: jgulbin@hspatent.com

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or is being transmitted electronically to the United States Patent and Trademark Office.



7/31/20

Cathy Sturmer Date

ASUS EX2019-p.426
Samsung v. ASUS
IPR2024-00614

Electronic Patent Application Fee Transmittal

Application Number:	16099421
Filing Date:	06-Nov-2018
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Filer:	Mark F. Harrington/Cathy Sturmer
Attorney Docket Number:	800.2735.U1(US)

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1300	1300
		Total in USD ($)		**1300**

Electronic Acknowledgement Receipt

EFS ID:	40160468
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Cathy Sturmer
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	31-JUL-2020
Filing Date:	06-NOV-2018
Time Stamp:	11:33:02
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1300
RAM confirmation Number	E20207UB33167392
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	Fee Worksheet (SB06)	fee-info.pdf	30836 96a378315adc08e6c5f23c686f50490f8ea49ace	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	30836		

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/SB/06 (09-11)
Approved for use through 1/31/2014. 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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/099,421	Filing Date 11/06/2018	☐ 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	07/31/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 19	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 4	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(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".	/VIOLA D ROGERS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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

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.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

10948 7590 09/02/2020

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

EXAMINER
PATEL, HARDIKKUMAR D

ART UNIT	PAPER NUMBER
2473	

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):

USPTO@hspatent.com

ASUS EX2019-p.432
Samsung v. ASUS
IPR2024-00614

Office Action Summary	**Application No.** 16/099,421	**Applicant(s)** WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	**Art Unit** 2473	**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 07/31/2020.

☐ 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) 29-40 and 42-48 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) 29-40 and 42-48 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 _____ 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: _____.

ASUS EX2019-p.433
Samsung v. ASUS
IPR2024-00614

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

2. RCE was filed on 07/31/2020. Claims 29-40, 42-48 are pending. Claims 1-28 and 41 are canceled.

3. Any objections/rejections not repeated for record are withdrawn due to applicant's amendments.

Claim Rejections - 35 USC § 103

1. 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.

2. 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, 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.

3. 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 35 U.S.C. 103 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.

4. Claims 29-40, 42-48 is/are rejected under 35 U.S.C. 103 as being unpatentable over Lee et a., (US 2011/0310833 A1, herein after Lee) in view of Marinier et al., (US 2018/0006791 A1, herein after Marinier) and further in view of Marco (GB2548902A, herein after Marco).

Claims 29, 35, 43 and 46,

Lee discloses an apparatus, comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code are configured, with the at least one processor, **(Fig. 12 UE having control unit…the data stored in the UE, interpreted as UE comprises memory, ¶** [0051]**)** to cause the apparatus at least to receive a configuration message from a network node, wherein the configuration message indicates to the apparatus a configuration of skipping uplink transmission when there is no uplink data **(the UE may skip the UL resource allocation process that it should perform with the eNB to be allocated a UL resource ¶ [0006]… A new Explicit UL grant is allocated to the UE when no data is detected from**

the Explicit UL grant. And when data is detected from the Explicit UL grant ¶ [0013-0017, 0020, 0046-0054]); and determine whether the apparatus is requested for uplink control information transmission for a subframe with uplink grant **(The UE includes a control unit detects a type of an uplink (UL) grant while the UE is periodically allocated a UL grant…¶ [0017-0021, 0046-0052]… the UE 211 transmits the data using the Explicit UL grant in an (n+12)-th frame in step 221 ¶ [0055])**.

Lee does not explicitly disclose the apparatus is requested for UCI for a subframe with the uplink grant…skipping uplink transmission for an uplink grant; wherein the uplink control information comprises an aperiodic channel quality indicator.

Marinier discloses the apparatus is requested for UCI for a subframe with the uplink grant **(the WTRU may always generate HARQ A/N report for such signaling independently of the UCI request (interpreted as apparatus is requested for UCI)…the apparatus is generated HARQ from the reception of a configured uplink grant ¶ [0297]… HARQ-ACK bits need to be transmitted on PUCCH in a single subframe ¶ [0054, 0053])** wherein the uplink control information comprises an aperiodic channel quality indicator **(the UCI request contents may include aperiodic requests… the WTRU may additionally determine from the UCI request that aperiodic uplink feedback should be sent ¶ [0296]).**

Thus, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Lee using

the features, as taught by Marinier in order to efficiently utilizing resources and improving performance ¶ [0061].

Marco discloses skipping uplink transmission for an uplink grant **(The wireless communication device can skip the transmission of uplink padding transmissions from the wireless communication device to the network element when there is a grant but no uplink data, abstract).**

Thus, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify the system of Lee and Marinier using the features, as taught by Marco in order to efficiently reduce latency of uplink transmissions page 1 lines 22-23.

Claim 29 encompass limitations that are similar to limitations of claim 35. Thus, it is rejected with the same rationale applied against claim 35 above.

Claim 43 encompass limitations that are similar to limitations of claim 35, except network node is transmitting. However, Lee discloses transmitting step in fig. 2. Thus, it is rejected with the same rationale applied against claim 35 above.

Claim 46 encompass limitations that are similar to limitations of claims 35 and 39. Thus, it is rejected with the same rationale applied against claims 35 and 39 above.

Claims 30 and 36,

Lee discloses to cause the apparatus at least to generate a transport block regardless of whether there is uplink data to be transmitted **(a UL grant mapped**

to a FAS C-RNTI taking into account the MCS level, the transport block size…¶ [0081, 0015, 0046-0054]).

Claim 30 encompass limitations that are similar to limitations of claim 36. Thus, it is rejected with the same rationale applied against claim 36 above.

Claims 31 and 37,

Lee discloses wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, the at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block **(the second blind scheduling scheme, when having no data to transmit on a UL, a UE transmits no padding MAC PDT/regardless of the type of a UL grant. In the third blind scheduling scheme, if a UE being allocated a UL grant has no data to transmit on a UL, the UE determines whether to transmit padding MAC PDUs according to the type of a Cell Radio Network Temporary Identifier (C-RNTI)… the UE 211 does not need to transmit padding MAC PDUs when it has no data to transmit on a UL ¶ [0040-0042, 0054])**.

Claim 31 encompass limitations that are similar to limitations of claim 37. Thus, it is rejected with the same rationale applied against claim 37 above.

Claims 32, 38, 44 and 47,

Lee discloses the uplink control information comprises at least one of: periodic or aperiodic channel quality indicator or hybrid automatic repeat request feedback **(the UE transmits no padding MAC PDUs, the HARQ process between the UE and the eNB may be normally performed ¶ [0060-0066])**.

Claim 32 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claim 44 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claim 47 encompass limitations that are similar to limitations of claim 38. Thus, it is rejected with the same rationale applied against claim 38 above.

Claims 33 and 39,

Lee discloses the apparatus at least to transmit a transport block to the network node regardless of whether there is uplink data to be transmitted **(a UL grant mapped to a FAS C-RNTI taking into account the MCS level, the transport block size…when having no data to transmit using a UL grant, a UE transmits padding MAC PDUs using the UL grant, thereby causing a waste of UE battery due to the transmission of padding MAC PDUs, a signaling overhead due to the exchange of padding MAC PDUs, and a processing load due to the decoding of padding MAC PDUs by an eNB…¶ [0081, 0015, 0046-0054])**.

Claim 33 encompass limitations that are similar to limitations of claim 39. Thus, it is rejected with the same rationale applied against claim 39 above.

Claims 34, 40, 45 and 48,

Lee discloses the apparatus at least to receive the uplink grant from the network node **(Fig. 2 shows UE receiving UL grant from the enB)**.

Claim 34 encompass limitations that are similar to limitations of claim 40. Thus, it is rejected with the same rationale applied against claim 40 above.

Claim 45 encompass limitations that are similar to limitations of claim 34. Thus, it is rejected with the same rationale applied against claim 34 above.

Claim 48 encompass limitations that are similar to limitations of claim 34. Thus, it is rejected with the same rationale applied against claim 34 above.

Claim 42,

Lee discloses wherein the apparatus comprises a user equipment **(Fig. 2 UE 211)**.

Response to Arguments

Applicant's arguments with respect to claims 29, 35, 43 and 46 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARDIKKUMAR D PATEL whose telephone number is (571)270-7886. The examiner can normally be reached on 9AM-5PM Monday-Friday.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang B Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/HARDIKKUMAR D PATEL/
Examiner, Art Unit 2473

Notice of References Cited	Application/Control No. 16/099,421	Applicant(s)/Patent Under Reexamination WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	Art Unit 2473	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-20110310833-A1	12-2011	Lee; Ok-Seon	H04W52/0209	370/329
*	B	US-20180006791-A1	01-2018	Marinier; Paul	H04L5/0055	1/1
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
*	N	GB-2548902-A	10-2017	GB	OLIVER MARCO	H04W72/1294
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	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.

