



(51) International Patent Classification:

G01S 5/00 (2006.01) H04W 52/36 (2009.01)
H04W 64/00 (2009.01) H04B 17/00 (2015.01)
H04W 52/16 (2009.01) H04W 8/00 (2009.01)
H04W 52/24 (2009.01)

(21) International Application Number:

PCT/US2014/028307

(22) International Filing Date:

14 March 2014 (14.03.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

13/843,484 15 March 2013 (15.03.2013) US

(71) Applicant: WHISTLE LABS, INC. [US/US]; 251 Rhode Island Street, Suite 211, San Francisco, California 94103 (US).

(72) Inventors: AIUTO, Chris; 251 Rhode Island Street, Suite 211, San Francisco, California 94103 (US). LLOYD, Kevin; 251 Rhode Island Street, Suite 211, San Francisco, California 94103 (US). KRİKORIAN, Jason; 251 Rhode Island Street, Suite 211, San Francisco, California 94103 (US).

(74) Agents: SELLARS, Eric L. et al.; 1 Almaden Blvd., Floor 12, San Jose, California 95113 (US).

(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, IR, IS, JP, KE, KG, 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, SA, 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.

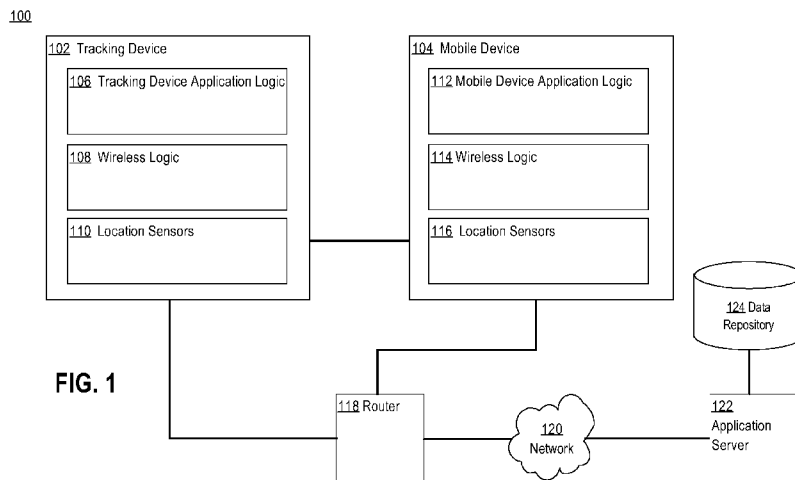
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, 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, KM, ML, MR, NE, SN, TD, TG).

Published:

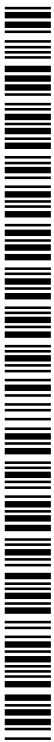
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:
22 January 2015

(54) Title: DETECTING INTERACTION AMONG ENTITIES VIA PROXIMITY



(57) Abstract: Approaches, techniques, and mechanisms are disclosed for determining interaction among animals via proximity relationships. An interaction between two or more animals may generally refer to any action by an animal that influences one or more other animals and that may be inferred based on a detected physical proximity relationship between the animals. Proximity relationships between animals may be detected based on determining an approximate physical distance between computing devices associated with the animals. Proximity relationships between animals may be detected based on detecting the co-location of computing devices associated with the animals.



INTERNATIONAL SEARCH REPORT

International application No PCT/US2014/028307

A. CLASSIFICATION OF SUBJECT MATTER
 INV. G01S5/00 H04W64/00 H04W52/16 H04W52/24 H04W52/36
 H04B17/00
 ADD. H04W8/00
 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)
 G01S 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 A	GB 2 309 843 A (NEC CORP [JP]) 6 August 1997 (1997-08-06) abstract page 6, lines 1-25 page 8, line 19 - page 9, line 13 page 11, line 23 - page 12, line 23 page 14, line 1 - page 16, line 20 claim 1; figure 3 -----	1-6, 11-16, 21-23 7-10, 17-20
X A	WO 2012/027505 A2 (EUCLID [US]; LEUNG KENNETH MAN-KIN [US]; SMITH WILLIAM TOLBERT [US]; W) 1 March 2012 (2012-03-01) abstract paragraphs [0024] - [0038], [0049], [0051], [0056] - [0059], [0066] - [0074] ----- -/--	7-10, 17-20 1-6, 11-16, 21-23

