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- (71) **Applicant:** PASSIVE EYE LIMITED [GB/GB]; Palladium House, 1-4 Argyll Street, London W1F 7LD (GB).
- (72) **Inventors:** HUANG, Jingjing; c/o Passive Eye Limited, Palladium House, 1-4 Argyll Street, London W1F 7LD (GB). RUSH, Jerome, Brian; c/o Passive Eye Limited, Palladium House, 1-4 Argyll Street, London W1F 7LD (GB).
- (74) **Agent:** WITHERS & ROGERS LLP; 4 More London Riverside, London SE1 2AU (GB).
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- with international search report (Art. 21(3))
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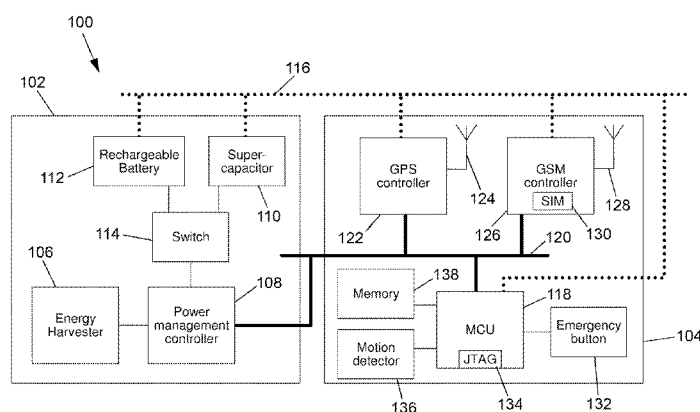
(54) **Title:** TRACKING DEVICE AND POWER MODULE

Fig. 1

(57) **Abstract:** A tracking device (100) comprises a power module (102) and a tracking operations module (104). The power module (102) includes two electrical power storage cells in the form of a super-capacitor (110) and a rechargeable battery (112); an energy harvester (106) for generating electrical power to charge the electrical power storage cells (110, 112) and a power management controller (108) arranged to control charging of the first (110) and second (112) power storage cells. The tracking operations module (104) includes a GPS module (122, 124) for receiving data about a location of the tracking device (100); a GSM module (126, 128) for transmitting the data about the location of the tracking device (100); a motion sensor (136); and processing means (118) arranged to: detect movement of the device (100) based on an output of the motion sensor (136); and manage receipt and transmission of the data about the location of the tracking device (100).

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2015/054164

A. CLASSIFICATION OF SUBJECT MATTER

INV. H02J7/34
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)
H02J

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	WO 2010/015856 A2 (G24 INNOVATIONS LTD [GB]; BELLAMY MARTIN JAMES [GB]) 11 February 2010 (2010-02-11) pages 14,15; figures 2,3,6,7,10	1-5, 7-10,12, 13,15,16 11 6
Y		
A		
X	JP 2012 029513 A (SELCO CORP) 9 February 2012 (2012-02-09) paragraphs [0020] - [0025]; figures 1,3	1,3-5, 7-10,14
X	EP 1 528 652 A2 (SHARP KK [JP]) 4 May 2005 (2005-05-04) paragraphs [0024], [0056], [0077] - [0080]; figures 2,5	1,4-10, 14
Y	EP 2 482 332 A1 (FALL MOHAMED PAPA TALLA [FR]) 1 August 2012 (2012-08-01) paragraphs [0079], [0149]; figure 13	11

☐ 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" 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

20 April 2016

Date of mailing of the international search report

08/07/2016

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

Varela Fraile, Pablo

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010015856 A2	11-02-2010	NONE	
JP 2012029513 A	09-02-2012	NONE	
EP 1528652 A2	04-05-2005	EP 1528652 A2	04-05-2005
		ES 2383891 T3	27-06-2012
		JP 3887635 B2	28-02-2007
		JP 2005160290 A	16-06-2005
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EP 2482332 A1	01-08-2012	CA 2825454 A1	02-08-2012
		CN 103380498 A	30-10-2013
		EP 2482332 A1	01-08-2012
		EP 2600488 A2	05-06-2013
		US 2014111015 A1	24-04-2014
		WO 2012100924 A1	02-08-2012

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2015/054164

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.:

1-16

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: 1-16

Power module with harvester, 2 energy storage devices and switch for power routing (1, 9); tracking device comprising power module (2)

1.1. claims: 3, 4

Types of energy storage devices involved

1.2. claims: 5-8, 15, 16

Priority of charging among energy storage devices

1.3. claims: 10, 11

Types of energy harvesters

1.4. claim: 12

Type of means for receiving location data

1.5. claim: 13

Type of means for transmitting location data

1.6. claim: 14

Type of processing means

2. claims: 17-21

Conditions for activation of reception and transmission of location data in a tracking device