ASUS EX2019-p.442
Samsung v. ASUS
IPR2024-00614

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

✓	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	09/27/2019	04/13/2020	08/28/2020						
	1	-	-	-						
	2	-	-	-						
	3	-	-	-						
	4	-	-	-						
	5	-	-	-						
	6	-	-	-						
	7	-	-	-						
	8	-	-	-						
	9	-	-	-						
	10	-	-	-						
	11	-	-	-						
	12	-	-	-						
	13	-	-	-						
	14	-	-	-						
	15	-	-	-						
	16	-	-	-						
	17	-	-	-						
	18	-	-	-						
	19	-	-	-						
	20	-	-	-						
	21	-	-	-						
	22	-	-	-						
	23	-	-	-						
	24	-	-	-						
	25	-	-	-						
	26	-	-	-						
	27	-	-	-						
	28	-	-	-						
	29	✓	✓	✓						
	30	✓	✓	✓						
	31	✓	✓	✓						
	32	✓	✓	✓						
	33	✓	✓	✓						
	34	✓	✓	✓						
	35	✓	✓	✓						
	36	✓	✓	✓						
	37	✓	✓	✓						
	38	✓	✓	✓						
	39	✓	✓	✓						
	40	✓	✓	✓						
	41	✓	✓	-						
	42	✓	✓	✓						

ASUS EX2019-p.443
Samsung v. ASUS
IPR2024-00614

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

CLAIM		DATE								
Final	Original	09/27/2019	04/13/2020	08/28/2020						
	43	✓	✓	✓						
	44	✓	✓	✓						
	45	✓	✓	✓						
	46	✓	✓	✓						
	47	✓	✓	✓						
	48	✓	✓	✓						

ASUS EX2019-p.444
Samsung v. ASUS
IPR2024-00614

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	Art Unit
	HARDIKKUMAR D PATEL	2473

CPC - Searched*		
Symbol	**Date**	**Examiner**
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02	09/27/2019	HDP

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**
Inventor Search - Search history print out	09/27/2019	HDP
EAST (US-PGPUB, USPAT, USOCR, EPO,) - See East Search History Print out	09/27/2019;04/13/2020 ;08/28/2020	HDP
text search only see search history	09/27/2019	HDP
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02-text search only see search history	09/27/2019	HDP

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

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.445
Samsung v. ASUS
IPR2024-00614

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	11,504	(uci ((ul uplink) near6 control near4 (information transmi$5))) same (uplink ul) near5 (grant)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2020/08/28 12:37
L2	285	(wtru or Bluetooth or pds or laptop or mn or mt or ms or ue or wtru or ipad or iphone or (mobile near2 (node or device terminal or station or subscrib$4)) or (user near2 (device equip$5) subscriber user unit)) near7 (request$3 permision permission feedback) near7 (uci ((ul uplink) near6 control near4 (information transmi$5))) same (uplink ul) near5 (grant)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2020/08/28 12:42
L3	164	L2 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 13:15
L4	11	L3 and skip$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 13:20
L5	135	(skip$4 jump$3) near6 ((ul uplink) near5 transmission) with ((ul uplink) near4 grant$1)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2020/08/28 14:37
L6	166	(skip$4 jump$3) near6 ((ul uplink) near5 transmission) with ((ul uplink) near4 grant$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 14:37
L7	39	L6 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 14:37

L8	14	L7 and uci	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 14:38
L9	69	(skip$4 jump$3) near6 ((ul uplink)) with ((ul uplink) near4 grant$1) with ("no" near4 (ul uplink) near5 (data information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 14:54
L10	5	L9 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/08/28 14:54
S1	2,472	((("NOKIA") near3 ("TECHNOLOGIES") near3 ("OY"))).AS,AANM.	USPAT	OR	ON	2019/09/27 07:53
S2	119	((("WU") near3 ("Chunli"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/09/27 07:53
S3	0	"2018142220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S4	0	"20181042220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S5	2	"20110310833"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 08:28
S6	14,040	(ue mobile terminal (user near3 equipment)) with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:06
S7	2,414	(ue mobile terminal (user near3 equipment)) with request$3 with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:07
S8	1,534	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI	US-PGPUB; USPAT;	OR	ON	2019/09/27 10:10

		(uplink near3 control near3 (information indication)))	USOCR; EPO; IBM_TDB			
S9	1,047	S8 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:10
S10	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:12
S11	521	S10 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S12	271	S10 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S13	194	S11 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 10:15
S14	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 11:37
S15	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station) and S14	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2019/09/27 11:37
S16	366	(H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02).cpc. and S15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/09/27 11:39
S17	131	(skip$3) near5 (uplink reserve$1 near3 link) same grant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/04/13 12:39
S18	31	S17 and @ad<="20160512"	US-PGPUB; USPAT;	OR	ON	2020/04/13 12:42

			USOCR; EPO; IBM_TDB			
S19	19	S18 and (uci (uplink near6 control near4 (information transmi$5)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	2020/04/13 13:37

EAST Search History (Interference)

<This search history is empty>

8/28/2020 3:10:16 PM
C:\Users\hpatel5\Documents\EAST\Workspaces\16099421-mthd and aprts for skipping transport blocks tx depending on UL.wsp

Electronic Acknowledgement Receipt

EFS ID:	41179621
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Elaine Mian
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	20-NOV-2020
Filing Date:	06-NOV-2018
Time Stamp:	10:40:29
Application Type:	U.S. National Stage under 35 USC 371

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	Amendment Copy Claims/Response to Suggested Claims	Response-11-20-2020.pdf	368435 8dd9d5802d928dbe45f132d1c8788a3b42f939ae	no	12
Warnings:					

Information:	
Total Files Size (in bytes):	368435

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 U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1(US)
CONFIRMATION NO.:	8013
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

RESPONSE TO OFFICE ACTION

SIR:

This is respectfully submitted in response to the Office Action of September 2, 2020 on the above-identified application. The present response is being made prior to the close of the shortened statutory period for response set in the action. As such, no extension of time is believed to be necessary. In the event that the undersigned attorney is mistaken on this point, please consider this to be a petition for an extension of time, and charge Deposit Account No. 50-1924 for the fee required under 37 C.F.R. §1.17(a).

Please amend the application as shown below.

AMENDMENTS TO THE CLAIMS:

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

Listing of Claims:

1. to 28. (Canceled)

29. (Currently amended) A method comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment ~~a configuration of skipping~~ to skip uplink transmission for an uplink grant when there is no uplink data; ~~and~~

determining whether the user equipment is requested for uplink control information transmission for a subframe with the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator;

when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block even when there is no uplink data to be transmitted; and

transmitting the generated transport block and the uplink control information to the network node in the uplink grant on the physical uplink shared channel.

30. (Canceled)

31. (Previously presented) The method according to claim 29, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, skipping generating a transport block.

ASUS EX2019-p.453
Samsung v. ASUS
IPR2024-00614

32. (Currently amended) The method according to claim 29, wherein the uplink control information further comprises at least one of: periodic ~~or aperiodic~~ channel quality indicator and hybrid automatic repeat request feedback.

33. (Canceled)

34. (Previously presented) The method according to claim 29, further comprising receiving the uplink grant from the network node.

35. (Currently amended) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus ~~a configuration of skipping~~ to skip uplink transmission for an uplink grant when there is no uplink data; ~~and~~

determine whether the apparatus is requested for uplink control information transmission for a subframe with the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator;

when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block even when there is no uplink data to be transmitted; and

transmitting the generated transport block and the uplink control information to the network node in the uplink grant on a physical uplink shared channel.

36. (Canceled)

ASUS EX2019-p.454
Samsung v. ASUS
IPR2024-00614

37. (Previously presented) The apparatus according to claim 35, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with uplink grant and the protocol data unit is padding buffer status report only protocol data unit, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

38. (Currently amended) The apparatus according to claim 35, wherein the uplink control information further comprises at least one of: periodic ~~or aperiodic~~ channel quality indicator and hybrid automatic repeat request feedback.

39. (Canceled)

40. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

41. (Canceled)

42. (Previously presented) The apparatus according to claim 35, wherein the apparatus comprises a user equipment.