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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 3 December 2014	Date of mailing of the international search report 11/12/2014
--	--

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

INTERNATIONAL SEARCH REPORT

International application No PCT/US2014/028307

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 2012/249300 A1 (AVITAL SHLOMO [IL] ET AL) 4 October 2012 (2012-10-04) abstract paragraphs [0001], [0014], [0021] - [0027] -----	1-23
A	EP 2 073 514 A2 (LG ELECTRONICS INC [KR]) 24 June 2009 (2009-06-24) abstract paragraphs [0003] - [0007], [0010], [0079] - [0081], [0085], [0089] - [0091] -----	1-23
A	US 2009/221298 A1 (HANNER CHRISTIAN THOMAS [SE]) 3 September 2009 (2009-09-03) abstract paragraphs [0006], [0007], [0016], [0024], [0025], [0040], [0049], [0057], [0058] -----	1-23
A	WO 2005/091915 A2 (AIRESpace INC [US]) 6 October 2005 (2005-10-06) abstract paragraphs [0011], [0012], [0017], [0018], [0022], [0030], [0033], [0034], [0036], [0041], [0043], [0048] - [0052] -----	1-23
A	US 2011/149934 A1 (DICKSON JR LEWIS WILLIAM [US] ET AL) 23 June 2011 (2011-06-23) abstract paragraphs [0005], [0006], [0012] - [0024] -----	1-23
A	US 2006/095349 A1 (MORGAN EDWARD J [US] ET AL MORGAN EDWARD JAMES [US] ET AL) 4 May 2006 (2006-05-04) abstract paragraphs [0007], [0020], [0061] - [0063] -----	1-23

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/028307

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2309843	A	06-08-1997	CA 2196499 A1	31-07-1998
			GB 2309843 A	06-08-1997
			JP 2865043 B2	08-03-1999
			JP H09215042 A	15-08-1997
			US 5926765 A	20-07-1999

WO 2012027505	A2	01-03-2012	CA 2809259 A1	01-03-2012
			EP 2609768 A2	03-07-2013
			JP 2013537785 A	03-10-2013
			US 2012163206 A1	28-06-2012
			US 2014229616 A1	14-08-2014
			WO 2012027505 A2	01-03-2012

US 2012249300	A1	04-10-2012	NONE	

EP 2073514	A2	24-06-2009	BR PI0805014 A2	18-08-2009
			CN 101466162 A	24-06-2009
			EP 2073514 A2	24-06-2009
			KR 20090066103 A	23-06-2009
			US 2009270093 A1	29-10-2009
			US 2012009924 A1	12-01-2012

US 2009221298	A1	03-09-2009	EP 2250515 A1	17-11-2010
			JP 4880782 B2	22-02-2012
			JP 2011518452 A	23-06-2011
			US 2009221298 A1	03-09-2009
			WO 2009106919 A1	03-09-2009

WO 2005091915	A2	06-10-2005	CA 2558394 A1	06-10-2005
			EP 1726169 A2	29-11-2006
			US 2005208952 A1	22-09-2005
			WO 2005091915 A2	06-10-2005

US 2011149934	A1	23-06-2011	NONE	

US 2006095349	A1	04-05-2006	AU 2005330513 A1	19-10-2006
			CA 2585495 A1	19-10-2006
			CN 101438270 A	20-05-2009
			CN 101980550 A	23-02-2011
			EP 1820120 A2	22-08-2007
			EP 2527859 A2	28-11-2012
			ES 2391566 T3	27-11-2012
			HK 1108037 A1	16-11-2012
			JP 4866361 B2	01-02-2012
			JP 5450529 B2	26-03-2014
			JP 2008519495 A	05-06-2008
			JP 2012039628 A	23-02-2012
			KR 20070120085 A	21-12-2007
			SG 157355 A1	29-12-2009
			US 2006095348 A1	04-05-2006
			US 2006095349 A1	04-05-2006
			US 2006106850 A1	18-05-2006
			US 2006217131 A1	28-09-2006
			US 2008132170 A1	05-06-2008
			US 2008139217 A1	12-06-2008
US 2009075672 A1	19-03-2009			
US 2011035420 A1	10-02-2011			
US 2011093443 A1	21-04-2011			

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2014/028307

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2011317579 A1	29-12-2011
		US 2013184003 A1	18-07-2013
		US 2014342752 A1	20-11-2014
		WO 2006110181 A2	19-10-2006
<hr/>			