PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)* **10 January 2019 (10.01.2019)**

Applicant's or agent's file reference
FE18171WO

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/KR2018/011588	**28 September 2018 (28.09.2018)**	28 September 2017 (28.09.2017)

International Patent Classification (IPC) or both national classification and IPC
H04W 72/04(2009.01)i, H04W 72/12(2009.01)i, H04L 5/00(2006.01)i

Applicant
INTEL IP CORPORATION et al.

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

- ☒ 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
- ☒ 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
- ☐ Box No. VII Certain defects in the international application
- ☐ 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 66.1bis(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/KR	Date of completion of this opinion	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea Facsimile No. +82-42-481-8578	10 January 2019 (10.01.2019)	KANG, Hee Gok Telephone No. +82-42-481-8264

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/KR2018/011588

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:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/KR2018/011588

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

1. Statement

Novelty (N)	Claims	1-23	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-23	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:
D1: RAN WG1, 'LS on Bandwidth Part Operation in NR', R1-1711998, 3GPP TSG-RAN WG1 NR Ad-Hoc#2, Qingdao, P.R. China, 12 August 2017
D2: HUAWEI et al., 'Details on multiple SR configurations', R2-1708265, 3GPP TSG-RAN2 Meeting #99, Berlin, Germany, 11 August 2017
D3: ZTE, 'Consideration on the SR in NR', R2-1708146, 3GPP TSG-RAN WG2 #99, Berlin, Germany, 11 August 2017
D4: HUAWEI et al., 'Scheduling and resource allocation mechanism for active bandwidth parts', R1-1709974, 3GPP TSG-RAN WG1 NR Ad Hoc Meeting, Qingdao, China, 17 June 2017
D5: WO 2017-136995 A1 (JRD COMMUNICATION INC.) 17 August 2017

2.1 Novelty and Inventive Step
2.1.1 Claims 1-13
D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses that multiple bandwidth part (BWP) configurations for each component carrier can be signalled to a UE, wherein separate sets of the BWP configurations for DL & UL are provided per component carrier for FDD, wherein the bandwidth part configuration (if multiple) should be assumed for resource allocation at a given time indicated to the UE in the multiple bandwidth part (BWP) configurations; and activation/deactivation of DL and UL bandwidth parts can be by means of dedicated RRC signaling (by means of DCI, by means of timer or according to configured time pattern) (see pages 1-3).
Claim 1 differs from D1 in processing circuitry configured to: decode an RRC message to obtain mapping information; identify one or more SR configurations which an LCH is mapped to based on the mapping information; and encode an SR on a PUCCH based on a SR configuration.
However, the difference comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (a logical channel can be mapped to none or one SR configuration, wherein the logical channel can be mapped to more than one SR configuration and the mapping should be configured by RRC signalling; and the SR configuration includes sr-PUCCH-ResourceIndex which indicates the PUCCH resources for SR transmission: see pages 1-2).

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Supplemental Box

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Accordingly, claim 1 would have been obvious over the combination of D1 and D2. Therefore, claim 1 lacks an inventive step under PCT Article 33(3).

The additional features of claims 2-3 come within the scope of the customary practice followed by a person skilled in the art considering the feature of D1 (activation/deactivation of DL and UL bandwidth parts can be by means of DCI: see page 3).

The additional features of claims 4-6 come within the scope of the customary practice followed by a person skilled in the art considering the feature of D1 (activation/deactivation of DL and UL bandwidth parts can be by means of timer: see page 3).

The additional features of claims 7-8 and 13 come within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (a logical channel can be mapped to none or one SR configuration, wherein the logical channel can be mapped to more than one SR configuration and the mapping should be configured by RRC signalling; and the SR configuration includes sr-PUCCH-ResourceIndex which indicates the PUCCH resources for SR transmission: see pages 1-2).

The additional features of claims 9-10 come within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (multiple sr-ProhibitTimer can be configured to the UE and sr-ProhibitTimer is used depending on which SR configuration is used; and sr-ProhibitTimer is configured per SR configuration: see page 3).

The additional feature of claim 11 comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D3 (the BSR (Buffer Status Report) formats are identified by MAC PDU subheaders with LCIDs: see page 2).

The additional feature of claim 12 comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (the motivation to introduce multiple SR configurations is to distinguish numerology/TTI length, and based on this motivation, it is reasonable that some LCHs mapped to the same numerology/TTI length can further be associated with the same SR configurations: see page 1).

Therefore, claims 2-10 and 12-13 lack an inventive step under PCT Article 33(3) as being obvious over the combination of D1 and D2, and claim 11 lacks an inventive step under PCT Article 33(3) as being obvious over the combination of D1, D2 and D3.

2.1.2 Claims 14-23
D1, which is considered to be the closest prior art to the subject matter of claim 14, discloses that multiple bandwidth part (BWP) configurations for each component carrier can be signalled to a UE; separate sets of the BWP configurations for DL & UL are configured per component

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carrier for FDD, wherein the bandwidth part configuration (if multiple) should be assumed for resource allocation at a given time indicated to the UE in the multiple bandwidth part (BWP) configurations; and activation/deactivation of DL and UL bandwidth parts can be by means of dedicated RRC signaling (by means of DCI, by means of timer, or according to configured time pattern) (see pages 1-3).
Claim 14 differs from D1 in processing circuitry configured to: encode mapping information indicative of a correlation between an LCH and one or more SR configurations; and decode a PUCCH to obtain an SR, the PUCCH being associated with a SR configuration.
However, the difference comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (a logical channel can be mapped to none or one SR configuration, wherein the logical channel can be mapped to more than one SR configuration and the mapping should be configured by RRC signalling; and the SR configuration includes sr-PUCCH-ResourceIndex which indicates the PUCCH resources for SR transmission: see pages 1-2).
Accordingly, claim 14 would have been obvious over the combination of D1 and D2. Therefore, claim 14 lacks an inventive step under PCT Article 33(3).

The additional features of claims 15-16 come within the scope of the customary practice followed by a person skilled in the art considering the feature of D1 (activation/deactivation of DL and UL bandwidth parts can be by means of DCI: see page 3).

The additional feature of claim 17 comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D1 (activation/deactivation of DL and UL bandwidth parts can be by means of timer: see page 3).

The additional features of claims 18-19 and 23 come within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (a logical channel can be mapped to none or one SR configuration, wherein the logical channel can be mapped to more than one SR configuration and the mapping should be configured by RRC signalling; and the SR configuration includes sr-PUCCH-ResourceIndex which indicates the PUCCH resources for SR transmission: see pages 1-2).

The additional feature of claim 20 comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (multiple sr-ProhibitTimer can be configured to the UE and sr-ProhibitTimer is used depending on which SR configuration is used; and sr-ProhibitTimer is configured per SR configuration: see page 3).

The additional feature of claim 21 comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D3 (the BSR (Buffer Status Report) formats are identified by MAC PDU subheaders with LCIDs: see page 2).

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The additional feature of claim 22 comes within the scope of the customary practice followed by a person skilled in the art considering the feature of D2 (the motivation to introduce multiple SR configurations is to distinguish numerology/TTI length, and based on this motivation, it is reasonable that some LCHs mapped to the same numerology/TTI length can further be associated with the same SR configurations: see page 1).

Therefore, claims 15-20 and 22-23 lack an inventive step under PCT Article 33(3) as being obvious over the combination of D1 and D2, and claim 21 lacks an inventive step under PCT Article 33(3) as being obvious over the combination of D1, D2 and D3.

2.2 Industrial Applicability
Claims 1-23 meet the requirements of industrial applicability under PCT Article 33(4).