43. (Currently amended) A method comprising:

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receiving, from the at least one user equipment, a transport block ~~for a subframe with~~ comprising uplink control information ~~transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment~~ in the uplink grant even when there is no

ASUS EX2019-p.455
Samsung v. ASUS
IPR2024-00614

uplink data to be transmitted in the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator.

44. (Currently amended) The method according to claim 43, wherein the uplink control information further comprises at least one of: periodic ~~or aperiodic~~ channel quality indicator and hybrid automatic repeat request feedback.

45. (Previously presented) The method according to claim 43, further comprising transmitting uplink grant to the at least one user equipment.

46. (Currently amended) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

transmit a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receive, from the at least one user equipment, a transport block ~~for a subframe with~~ comprising uplink control information ~~transmission regardless of the configuration for skipping uplink transmission for the at least one user equipment~~ in the uplink grant even when there is no uplink data to be transmitted in the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator.

47. (Currently amended) The apparatus according to claim 46, wherein the uplink control information further comprises at least one of: periodic ~~or aperiodic~~ channel quality indicator and hybrid automatic repeat request feedback.

ASUS EX2019-p.456
Samsung v. ASUS
IPR2024-00614

48. (Previously presented) The apparatus according to claim 46, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit uplink grant to the at least one user equipment.

49. (New) The apparatus according to claim 35, wherein the generated transport block comprises padded zeros multiplexed with the uplink control information.

50. (New) The apparatus according to claim 46, wherein the transport block comprises padded zeros multiplexed with the uplink control information.

51. (New) The apparatus according to claim 35, wherein the type of the UL grant is a dynamic uplink grant.

52. (New) The apparatus according to claim 35, wherein uplink data refers to uplink data from a medium access control layer.

53. (New) The apparatus according to claim 35, wherein determining whether the apparatus is requested for uplink control information transmission for the uplink grant is based on receiving a request for uplink aperiodic channel quality indicator.

ASUS EX2019-p.457
Samsung v. ASUS
IPR2024-00614

REMARKS

This is respectfully submitted in response to the Office Action of September 2, 2020 on the above-identified application. Consideration of the claims as amended above, in view of the comments to follow, is respectfully requested.

Claims 29 to 40, and 42 to 48 are pending in the application. In the Office Action of September 2, 2020, all claims were rejected on the basis of the prior art.

Specifically, all claims were rejected under 35 U.S.C. §103 as being unpatentable for obviousness over U.S. Publication No. US 2011/0310833 A1 to Lee et al. (hereinafter Lee) in view of U.S. Publication No. US 2018/006791 A1 to Marinier et al. (hereinafter Marinier), and further in view of U.K. Publication No. GB 2548902 A to Marco (hereinafter Marco).

At the outset, the present application is concerned, in part, with the reception, by a user equipment (UE), of a configuration for skipping uplink (UL) transmission (i.e. to skip UL transmission) for an uplink grant when there is no uplink data to be sent, and determining whether to use the uplink grant to transmit uplink control information even though the user equipment is configured to skip the UL transmission and there is no UL data to be transmitted. The requested uplink control information comprises an aperiodic channel quality indicator.

More specifically, when aperiodic channel state information (CSI) is requested, the UE generates the transport block (TB), even though the TB only includes padding (zeroes, see new claims 49 and 50) multiplexed with the aperiodic CSI, even when the UE is configured not to send the TB, that is, to ignore the uplink grant, when there is no data to be sent in the subframe for which the UL grant is present.

It should be noted that aperiodic CSI is not the uplink data included in the claims appearing above. Instead, the aperiodic CSI is control information, while UL data is data from MAC layer (see new claim 52). The point is that there is no uplink data present for the uplink transmission even though the UE has received an uplink grant. According to the configuration, the UE *should* skip the UL grant and UL transmission, but, in the present application, the UE still generates the TB, multiplexes the TB with the aperiodic CSI, and finally transmits the TB in the UL grant on the physical uplink shared channel (PUSCH).

ASUS EX2019-p.458
Samsung v. ASUS
IPR2024-00614

Thus, the determination whether to skip the UL transmission or to generate the transport block padded with zeros - in a situation where the UE has received a configuration to skip when there is no uplink data to transmit on the UL grant - is based on whether the UE has uplink control information (UCI) to transmit.

Before turning to the rejections made on the basis of the prior art, the attention of the Examiner is directed to the amendments made on the preceding pages. In those amendments, the subject matter of claims 30 and 33 has been incorporated into claim 29, and claims 30 and 33 have been canceled to avoid any potential redundancy. Similarly, the subject matter of claims 36 and 39 has been incorporated into claim 35, and claims 36 and 39 have been canceled to avoid any potential redundancy. Claims 43 and 46 have been amended to accord with changes being made to claims 29 and 35. Entry of these amendments is respectfully requested.

In addition, the Examiner will note that dependent claims 49 to 56 are being newly presented. Of these, claims 49 to 52 relate to the transport block having padded zeros multiplexed with the uplink control information; each of these claims is dependent from one of the four independent claims 29, 35, 43, and 46. Support for new claims 49 and 50 is found in the specification as filed in paragraph [0032] on page 7; support for new claim 51 is found in the specification as filed in paragraph [0024] on page 6; support for new claim 52 is found in the specification as filed in paragraph [0028] bridging pages 6 and 7; and support for new claim 53 is found in the specification as filed in paragraph [0029] on page 7.

The addition of these five (5) dependent claims will bring the total number of claims in the application up to twenty (20), which is the total number of claims covered by the patent application filing fees.

In the action, all claims were rejected as being unpatentable for obviousness over Lee in view of Marinier, and further in view of Marco.

Lee discloses a system and a method which are said to minimize power consumption, signaling overhead, and processing load in blind scheduling in a mobile communication system. A user equipment (UE) detects a type of an uplink (UL) grant while it is periodically allocated the UL grant. If there is no data to transmit using the UL grant, the UE

ASUS EX2019-p.459
Samsung v. ASUS
IPR2024-00614

determines, according to the type of the UL grant, whether to transmit a padding Medium Access Control (MAC) Protocol Data Unit (PDU) to an Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Node B (eNB) using the UL grant or to skip the transmission.

Lee is the primary reference, teaching that, when there is a UL grant, then, depending on the type of the UL grant, the UE either skips the UL grant or pads the UL grant with zeros, even when there is no data to transmit. When the UL grant is an explicit grant, the UE skips the transmission. When the UL grant is a configured grant, the UE pads the transmission. The configured grant appears to be a periodic grant (semi-persistent scheduling - SPS), see, for example, Lee, paragraph [0048], while an explicit grant is received over the physical downlink control channel (PDCCH) with cell radio network temporary identifier (C-RNTI), see Lee, paragraph [0018]. .

Lee does not disclose or suggest that, even in a case where the UE is configured to skip, the UE generates the transport block (with padded bits). On the contrary, Lee teaches that, for one type of uplink grant (=the explicit grant), the UE is configured to do the padding but, when there is nothing to transmit, the UE skips the transmission of the TB. Therefore, there is no teaching or suggestion in Lee that the UE is configured to skip, but the UE still generates the TB and transmits the transport block, as presently claimed. In the other type of uplink grant of Lee (=the configured grant), the UE is configured to pad (meaning, transmit the zero padded TB) and the UE does so.

Accordingly, there is no teaching or suggestion in Lee that, where the UE is configured to skip, the UE still generates the transport block (TB). In particular, there is no teaching or suggestion of the determination of whether to skip or to generate the TB being based on whether the UE has uplink control information (UCI) to transmit, in a situation where the UE has received a configuration to skip.

Marinier has been cited for disclosing "the apparatus is requested for UCI for a subframe with the uplink grant…wherein the uplink control information comprises an aperiodic channel quality indicator."

ASUS EX2019-p.460
Samsung v. ASUS
IPR2024-00614

Marinier shows a method and apparatus for uplink feedback for operating with a large number of carriers. A method in a wireless transmit/receive unit (WTRU), such as a user equipment (UE) includes receiving a plurality of transport blocks over a set of a plurality of configured carriers, generating hybrid automatic repeat request (HARQ)-acknowledgment (ACK) feedback for the transport blocks and determining a number of HARQ-ACK feedback bits to use for the HARQ-ACK feedback. Further, the WTRU may apply, to the HARQ-ACK feedback bits, Reed-Muller coding on a condition that the number of HARQ-ACK feedback bits is less than or equal to a threshold or convolutional coding on a condition that the number of HARQ-ACK feedback bits is greater than a threshold. The WTRU may then transmit the encoded HARQ-ACK feedback bits. In addition, the WTRU may conditionally append cyclic redundancy check (CRC) bits onto the HARQ-ACK feedback bits, and encode and transmit the CRC bits.

