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(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, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, 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, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) Title: SYSTEM AND METHOD FOR MULTI-CHANNEL FREQUENCY HOPPING SPREAD SPECTRUM COMMUNICATION

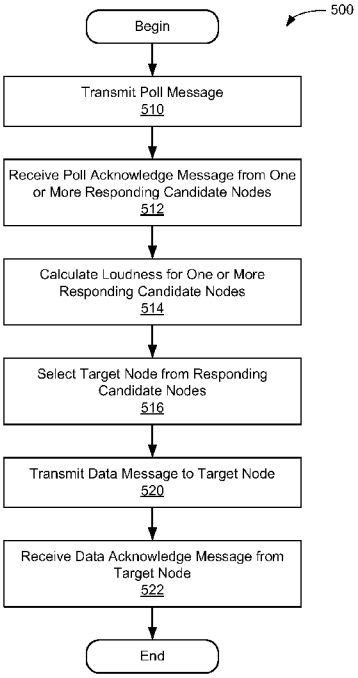


Figure 5

(57) Abstract: One embodiment of the present invention sets forth a technique for transmitting data in a frequency hopping spread spectrum (FHSS) wireless communication system. A multi-channel receiver is configured to receive data from one or more channels simultaneously. The multi-channel receiver enables efficient implementation of a transmission protocol in which multiple candidate nodes within a wireless mesh network are polled for availability to receive a packet of data. The packet of data is transmitted to one or more available nodes based on prevailing link conditions, thereby increasing the likelihood of successful delivery. Data flooding may be selectively implemented to further increase the likelihood of successful delivery.

WO 2013/126736 A3

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).

Published:

— *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
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A. CLASSIFICATION OF SUBJECT MATTER
INV. H04W72/04 H04W88/04
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 H04B

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	US 2010/040042 A1 (VAN GREUNEN JANA [US] ET AL) 18 February 2010 (2010-02-18) abstract figure 1 paragraphs [0010], [0012], [0014], [0023], [0024]	1,12,24, 33
X	US 2011/103299 A1 (SHUEY KENNETH C [US]) 5 May 2011 (2011-05-05)	1,3,13, 22,24, 32,33,41
Y	paragraphs [0008], [0009], [0058], [0059], [0101], [0119] - [0125] figures 1,8	14,15,23

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[X] Further documents are listed in the continuation of Box C.

[X] 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
14 June 2013	12/09/2013

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Kesting, Christiane

2

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PETROS SPACHOS ET AL: "Performance Comparison of Opportunistic Routing Schemes in Wireless Sensor Networks", COMMUNICATION NETWORKS AND SERVICES RESEARCH CONFERENCE (CNSR), 2011 NINTH ANNUAL, IEEE, 2 May 2011 (2011-05-02), pages 271-277, XP031869921, DOI: 10.1109/CNSR.2011.46 ISBN: 978-1-4577-0040-8 paragraphs [III.B] - [III.E.]	1,2,24, 33
Y	US 7 983 230 B1 (LI DON [US] ET AL) 19 July 2011 (2011-07-19) columns 3,5	14
Y	EP 1 793 637 A1 (BOSCH GMBH ROBERT [DE]) 6 June 2007 (2007-06-06) paragraphs [0008] - [0011], [0015], [0023] - [0024]	15
Y	EP 1 526 692 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 27 April 2005 (2005-04-27) paragraphs [0008], [0009], [0021], [0027], [0034] figures 4,9	23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/027370

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.:

1-3, 12-15, 22-24, 32, 33, 41

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: 1-3, 12-15, 22-24, 32, 33, 41

   Method, apparatus and storage medium for managing transmission channels

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2. claims: 4-6

   Method for determining a signal type

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3. claims: 7-11, 25-27, 34-36

   Method, apparatus and storage medium for concurrently receiving poll messages from different sources

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4. claims: 16-21, 28-31, 37-40

   Method, apparatus and storage medium for selecting a destination node

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5. claims: 42-62

   Method, apparatus and storage medium for sampling a radio signal

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/027370

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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