(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property **Organization**

International Bureau





(10) International Publication Number WO 2012/162508 A3

- (51) International Patent Classification: G01 V3/12 (2006.01)
- (21) International Application Number:

PCT/US2012/039355

(22) International Filing Date:

24 May 2012 (24.05.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/489,680

25 May 201 1 (25.05.201 1)

US

- (71) Applicant (for all designated States except US): RAY¬ THEON COMPANY [US/US]; 870 Winter Street, Waltham, Massachusetts 02451-1449 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): NAQVI, Waseem [US/US]; 54 Butler Circle, Marlborough, Massachusetts 01752-1668 (US).
- (74) Agents: DURKEE, Paul, D. et al; Daly, Crowley, Mofford & Durkee, LLP, 354A Turnpike St., Suite 301A, Canton, Massachusetts 02021 (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, 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, 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.

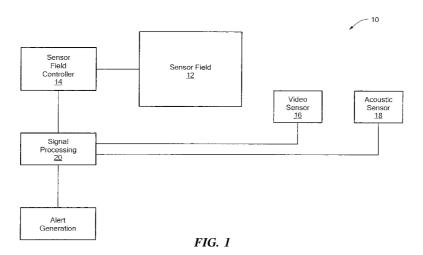
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE,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

20 June 2013

(54) Title: METHOD AND APPARATUS FOR OBJECT/MATERIAL DETECTION



(57) Abstract: Methods and apparatus to compare the size of a target from the first sensor information with the size of the target from the second sensor information to determine whether an anomaly exists based upon the size comparison. In one embodiment, the size of the target from the first sensor information is affected by dielectric constants for at least one material of interest associated with the target.



INTERNATIONAL SEARCH REPORT

International application No PCT/US2012/039355

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01V3/12

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) ${\tt G01V} \quad {\tt G08B}$

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 RELE	VANT
------------------------------------	------

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
Х	WO 99/21148 Al (IDS INTELLIGENT DETECTION SYST [CA]; HALEY LAWRENCE V [CA]) 29 April 1999 (1999-04-29)	1-4, 6-11,13, 14,16-19	
Y	pages 4,5; figure 1	5,12,15	
A	US 2005/230604 Al (ROWE RICHARD L [US] ET AL) 20 October 2005 (2005-10-20) paragraphs [0024] - [0026], [0028] - [0030], [0034] - [0039], [0056], [0060]; figures 1,2,5	1-19	
A	US 6 831 590 Bl (STEINWAY WILLIAM [US] ET AL) 14 December 2004 (2004-12-14) columns 1-3,5,6; figures 1,2,5	1-19	
Y	W0 2004/003591 Al (IT H0EJSKOLEN [DK]; S0ERENSEN JOHN ERIK AASTED [DK]) 8 January 2004 (2004-01-08) pages 5,13,14; figure 1	5,12,15	

 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" documentwhich may throw doubts on priority claim(s) orwhich 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

15 April 2013

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

Bream, Philip

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2012/039355

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9921148 Al	29-04-1999	CA 2308747 A1 EP 1025554 A1 JP 2001521157 A WO 9921148 A1	29-04-1999 09-08-2000 06-11-2001 29-04-1999
US 2005230604 A	. 20- 1 0 -2005	CN 1998011 A EP 1756761 A2 JP 2007532907 A US 2005230604 A1 WO 2005101307 A2	11-07-2007 28-02-2007 15-11-2007 20-10-2005 27-10-2005
us 6831590 BI	. 14-12-2004	US 6831590 Bl US 2005099331 Al	14-12-2004 12-05-2005
WO 2004003591 AI	. 08-01-2004	AU 2003239787 Al EP 1516207 Al JP 4252533 B2 JP 2005535950 A WO 2004003591 Al	19-01-2004 23-03-2005 08-04-2009 24-11-2005 08-01-2004