Marinier teaches that WTRU, or UE, may transmit UCI in uplink. The UCI may comprise aperiodic feedback. However, the aperiodic uplink feedback of Marinier does not include the aperiodic channel quality indicator (CQI), as is currently claimed. There may be also different kinds of uplink feedbacks than CQI.

It needs to be noted that what is being claimed is that the UCI is sent together with the generated (zero-padded) transport block, instead of skipping, even when the configuration indicates to skip when there is no UL data to be transmitted. And this is not disclosed in Marinier either.

This is now more clearly expressed in the claims as amended above with the addition of the subject matter: "when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block even when there is no uplink data to be transmitted; and transmitting the generated transport block and the uplink control information to the network node in the uplink grant on a physical uplink shared channel". Marinier is also silent on these features.

Marco has been cited for disclosing skipping uplink transmission for an uplink grant. In Marco, a user equipment has an uplink buffer for storing uplink data to be sent to a

ASUS EX2019-p.461
Samsung v. ASUS
IPR2024-00614

base station in an uplink grant procedure and is configured with a DTX (discontinuous transmission) pattern which allows it to skip the transmission of uplink padding transmissions when there is a grant but no uplink data in the uplink buffer during "off" periods. However, Marco does not disclose or suggest that, when aperiodic channel state information (CSI) is requested, the UE generates and transmits the transport block (TB) comprising the uplink control information, even though the TB only includes padding (zeroes) multiplexed with the aperiodic CSI, and even when the UE is configured not to send the TB, that is, to ignore the uplink grant, when there is no data to be sent in the subframe for which the UL grant is present.

As a consequence, independent claims 29, 35, 43, and 46 are respectfully submitted to be patentable over the combined teachings of Lee, Marinier, and Marco, as are the dependent claims 49 and 50, which relate to the transport block having padded zeros multiplexed with the uplink control information, and which further limit the subject matter claimed in their respective independent base claims. The remaining dependent claims 31, 32, 34, 37, 38, 40, 42, 44, 45, 47, 48, and newly presented claims 51 to 53, are respectfully submitted to be patentable as further limiting the subject matter claimed in their respective independent claims.

In view of the above, consideration of claims 29, 31, 32, 34, 35, 37, 38, 40, and 42 to 48, as amended, and of newly presented claims 49 to 53, is respectfully requested, and their early allowance is earnestly sought.

Respectfully submitted,

John F. Gulbin — November 20, 2020

John F. Gulbin
Registration No. 33,180

Date

Customer No.: 10948

ASUS EX2019-p.462
Samsung v. ASUS
IPR2024-00614

HARRINGTON & SMITH, ATTORNEYS AT LAW, LLC
4 Research Drive
Shelton, CT 06484-6212

Telephone: (203) 925-9400 ext. 15
Facsimile: (203) 944-0245
E-mail: jgulbin@hspatent.com

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or is being transmitted electronically to the United States Patent and Trademark Office.

Elaine F. Nian — 11/30/2020

Name of Person Making Deposit — Date

ASUS EX2019-p.463
Samsung v. ASUS
IPR2024-00614

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. 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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/099,421	Filing Date 11/06/2018	☐ 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	11/20/2020	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	*** 4	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(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.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/SHANDA E ROSS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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

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

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

10948 7590 12/23/2020

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

EXAMINER
PATEL, HARDIKKUMAR D

ART UNIT	PAPER NUMBER
2473	

DATE MAILED: 12/23/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

TITLE OF INVENTION: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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	03/23/2021

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.

ASUS EX2019-p.465
Samsung v. ASUS
IPR2024-00614

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)

10948 7590 12/23/2020

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

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.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

TITLE OF INVENTION: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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	03/23/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, HARDIKKUMAR D	2473	370-329000

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. _____

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ASUS EX2019-p.466
Samsung v. ASUS
IPR2024-00614

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.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

10948 7590 12/23/2020

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

EXAMINER	
PATEL, HARDIKKUMAR D	
ART UNIT	PAPER NUMBER
2473	

DATE MAILED: 12/23/2020

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.

ASUS EX2019-p.467
Samsung v. ASUS
IPR2024-00614

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. 16/099,421	Applicant(s) WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	Art Unit 2473	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 11/20/2020.
   ☐ 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 29, 31, 32, 34, 35, 37, 38, 40, 42-53 renumbered as 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 _____.

/HARDIKKUMAR D PATEL/
Examiner, Art Unit 2473

ASUS EX2019-p.469
Samsung v. ASUS
IPR2024-00614

DETAILED ACTION

1. Amendment was filed on 11/20/2020.

2. Claims 29, 31, 32, 34, 35, 37, 38, 40, 42-53 are pending.

3. Claims 1-28, 30, 33, 36, 39, 41, are cancelled.

4. Claims 29, 31, 32, 34, 35, 37, 38, 40, 42-53 are allowed.

REASONS FOR ALLOWANCE

The present invention is directed to method and apparatuses for skipping transport block transmission depending on uplink control information transmission. Each independent claim identifies the uniquely distinct features: regarding claim 29, when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block even when there is no uplink data to be transmitted: and transmitting the generated transport block and the uplink control information to the network node in the uplink grant on the physical unlink shared channel, in combination with other limitations in the claim.

Each independent claim identifies the uniquely distinct features: regarding claim 43 receiving, from the at least one user equipment, a transport block comprising uplink control information in the uplink grant even when there is no uplink data to be transmitted in the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator, in combination with other limitations in the claim.

The closest prior art, Marinier et al., (US 2018/0006791 A1) disclose conventional way of a wireless transmit/receive unit (WTRU) includes receiving a plurality of transport blocks over a set of a plurality of configured carriers, generating hybrid automatic repeat request (HARQ)-acknowledgment (ACK) feedback for the transport blocks and determining a number of HARQ-ACK feedback bits to use for the HARQ-ACK feedback. Further, the WTRU may apply, to the HARQ-ACK feedback bits, Reed-Muller coding on a condition that the number of HARQ-ACK feedback bits is less than or equal to a threshold or convolutional coding on a condition that the number of HARQ-ACK feedback bits is greater than a threshold, either singularly or in combination, fail to anticipate or render the above features obvious.

The closest prior art, Marco et al., (GB 2548902A) disclose conventional way the configured uplink resources may be released if acknowledgments of a predetermined number of consecutive uplink transmissions have not been received. The wireless communication device may send scheduling requests to the network element at least until detecting a change in Modulation and Coding Scheme (MCS) or power control in uplink grants received at the wireless communication device from the network element. In a further embodiment a wireless communication device which is configured with a Discontinuous Transmission pattern (DTX), wherein the transmission of uplink padding transmissions from the wireless communication device to the network element, either singularly or in combination, fail to anticipate or render the above features obvious.

Claim 35 encompasses limitations that are similar to claim 29. Thus, claim 35 is allowed based on the same reasoning as discussed above.

Claim 46 encompasses limitations that are similar to claim 43. Thus, claim 46 is allowed based on the same reasoning as discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARDIKKUMAR D PATEL whose telephone number is (571)270-7886. The examiner can normally be reached on 9AM-5PM Monday-Friday.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang B Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HARDIKKUMAR D PATEL/
Examiner, Art Unit 2473

Notice of References Cited	Application/Control No. 16/099,421	Applicant(s)/Patent Under Reexamination WU, Chunli	
	Examiner HARDIKKUMAR D PATEL	Art Unit 2473	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-20110310833-A1	12-2011	Lee; Ok-Seon	H04W52/0209	370/329
*	B	US-20180006791-A1	01-2018	Marinier; Paul	H04L1/0061	1/1
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
*	N	GB-2548902-A	10-2017	GB	OLIVER MARCO	H04W72/14
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	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.

