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16/739,975 10 January 2020 (10.01.2020) US(71) Applicant: **QUALCOMM INCORPORATED** [US/US];
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11583, Salt Lake City, Utah 84147 (US).(81) Designated States (*unless otherwise indicated, for every
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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,
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KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
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OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
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TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
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(54) Title: RESOURCE RESERVATION TECHNIQUES FOR WIRELESS COMMUNICATIONS

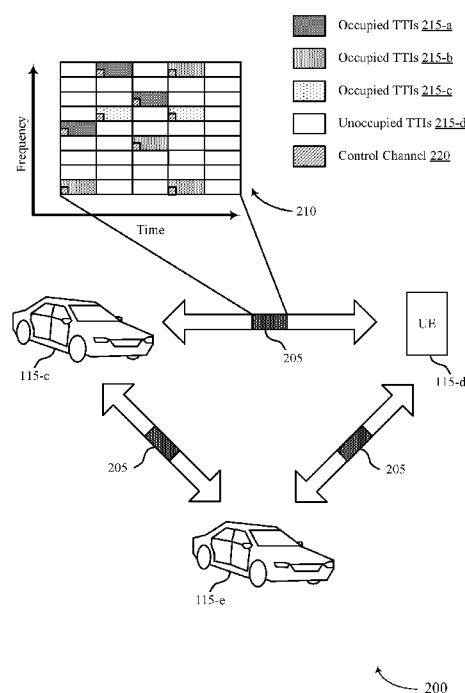


FIG. 2

(57) Abstract: Methods, systems, and devices for wireless communications are described in which a transmitting user equipment (UE) may determine a data packet to transmit to another UE and determine a set of candidate resources for transmission of the data packet based on a set of time-frequency resources that are allocated for UE-to-UE communications. A resource reservation signal (RRS) may be transmitted to indicate to other UEs that the set of candidate resources have been reserved by a UE. The RRS may be transmitted such that the RRS may be differentiated from other regular transmissions based at least in part on information provided by a control channel associated with the RRS or a payload of a transmission that includes the RRS. The RRS may indicate one or more of a size of an allocation of the resources and multiple locations of the resources within a time-frequency resource pool.

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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2020/013245

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2020/013245

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04W72/04
ADD.

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)
H04W

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2018/030541 A1 (NTT DOCOMO INC) 15 February 2018 (2018-02-15)	1,30
Y	abstract	14-17, 21,22,25
	-& EP 3 499 921 A1 (NTT DOCOMO INC [JP]) 19 June 2019 (2019-06-19) paragraph [0019] paragraph [0034] - paragraph [0035] paragraph [0046]	
Y	----- WO 2018/175553 A1 (INTEL CORP [US]; INTEL IP CORP [US]) 27 September 2018 (2018-09-27)	25
A	paragraph [00124] paragraph [00127] paragraph [00131] paragraph [0176] ----- -/-	1-13, 26-30



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

6 July 2020

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14/07/2020

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2020/013245

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	NTT DOCOMO ET AL: "Transmitter UE behaviour for sensing-based resource allocation", 3GPP DRAFT; R1-165192 RESERVATION AND SENSING SIDELINK, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE , vol. RAN WG1, no. Nanjing, China; 20160523 - 20160527 14 May 2016 (2016-05-14), XP051096221, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_85/Docs/ [retrieved on 2016-05-14]	14-17, 21,22
A	paragraph [0003] -----	18-20, 23,24

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2020/013245

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2018030541 A1	15-02-2018	CN 109792590 A EP 3499921 A1 JP 6357509 B2 JP 2018026736 A US 2019208504 A1 WO 2018030541 A1	21-05-2019 19-06-2019 11-07-2018 15-02-2018 04-07-2019 15-02-2018
EP 3499921 A1	19-06-2019	CN 109792590 A EP 3499921 A1 JP 6357509 B2 JP 2018026736 A US 2019208504 A1 WO 2018030541 A1	21-05-2019 19-06-2019 11-07-2018 15-02-2018 04-07-2019 15-02-2018
WO 2018175553 A1	27-09-2018	CN 110447294 A EP 3603293 A1 US 2019394786 A1 WO 2018175553 A1	12-11-2019 05-02-2020 26-12-2019 27-09-2018

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13, 30

Method and apparatus for avoiding interference

2. claims: 14-24

Method for signalling sidelink resources

3. claims: 25-29

Method for allocating resources
