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[Continued on next page]

(54) Title: METHOD AND DEVICES FOR OBSCURING DEVICE IDENTIFIER

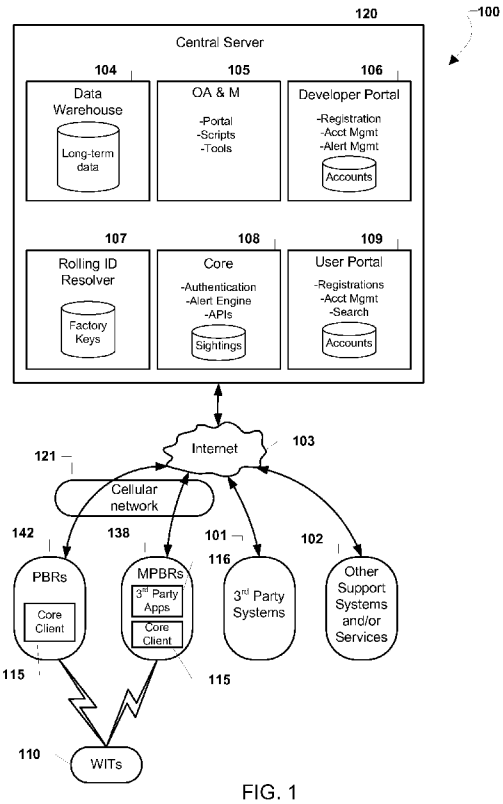

FIG. 1

(57) Abstract: Methods, systems and devices enable synchronizing obscured identification information between a wireless identity transmitter (110) and a central server (120) to support one-way communication of the obscured identification information to the central server. The wireless identity transmitter (110) may be a compact device configured to broadcast messages, such as through Bluetooth ® advertisements, including an obscured identifier for receipt and relay to the central server (120) by proximate proximity broadcast receivers (138, 142) via sighting messages that may also include location information. The central server (120) may decode received identification codes to identify the wireless identity transmitter. The wireless identity transmitter may create message data by concatenating identifying information with an incrementing nonce, encrypting the concatenated information, and truncating the encrypted information. Alternatively, concatenated identification information may be encrypted with a pseudo-random function and a secret key known by the central server. The central server that may compare received data to pre-calculated encrypted data.

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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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— *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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A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/06 H04W12/02 H04L9/18 G01S1/02
ADD. H04W84/22 G06Q30/02 H04L29/08

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)
H04L H04W G06Q G01S

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, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HUN-WOOK KIM ET AL: "Symmetric Encryption in RFID Authentication Protocol for Strong Location Privacy and Forward-Security", HYBRID INFORMATION TECHNOLOGY, 2006. ICHIT '06, IEEE, PISCATAWAY, NJ, USA, 9 November 2006 (2006-11-09), pages 718-723, XP032070247, DOI: 10.1109/ICHIT.2006.253688 ISBN: 978-0-7695-2674-4	1-5, 27-31, 53-57, 79-83
A	the whole document	6-23, 32-49, 58-75, 84-101, 105-115

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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
19 August 2013	27/08/2013

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	Ströbeck, Anders

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.
A	EP 2 200 218 A1 (BCE INC [CA]) 23 June 2010 (2010-06-23) paragraph [0041] - paragraph [0057] paragraph [0078] - paragraph [0089] -----	1-23, 27-49, 53-75, 80-101, 105-115
A	EP 1 626 363 A1 (NTT DOCOMO INC [JP]) 15 February 2006 (2006-02-15) paragraph [0019] - paragraph [0044] -----	1-23, 27-49, 53-57, 80-101, 105-115
A	GENE TSUDIK ED - NIKITA BORISOV ET AL: "A Family of Dunces: Trivial RFID Identification and Authentication Protocols", 20 June 2007 (2007-06-20), PRIVACY ENHANCING TECHNOLOGIES; [LECTURE NOTES IN COMPUTER SCIENCE], SPRINGER BERLIN HEIDELBERG, BERLIN, HEIDELBERG, PAGE(S) 45 - 61, XP019073083, ISBN: 978-3-540-75550-0 page 48, line 20 - page 53, line 11 -----	1-23, 27-49, 53-75, 80-101, 105-115
A	YANJUN ZUO: "Secure and private search protocols for RFID systems", INFORMATION SYSTEMS FRONTIERS ; A JOURNAL OF RESEARCH AND INNOVATION, KLUWER ACADEMIC PUBLISHERS, BO, vol. 12, no. 5, 28 August 2009 (2009-08-28), pages 507-519, XP019863478, ISSN: 1572-9419, DOI: 10.1007/S10796-009-9208-6 page 510, left-hand column, line 8 - page 512, left-hand column, line 4 page 514, left-hand column, line 1 - line 37 -----	1-23, 27-49, 53-75, 80-101, 105-115
A	CHAUDHRY M A R ET AL: "Protocols stack and connection establishment in bluetooth radio", STUDENTS CONFERENCE, 2002. ISCON '02. PROCEEDINGS. IEEE AUG. 16-17, 2002, PISCATAWAY, NJ, USA,IEEE, vol. 1, 16 August 2002 (2002-08-16), pages 48-55, XP010647264, ISBN: 978-0-7803-7505-5 the whole document -----	24-26, 50-52, 76-78, 102-104, 116-128

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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008/187137 A1 (NIKANDER PEKKA [FI] ET AL) 7 August 2008 (2008-08-07) paragraph [0073] - paragraph [0089] -----	24-26, 50-52, 76-78, 102-104, 116-128
A	WO 2010/117364 A1 (NOKIA CORP [US]; NOKIA INC [US]; KASSLIN MIKA ILKKA TAPANI [FI]; EKBER) 14 October 2010 (2010-10-14) page 2, line 5 - last line page 6, line 9 - page 8, last line -----	24-26, 50-52, 76-78, 102-104, 116-128

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/027409

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

Information on patent family members

International application No
PCT/US2013/027409

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2200218 A1	23-06-2010	NONE	
EP 1626363 A1	15-02-2006	CN 1734463 A	15-02-2006
		EP 1626363 A1	15-02-2006
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		US 2008187137 A1	07-08-2008
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		US 2012042098 A1	16-02-2012
		WO 2010117364 A1	14-10-2010

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-23, 27-49, 53-75, 79-101, 105-115

   Method and devices for protecting privacy and prevent unauthorised tracking of wireless identity transmitters.

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2. claims: 24-26, 50-52, 76-78, 102-104, 116-128

   Method and devices for configuring a wireless identity transmitter.