ASUS EX2019-p.474
Samsung v. ASUS
IPR2024-00614

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	Art Unit
	HARDIKKUMAR D PATEL	2473

CPC - Searched*		
Symbol	**Date**	**Examiner**
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02	09/27/2019	HDP
H04W72/14 H04L1/0061 H04L1/1664 H04L1/1671 H04L1/1812 H04L1/1854 H04L5/0044 H04L5/0053 H04L5/0064 H04W28/0278 H04W72/0413 H04W72/0446 H04W72/1284 H04W80/02 H04W72/12 H04W56/00 H04W74/08 H04L1/0025 H04W74/0833 H04L5/0007 H04L27/3836;H04W28/06 H04W72/1289 H04W72/04 H04W52/0209 H04L1/1829 H04W72/1268 H04L1/1861 H04W74/008 Y02D70/00 Y02D70/1262 Y02D30/70 H04W76/28 H04L5/0055 H04L5/0053 H04W72/1289 H04L1/0027 H04L2001/125 H04L5/00 H04L1/003 H04L1/0059 H04L1/0073 H04L1/1893 H04W72/02; H04L1/0057 H04L1/1671 H04W52/0216 H04L1/0026 H04L1/0061 H04W72/0413 H04L2001/125 H04L1/00 H04W72/1284 H04W52/02 H04L1/0009 H04W52/365 H04L1/0003 H04W72/1294 H04W72/042 H04W72/0406	12/15/2020	HDP

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.

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.475
Samsung v. ASUS
IPR2024-00614

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

Search Notes		
Search Notes	**Date**	**Examiner**
Inventor Search - Search history print out	09/27/2019	HDP
EAST (US-PGPUB, USPAT, USOCR, EPO,) - See East Search History Print out	09/27/2019;04/13/2020 ;08/28/2020	HDP
text search only see search history	09/27/2019	HDP
H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02-text search only see search history	09/27/2019	HDP
PE2E(US-PGPUB, USPAT, USOCR, EPO,) - See PE2E Search History Print out	12/14/2020	HDP
NPL Search History-Google.com & IP.com	12/14/2020	HDP
H04W72/14 H04L1/0061 H04L1/1664 H04L1/1671 H04L1/1812 H04L1/1854 H04L5/0044 H04L5/0053 H04L5/0064 H04W28/0278 H04W72/0413 H04W72/0446 H04W72/1284 H04W80/02 H04W72/12 H04W56/00 H04W74/08 H04L1/0025 H04W74/0833 H04L5/0007 H04L27/3836;H04W28/06 H04W72/1289 H04W72/04 H04W52/0209 H04L1/1829 H04W72/1268 H04L1/1861 H04W74/008 Y02D70/00 Y02D70/1262 Y02D30/70 H04W76/28 H04L5/0055 H04L5/0053 H04W72/1289 H04L1/0027 H04L2001/125 H04L5/00 H04L1/003 H04L1/0059 H04L1/0073 H04L1/1893 H04W72/02; H04L1/0057 H04L1/1671 H04W52/0216 H04L1/0026 H04L1/0061 H04W72/0413 H04L2001/125 H04L1/00 H04W72/1284 H04W52/02 H04L1/0009 H04W52/365 H04L1/0003 H04W72/1294 H04W72/042 H04W72/0406	12/15/2020	HDP

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	See interference text search history	12/14/2020	HDP

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.476
Samsung v. ASUS
IPR2024-00614

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

CPC						
Symbol					**Type**	**Version**
H04W	/	72	/	14	F	2013-01-01
H04L	/	1	/	1671	I	2013-01-01
H04L	/	5	/	0064	I	2013-01-01
H04L	/	5	/	0044	I	2013-01-01
H04L	/	5	/	0053	I	2013-01-01
H04L	/	1	/	1664	I	2013-01-01
H04W	/	72	/	1284	I	2013-01-01
H04L	/	1	/	1854	I	2013-01-01
H04L	/	1	/	0061	I	2013-01-01
H04L	/	1	/	1812	I	2013-01-01
H04W	/	28	/	0278	I	2013-01-01
H04W	/	72	/	0413	I	2013-01-01
H04W	/	72	/	0446	I	2013-01-01
H04W	/	80	/	02	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	14 December 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3B

U.S. Patent and Trademark Office — Part of Paper No.: 20201214

ASUS EX2019-p.477
Samsung v. ASUS
IPR2024-00614

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04W72/14	/	72	/	14

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473 (Primary Examiner)	14 December 2020 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3B

U.S. Patent and Trademark Office — Part of Paper No.: 20201214

ASUS EX2019-p.478
Samsung v. ASUS
IPR2024-00614

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/099,421	WU, Chunli
	Examiner	**Art Unit**
	HARDIKKUMAR D PATEL	2473

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

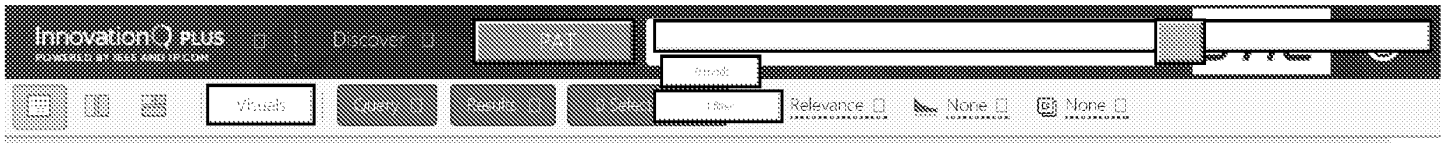
CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
-	1	-	10	-	19	-	28	6	37	13	46				
-	2	-	11	-	20	1	29	7	38	14	47				
-	3	-	12	-	21	-	30	-	39	15	48				
-	4	-	13	-	22	2	31	8	40	16	49				
-	5	-	14	-	23	3	32	-	41	17	50				
-	6	-	15	-	24	-	33	9	42	18	51				
-	7	-	16	-	25	4	34	10	43	19	52				
-	8	-	17	-	26	5	35	11	44	20	53				
-	9	-	18	-	27	-	36	12	45						

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	14 December 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3B

U.S. Patent and Trademark Office Part of Paper No.: 20201214

ASUS EX2019-p.479
Samsung v. ASUS
IPR2024-00614



1 - 50 2,012,594 results

1.

Method for receiving downlink control information and method for transmitting same, user equipment and base station

The present invention relates to a wireless communication system. More particularly, the present invention, when cells each operating in different TDD DL-UL configurations are merged, provides a plan for setting a UL grant transmission/reception timing for a cross-CC scheduling. In addition, the...

CURRENT ASSIGNEES: LG ELTNC INC
WO2012124942A2 | WIPO APPLICATIONS | 20-SEP-2012

2.

Method for receiving downlink control information and method for transmitting same, user equipment and base station

The present invention relates to a wireless communication system. In detail, the present invention provides a method for setting UL grant transmission / reception timing for cross-CC scheduling when cells operating in different TDD DL-UL configurations are merged. The present invention also provides ...

CURRENT ASSIGNEES: LG ELTNC INC
KR20140045384A | KOREA APPLICATIONS | 16-APR-2014

3.

Method for transmitting/Receiving data in wireless communication system and base station for same

In the present invention, a method for transmitting/receiving data in a wireless communication system supporting carrier aggregation/multiple cells and a base station for same are disclosed. More particularly, the method comprises: receiving from the e Node B through a physical downlink control...

CURRENT ASSIGNEES: LG ELTNC INC
US20140050130 | US APPLICATIONS | 20-FEB-2014

4.

Method for transmitting/receiving data in wireless communication system and base station for same

In the present invention, a method for transmitting/receiving data in a wireless communication system supporting carrier aggregation/multiple cells and a base station for same are disclosed. More particularly, the method comprises: receiving from the e Node B through a physical downlink control...

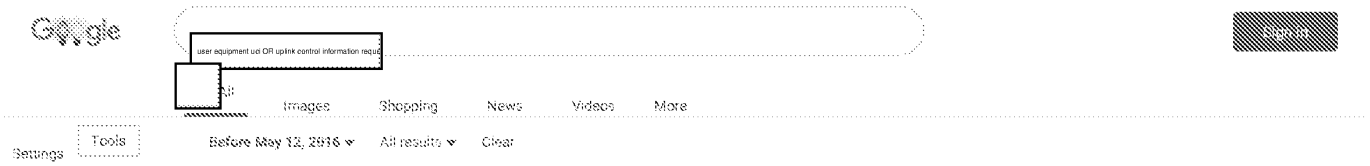
CURRENT ASSIGNEES: LG ELTNC INC
US9225503 | US PATENTS | 29-DEC-2015

5.

Method for receiving ack(Acknowledgement)/Nack (Negative ack) information and method for transmitting same, user equipment and base station

The present invention relates to a wireless communication system. More particularly, the present invention, when cells each operating in different TDD DL-UL configurations...

