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kind of national protection available): AE, AG, AL, AM,
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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
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KR, KZ, LA, LC, LK, LR, LS, LT, 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, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ,
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[Continued on next page]

(54) Title: SYSTEMS AND METHODS FOR REDUCING COLLISIONS AFTER TRAFFIC INDICATION MAP PAGING

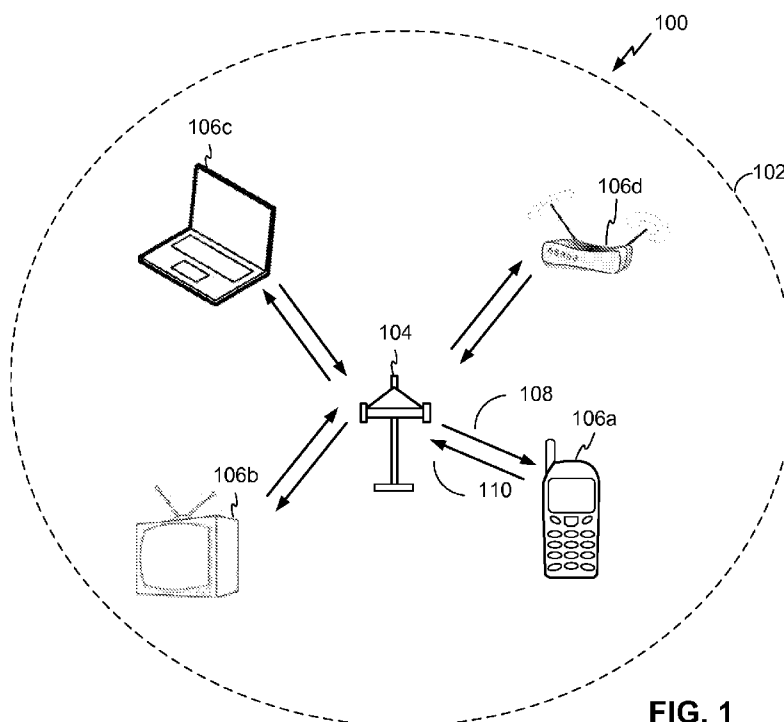


FIG. 1

(57) Abstract: Systems, methods, and devices for reducing collisions in a wireless communications network are described herein. In some aspects, a receiver receives a paging message. The paging message includes an ordering and a multiplier. A processor determines a first wake-up time based on the ordering and the multiplier. The wireless device wakes up at the determined wake-up time. The wireless device receives data via the receiver.



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, 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, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

INV. H04W52/02

ADD. H04W68/00 H04W28/04

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.
Y	US 2011/274040 A1 (PANI DIANA [CA] ET AL) 10 November 2011 (2011-11-10) paragraph [0002] - paragraph [0004] paragraph [0073] - paragraph [0078] claim 12	1-72
Y	----- US 2011/199905 A1 (PINHEIRO ANA LUCIA [US] ET AL) 18 August 2011 (2011-08-18) paragraph [0002] - paragraph [0015] paragraph [0193] - paragraph [0202]	1-72
Y	----- US 2010/002665 A1 (OGUCHI NAOKI [JP]) 7 January 2010 (2010-01-07) paragraph [0002] - paragraph [0023] ----- -/-	1-72



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

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search

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Name and mailing address of the ISA/

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Vaskimo, Kimmo

INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 2008/032662 A1 (TU ALEX KUANG-HSUAN [US]) 7 February 2008 (2008-02-07) paragraph [0001] - paragraph [0009] paragraph [0023] - paragraph [0029] paragraph [0047] -----	1-72
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A	US 8 060 054 B1 (DINAN ESMAIL [US] ET AL) 15 November 2011 (2011-11-15) the whole document -----	1,19,37, 55
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/029162

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-72

A method for reducing collisions, where a paging message is received at a wireless device, where a wake-up time is determined based on data in the paging message, and where the mobile wakes up at the determined wake-up time to receive data.

2. claims: 73-92

A method for reducing collisions, where an advertisement of an extended sleep period is transmitted at a wireless device, where a wireless device sleeps through one or more paging messages, where a request for data is transmitted, and where data is received.

INTERNATIONAL SEARCH REPORT

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