Result #1



www.arib.or.jp › overview › doc › 5_Appendix › Rel10 PDF

3GPP TS 36.213

Dec 27, 2010 -- UE procedure for determining physical uplink control channel assignment . ... User Equipment. UL ... for control data sent via PUSCH without UL-SCH data and 1 for other cases ... for a subframe where no PDCCH with DCI format 0/4 is decoded for .. is 0 dB for all PDSCH transmission schemes except multi-user MIMO and ...

www.ijert.org › uci-transmission-via-pucch-in-lte-uplink

UCI Transmission via PUCCH in LTE Uplink -- IJERT

Jun 17, 2014 -- Skip to content ... The PRACH is used only for initializing and registering user equipment (UE) to the ... PUSCH and PUCCH are never transmitted in the same sub frame. UCI is transmitted via PUCCH in the case where UE has no traffic data to ... Other control information in uplink is a Hybrid Automatic Repeat Request ..

www.rohde-schwarz.com › file PDF

LTE-Advanced Release 12 Technology Introduction - Rohde ...

Feb 28, 2015 -- Independently from the supported UE category, the user device .. subframe set1, and value csi-SubframeSet2 means the alternative CQI table applies to ... transmission – switching between MeNB and SeNB for uplink data requires layer 3 ... according to a priority order based on Uplink Control Information (UCI) type.
by JG Roessler - Cited by 29 - Related articles

www.diva-portal.org › diva2:828296 › FULLTEXT01 PDF

Impact of DRX on VoIP Performance and Battery Life in ... - DiVA

Nov 16, 2004 -- Abstract. Along with higher data rates and application-enriched user terminals, ... and battery power particularly in the case when no uplink (UL) or downlink (DL) ...
by WA Khan - 2009 - Cited by 14 - Related articles

www.sciencedirect.com › topics › engineering › s1-interfa...

S1 Interface - an overview | ScienceDirect Topics

Mar 15, 2011 -- The protocol stack for the control plane between the UE and MME is shown in ... GTP-U is used for carrying user data within EPC and the GPRS core network, and ... The basic transmission scheme in the uplink is the single-carrier transmission .. As mentioned earlier, the information fields in the downlink scheduling grant ...

www.etsi.org › deliver › etsi_ts [pdf]

LTE - ETSI

Apr 15, 2011 -- **Transmission** Time Interval. **UCI**. **Uplink Control Information**. UE. **User Equipment**. UL. **Uplink**. UL-SCH. **Uplink** Shared Channel. VRB. Virtual Resource Block. 4.

www.sharetechnote.com › html › Handbook_LTE_SR

SR (Scheduling Request) - ShareTechnote

Dec 30, 2015 -- Putting it other way, SR is an **Uplink** Physical Layer message from UE to Network, ... Would you send me some **Grant** (DCI 0) for me to send the **data** ?". ... Many of eNB or test **equipment** would let you convert its log into wireshark file, but it is ... The timing and physical **control** channel configuration for SR **transmission** can be ...
Missing: **user information no skip**

www.google.com › patents

US20110300849A1 - ACK/NACK Detection in LTE PUSCH ...

Dec 8, 2011 -- in the **uplink transmission** between the **user equipment** and the base station (typically ... is included in the physical **control** channel, called Physical Downlink **Control** ... blocks, LTE has adopted the Hybrid Automatic Repeat **Request** (HARQ) scheme. ... The ACK/NACK **information** will be encoded and punctured into the **data** ...

data.epo.org › publication-dates › patents › document

Deterministic UE behaviour for CSI/SRS Reporting during DRX

Sep 24, 2014 -- LTE is designed to meet the carrier needs for high speed **data** and media ... **information** broadcast, ciphering/deciphering of user and **control** plane **data**, ... 10 **user equipment** with reception and/or **transmission** capabilities for carrier ... **request** bit in an **uplink** resource **grant** sent on the Physical Downlink **Control** Channel.

www.google.com.gi › patents

(ca), pucch, and quasi-contiguous uplink resource ... - Google

Nov 20, 2014 -- **Transmission** of **data** comprise at least two **data** clusters of sub carriers ... UTRAN allows for connectivity between the **user equipment** (UE) and the core ... Physical **Uplink Control** Channel (PUCCH) is used to transmit **control information**, such ... same **subframe** with the CA UE transmitting the contiguous PUSCH allocation.

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	2472	((("NOKIA") near3 ("TECHNOLOGIES") near3 ("OY"))).AS,AANM.	USPAT	OR	ON	ON	2019/09/27 07:53 AM
L2	119	((("WU") near3 ("Chunli"))).INV.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	ON	2019/09/27 07:53 AM
L3	0	"2018142220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 08:28 AM
L4	0	"20181042220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 08:28 AM
L5	2	"20110310833"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 08:28 AM
L6	14040	(ue mobile terminal (user near3 equipment)) with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:06 AM
L7	2414	(ue mobile terminal (user near3 equipment)) with request$3 with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:07 AM
L8	1534	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:10 AM
L9	1047	L8 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:10 AM
L10	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:12 AM
L11	521	L10 and	US-PGPUB; USPAT;	OR	ON	ON	2019/09/27

ASUS EX2019-p.484
Samsung v. ASUS
IPR2024-00614

		@ad<="20160512"	USOCR; EPO; IBM_TDB				10:15 AM
L12	271	L10 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:15 AM
L13	194	L11 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 10:15 AM
L14	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 11:37 AM
L15	733	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station) and L14	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2019/09/27 11:37 AM
L16	366	(H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02).cpc. and L15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2019/09/27 11:39 AM
L17	131	(skip$3) near5 (uplink reserve$1 near3 link) same grant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/04/13 12:39 PM
L18	31	L17 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/04/13 12:42 PM
L19	19	L18 and (uci (uplink near6 control near4 (information transmi$5)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/04/13 01:37 PM
L20	11504	(uci ((ul uplink) near6 control near4 (information transmi$5))) same (uplink ul) near5 (grant)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/08/28 12:37 PM
L21	285	(wtru or Bluetooth or pds or laptop or mn or mt or ms or ue or wtru or ipad or iphone or (mobile near2 (node or device terminal or station or subscrib$4)) or (user	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/08/28 12:42 PM

ASUS EX2019-p.485
Samsung v. ASUS
IPR2024-00614

		near2 (device equip$5) subscriber user unit)) near7 (request$3 permision permission feedback) near7 (uci ((ul uplink) near6 control near4 (information transmi$5))) same (uplink ul) near5 (grant)					
L22	164	L21 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 01:15 PM
L23	11	L22 and skip$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 01:20 PM
L24	135	(skip$4 jump$3) near6 ((ul uplink) near5 transmission) with ((ul uplink) near4 grant$1)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/08/28 02:37 PM
L25	166	(skip$4 jump$3) near6 ((ul uplink) near5 transmission) with ((ul uplink) near4 grant$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 02:37 PM
L26	39	L25 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 02:37 PM
L27	14	L26 and uci	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 02:38 PM
L28	69	(skip$4 jump$3) near6 ((ul uplink)) with ((ul uplink) near4 grant$1) with ("no" near4 (ul uplink) near5 (data information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 02:54 PM
L29	5	L28 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/08/28 02:54 PM
L30	2978	((("NOKIA") near3 ("TECHNOLOGIES") near3 ("OY"))).AS,AANM.	USPAT	OR	ON	ON	2020/12/15 11:58 AM
L31	148	((("WU") near3	US-PGPUB; USPAT;	OR	ON	ON	2020/12/15

ASUS EX2019-p.486
Samsung v. ASUS
IPR2024-00614

		("Chunli"))).INV.	USOCR; EPO; JPO; DERWENT				11:58 AM
L32	0	"2018142220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L33	0	"20181042220"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L34	2	"20110310833"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L35	18570	(ue mobile terminal (user near3 equipment)) with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L36	3383	(ue mobile terminal (user near3 equipment)) with request$3 with (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L37	2058	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L38	1006	L8 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L39	874	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L40	475	L10 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L41	304	L10 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L42	171	L11 and uplink near4 grant	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L43	874	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM

ASUS EX2019-p.487
Samsung v. ASUS
IPR2024-00614

		near3 (information indication))) same (enb base near3 station)					
L44	874	(ue mobile terminal (user near3 equipment)) with request$3 near9 (UCI (uplink near3 control near3 (information indication))) same (enb base near3 station) and L14	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L45	489	(H04W72/14 H04L1/0061 H04L1/1812 H04W28/0278 H04W72/0413 H04W72/0446 H04W80/02).cpc. and L15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L46	165	(skip$3) near5 (uplink reserve$1 near3 link) same grant	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L47	27	L17 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L48	19	L18 and (uci (uplink near6 control near4 (information transmi$5)))	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L49	11947	(uci ((ul uplink) near6 control near4 (information transmi$5))) same (uplink ul) near5 (grant)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L50	273	(wtru or Bluetooth or pds or laptop or mn or mt or ms or ue or wtru or ipad or iphone or (mobile near2 (node or device terminal or station or subscrib$4)) or (user near2 (device equip$5) subscriber user unit)) near7 (request$3 permision permission feedback) near7 (uci ((ul uplink) near6 control near4 (information transmi$5))) same (uplink ul) near5 (grant)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L51	164	L21 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO;	OR	ON	ON	2020/12/15 11:58 AM

			JPO; DERWENT; IBM_TDB				
L52	9	L22 and skip$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L53	150	(skip$4 jump$3) near6 ((ul uplink) near5 transmission) with ((ul uplink) near4 grant$1)	US-PGPUB; USPAT; USOCR; EPO; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L54	185	(skip$4 jump$3) near6 ((ul uplink) near5 transmission) with ((ul uplink) near4 grant$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L55	37	L25 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L56	14	L26 and uci	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L57	2	(skip$4 jump$3) near6 ((ul uplink)) with ((ul uplink) near4 grant$1) with ("no" near4 (ul uplink) near5 (data information))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L58	0	L28 and @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 11:58 AM
L59	28	(H04W72/14 H04L1/0061 H04L1/1664 H04L1/1671 H04L1/1812 H04L1/1854 H04L5/0044 H04L5/0053 H04L5/0064 H04W28/0278 H04W72/0413 H04W72/0446 H04W72/1284 H04W80/02 H04W72/12 H04W56/00 H04W74/08 H04L1/0025 H04W74/0833 H04L5/0007 H04L27/3836;H04W28/06 H04W72/1289 H04W72/04	US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 05:24 PM

ASUS EX2019-p.489
Samsung v. ASUS
IPR2024-00614

		H04W52/0209 H04L1/1829 H04W72/1268 H04L1/1861 H04W74/008 Y02D70/00 Y02D70/1262 Y02D30/70 H04W76/28 H04L5/0055 H04L5/0053 H04W72/1289 H04L1/0027 H04L2001/125 H04L5/00 H04L1/003 H04L1/0059 H04L1/0073 H04L1/1893 H04W72/02; H04L1/0057 H04L1/1671 H04W52/0216 H04L1/0026 H04L1/0061 H04W72/0413 H04L2001/125 H04L1/00 H04W72/1284 H04W52/02 H04L1/0009 H04W52/365 H04L1/0003 H04W72/1294 H04W72/042 H04W72/0406).cpc. AND ((wtru OR Bluetooth OR pds OR laptop OR mn OR mt OR ms OR ue OR wtru OR ipad OR iphone OR (mobile near2 (node OR device terminal OR station OR subscrib$4)) OR (user near2 (device equip$5) subscriber user unit)) SAME (uci (uplink near3 control near3 (information data))) SAME (subframe sub?frame frame packet pdu sdu) SAME (empty mute blank) near4 (uplink near5 (data information packet frame pdu sdu)))					
L60	6	L59 AND @ad<="20160512"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 05:24 PM
L61	6	L59 AND @ad<=20160512	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 05:25 PM
L63	40	(H04W72/14 H04L1/0061 H04L1/1664 H04L1/1671 H04L1/1812 H04L1/1854 H04L5/0044 H04L5/0053	US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 05:32 PM

ASUS EX2019-p.490
Samsung v. ASUS
IPR2024-00614

		H04L5/0064 H04W28/0278 H04W72/0413 H04W72/0446 H04W72/1284 H04W80/02 H04W72/12 H04W56/00 H04W74/08 H04L1/0025 H04W74/0833 H04L5/0007 H04L27/3836;H04W28/06 H04W72/1289 H04W72/04 H04W52/0209 H04L1/1829 H04W72/1268 H04L1/1861 H04W74/008 Y02D70/00 Y02D70/1262 Y02D30/70 H04W76/28 H04L5/0055 H04L5/0053 H04W72/1289 H04L1/0027 H04L2001/125 H04L5/00 H04L1/003 H04L1/0059 H04L1/0073 H04L1/1893 H04W72/02; H04L1/0057 H04L1/1671 H04W52/0216 H04L1/0026 H04L1/0061 H04W72/0413 H04L2001/125 H04L1/00 H04W72/1284 H04W52/02 H04L1/0009 H04W52/365 H04L1/0003 H04W72/1294 H04W72/042 H04W72/0406).cpc. AND (generat$3 creat$3 establish$3 initiate process$3) near5 (transport near3 (slot block)) SAME (uci (uplink near3 control near3 information)) SAME (grant$3 allow$3 permission$3) SAME (pusch (physical near3 uplink near3 shar$3 near3 channel))				
L65	11	L63 AND @ad<=20160512	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	ON	2020/12/15 05:34 PM

ASUS EX2019-p.491
Samsung v. ASUS
IPR2024-00614

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	1	(generat$3 creat$3 establish$3 initiate process$3) near5 (transport near3 (slot block)) SAME (uci (uplink near3 control near3 information)) SAME (grant$3 allow$3 permission$3) SAME (pusch (physical near3 uplink near3 shar$3 near3 channel)).clm.	US-PGPUB; USPAT	OR	ON	ON	2020/12/15 05:42 PM
N2	0	((wtru OR Bluetooth OR pds OR laptop OR mn OR mt OR ms OR ue OR wtru OR ipad OR iphone OR (mobile near2 (node OR device terminal OR station OR subscrib$4)) OR (user near2 (device equip$5) subscriber user unit)) SAME (uci (uplink near3 control near3 (information data))) SAME (subframe sub?frame frame packet pdu sdu) SAME (empty mute blank) near4 (uplink near5 (data information packet frame pdu sdu))).clm.	US-PGPUB; USPAT	OR	ON	ON	2020/12/15 05:42 PM
N3	0	(skip$4 jump$3) near6 ((ul uplink)) WITH ((ul uplink) near4 grant$1) WITH ("no" near4 (ul uplink) near5 (data information)).clm.	US-PGPUB; USPAT	OR	ON	ON	2020/12/15 05:43 PM

ASUS EX2019-p.492
Samsung v. ASUS
IPR2024-00614

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)

10948 7590 12/23/2020
Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

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.

Elaine F. Mian	(Typed or printed name)
Elaine F. Mian	(Signature)
2/19/2021	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

TITLE OF INVENTION: METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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	03/23/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, HARDIKKUMAR D	2473	370-329000

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 Harrington & Smith
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: Nokia Technologies Oy

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Espoo, Finland

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. 50-1924

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 John F. Gulbin Date February 19, 2021

Typed or printed name John F. Gulbin Registration No. 33,180

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

ASUS EX2019-p.493
Samsung v. ASUS
IPR2024-00614

PTO/SB/47 (09-06)
Approved for use through 04/30/2009. OMB 0651-0016
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.

"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop M Correspondence
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

- OR -

Fax to:
571-273-6500

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. **When to check the first box below**: If you have a Customer Number to represent the fee address. **When to check the second box below**: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

☑ Customer Number: 00197

OR

☐ The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (If known)	APPLICATION NUMBER
	16/099,421

Completed by (check one):

☐ Applicant/Inventor

☑ Attorney or Agent of record 33,180 (Reg. No.)

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☐ Assignee recorded at Reel _____ Frame_____

John F. Gulbin — Signature

John F. Gulbin — Typed or printed name

203-925-9400 — Requester's telephone number

February 19, 2021 — Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more that one signature is required, see below*.

☐ * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.363. The information is required to obtain or retain a benefit by the public which is to 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 5 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 COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop M Correspondence, 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.

Electronic Patent Application Fee Transmittal

Application Number:	16099421
Filing Date:	06-Nov-2018
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Filer:	Mark F. Harrington/Elaine Mian
Attorney Docket Number:	800.2735.U1(US)

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

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

Electronic Acknowledgement Receipt

EFS ID:	41967581
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Elaine Mian
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	19-FEB-2021
Filing Date:	06-NOV-2018
Time Stamp:	12:38:59
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1200
RAM confirmation Number	E20212IC39140351
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)	IssueFeeTransmittal.pdf	78564 0d08d99686e2bbd226149173547b06d927b51c42	no	1
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	FeeAddressIndication.pdf	57088 8bf7284410be60ebf72befb636f1c58f806d7036	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30783 49c4ed4e9696b31394fd51355f6f53b8a257e3c4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	166435		

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.

Electronic Acknowledgement Receipt

EFS ID:	41966022
Application Number:	16099421
International Application Number:	
Confirmation Number:	8013
Title of Invention:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION
First Named Inventor/Applicant Name:	Chunli WU
Customer Number:	10948
Filer:	Mark F. Harrington/Elaine Mian
Filer Authorized By:	Mark F. Harrington
Attorney Docket Number:	800.2735.U1(US)
Receipt Date:	19-FEB-2021
Filing Date:	06-NOV-2018
Time Stamp:	11:16:14
Application Type:	U.S. National Stage under 35 USC 371

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	Amendment after Notice of Allowance (Rule 312)	AmendmentAfterAllowance.pdf	172351 e074f1c0511c3db401fa3a19392096d80f2ab412	no	7
Warnings:					

Information:	
Total Files Size (in bytes):	172351

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 U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1(US)
CONFIRMATION NO.:	8013
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

AMENDMENT AFTER ALLOWANCE

SIR:

Please amend the application as shown below.

AMENDMENTS TO THE CLAIMS:

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

Listing of Claims:

1. to 28. (Canceled)

29. (Currently amended) A method comprising:

receiving, by a user equipment, a configuration message from a network node, wherein the configuration message indicates to the user equipment to skip uplink transmission for an uplink grant when there is no uplink data;

determining whether the user equipment is requested for uplink control information transmission for a subframe with the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator;

when it is determined that the user equipment is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block even when there is no uplink data to be transmitted; and

transmitting the generated transport block and the uplink control information to the network node in the uplink grant on ~~the~~ a physical uplink shared channel.

30. (Canceled)

31. (Currently amended) The method according to claim 29, wherein, when it is determined that the user equipment is not requested for the uplink control information transmission for the subframe with the uplink grant and ~~the~~ a protocol data unit is a padding buffer status report only protocol data unit, skipping generating a transport block.

ASUS EX2019-p.502
Samsung v. ASUS
IPR2024-00614

32. (Currently amended) The method according to claim 29, wherein the uplink control information further comprises at least one of: a periodic channel quality indicator and a hybrid automatic repeat request feedback.

33. (Canceled)

34. (Previously presented) The method according to claim 29, further comprising receiving the uplink grant from the network node.

35. (Currently amended) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

receive a configuration message from a network node, wherein the configuration message indicates to the apparatus to skip uplink transmission for an uplink grant when there is no uplink data;

determine whether the apparatus is requested for uplink control information transmission for a subframe with the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator;

when it is determined that the ~~user equipment~~ apparatus is requested for the uplink control information transmission for the subframe with the uplink grant, generating a transport block even when there is no uplink data to be transmitted; and

transmitting the generated transport block and the uplink control information to the network node in the uplink grant on a physical uplink shared channel.

36. (Canceled)

ASUS EX2019-p.503
Samsung v. ASUS
IPR2024-00614

37. (Currently amended) The apparatus according to claim 35, wherein, when it is determined that the ~~user equipment~~ apparatus is not requested for the uplink control information transmission for the subframe with the uplink grant and ~~the~~ a protocol data unit is a padding buffer status report only protocol data unit, the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to skip generating a transport block.

38. (Currently amended) The apparatus according to claim 35, wherein the uplink control information further comprises at least one of: a periodic channel quality indicator and a hybrid automatic repeat request feedback.

39. (Canceled)

40. (Previously presented) The apparatus according to claim 35, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to receive the uplink grant from the network node.

41. (Canceled)

42. (Previously presented) The apparatus according to claim 35, wherein the apparatus comprises a user equipment.

43. (Previously presented) A method comprising:

transmitting, by a network node, a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receiving, from the at least one user equipment, a transport block comprising uplink control information in the uplink grant even when there is no uplink data to be transmitted in the

ASUS EX2019-p.504
Samsung v. ASUS
IPR2024-00614

uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator.

44. (Currently amended) The method according to claim 43, wherein the uplink control information further comprises at least one of: a periodic channel quality indicator and a hybrid automatic repeat request feedback.

45. (Currently amended) The method according to claim 43, further comprising transmitting the uplink grant to the at least one user equipment.

46. (Previously presented) An apparatus comprising:

at least one processor; and

at least one memory including computer program code, the at least one memory and the computer program code being configured, with the at least one processor, to cause the apparatus at least to:

transmit a configuration message for configuring at least one user equipment to skip uplink transmission for an uplink grant when there is no uplink data; and

receive, from the at least one user equipment, a transport block comprising uplink control information in the uplink grant even when there is no uplink data to be transmitted in the uplink grant, wherein the uplink control information comprises an aperiodic channel quality indicator.

47. (Currently amended) The apparatus according to claim 46, wherein the uplink control information further comprises at least one of: a periodic channel quality indicator and a hybrid automatic repeat request feedback.

48. (Currently amended) The apparatus according to claim 46, wherein the at least one memory and the computer program code are further configured, with the at least one processor, to cause the apparatus at least to transmit the uplink grant to the at least one user equipment.

ASUS EX2019-p.505
Samsung v. ASUS
IPR2024-00614

49. (Previously presented) The apparatus according to claim 35, wherein the generated transport block comprises padded zeros multiplexed with the uplink control information.

50. (Previously presented) The apparatus according to claim 46, wherein the transport block comprises padded zeros multiplexed with the uplink control information.

51. (Currently amended) The apparatus according to claim 35, wherein the type of the ~~UL~~ uplink grant is a dynamic uplink grant.

52. (Previously presented) The apparatus according to claim 35, wherein uplink data refers to uplink data from a medium access control layer.

53. (Currently amended) The apparatus according to claim 35, wherein determining whether the apparatus is requested for uplink control information transmission for the uplink grant is based on receiving a request for the ~~uplink~~ aperiodic channel quality indicator.

ASUS EX2019-p.506
Samsung v. ASUS
IPR2024-00614

REMARKS

Entry of the preceding amendment is respectfully requested. It is being submitted for the sake of clarity and to correct several antecedent basis issues.

Respectfully submitted,

John F. Gulbin — February 19, 2021

John F. Gulbin
Registration No. 33,180

Date

Customer No.: 10948

HARRINGTON & SMITH, ATTORNEYS AT LAW, LLC
4 Research Drive
Shelton, CT 06484-6212

Telephone: (203) 925-9400 ext. 15
Facsimile: (203) 944-0245
E-mail: jgulbin@hspatent.com

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or is being transmitted electronically to the United States Patent and Trademark Office.

Elaine F. Mian — 2/19/2021

Name of Person Making Deposit

Date

ASUS EX2019-p.507
Samsung v. ASUS
IPR2024-00614

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.
16/099,421	11/06/2018	Chunli WU	800.2735.U1(US)	8013

10948 7590 03/09/2021

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

EXAMINER
PATEL, HARDIKKUMAR D

ART UNIT	PAPER NUMBER
2473	

NOTIFICATION DATE	DELIVERY MODE
03/09/2021	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):

USPTO@hspatent.com

ASUS EX2019-p.508
Samsung v. ASUS
IPR2024-00614

Response to Rule 312 Communication	Application No.	Applicant(s)	
	16/099,421	WU, Chunli	
	Examiner	Art Unit	AIA (FITF) Status
	HARDIKKUMAR D PATEL	2473	Yes

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

1. ☑ The amendment filed on 19 February 2021 under 37 CFR 1.312 has been considered, and has been:

a) ☐ entered.

b) ☑ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/HARDIKKUMAR D PATEL/ Examiner, Art Unit 2473	

ASUS EX2019-p.509
Samsung v. ASUS
IPR2024-00614

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE U.S. PATENT APPLICATION OF:

INVENTOR(S):	Chunli WU
SERIAL NO.:	16/099,421
FILING DATE:	November 6, 2018
EXAMINER:	Hardikkumar D. PATEL
ART UNIT:	2473
ATT'Y DOCKET NO.:	800.2735.U1(US)
CONFIRMATION NO.:	8013
TITLE:	METHODS AND APPARATUSES FOR SKIPPING TRANSPORT BLOCK TRANSMISSION DEPENDING ON UPLINK CONTROL INFORMATION TRANSMISSION

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

AMENDMENT AFTER ALLOWANCE

SIR:

Please amend the application as shown below.

OK TO ENTER: /H.D.P/

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.
16/099,421	04/13/2021	10980056	800.2735.U1(US)	8013

10948 7590 03/24/2021

Harrington & Smith, Attorneys At Law, LLC
4 Research Drive, Suite 202
Shelton, CT 06484

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):

Chunli WU, Beijing, CHINA;
Nokia Technologies Oy, Espoo, FINLAND;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.