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[Continued on next page]

(54) Title: DISTRIBUTED REMOTE SENSING SYSTEM SENSING DEVICE

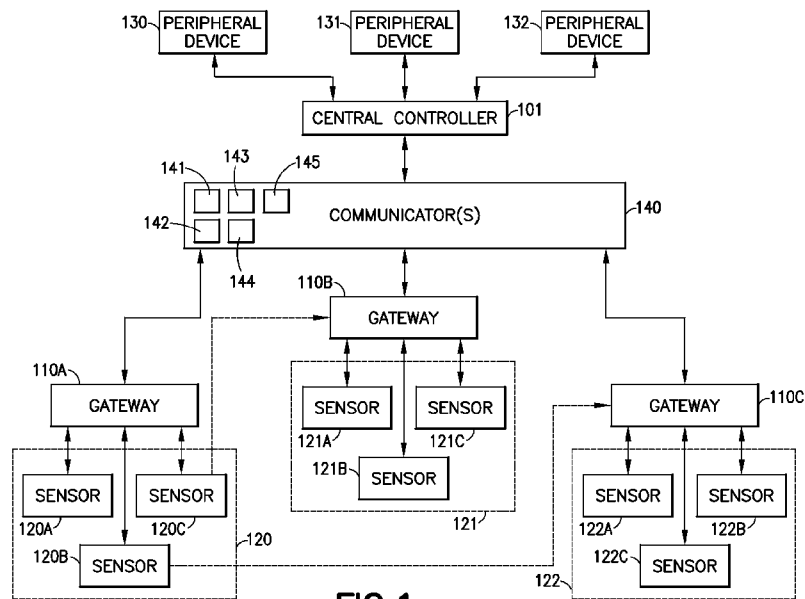


FIG. 1

(57) Abstract: A vehicle detection sensor apparatus including a frame and a dual mode sensor connected to the frame, the dual mode sensor having an active and a passive sensing mode wherein at least one of the active and passive sensing mode is automatically cycled between on and off states when providing a positive reading condition.

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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))*

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

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2014/038585

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(8) - B60R 21/00 (2014.01)
 CPC - B60R 21/0134 (2014.09)
 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)
 IPC(8) - B60R 21/00; G01S 13/00; G06F 19/00; G08G 1/16 (2014.01)
 USPC - 280/735; 701/45, 701/117, 701/301

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 CPC - B60N 2002/0272; B60R 21/0134; G01S 17/89; G07C 5/008 (2014.09) (keyword delimited)
 Search terms used: dual mode, active, passive, sensor, vehicle, detect, beam, timer, swithcing

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 PatBase, Google Patents, ProQuest

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,502,053 B1 (HARDIN et al) 31 December 2002 (31.12.2002) entire document.	1-12
Y	US 2006/0197650 A1 (JONES et al) 07 September 2006 (07.09.2006) entire document.	1-12
A	US 2011/0257935 A1 (DE GRAAF et al) 20 October 2011 (20.10.2011) entire document.	1-12
A	US 4,626,850 A (CHEY) 02 December 1986 (02.12.1986) entire document.	1-12
A	US 2004/0075582 A1 (BERGAN et al) 22 April 2004 (22.04.2004) entire document	1-12
A	US 5,182,564 A (BURKETT et al) 26 January 1993 (26.01.1993) entire document.	1-12

Further documents are listed in the continuation of Box C.

* 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 07 November 2014	Date of mailing of the international search report 25 NOV 2014
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2014/038585

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 last 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 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.:
1-12

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

International application No.

PCT/US2014/038585

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-12, drawn to a vehicle detection sensor apparatus comprising the dual mode sensor having an active and a passive sensing mode.

Group II, claims 13-17, drawn to a vehicle detection sensor apparatus comprising the dual mode sensor being embedded in a vehicle driving surface and providing omnidirectional vehicle detection

Group III, claims 18-40, drawn to a vehicle detection sensor apparatus comprising dual timers connected to the at least one vehicle detection sensor and the at least one communication module.

Group IV, claims 41-42, drawn to a vehicle detection sensor apparatus comprising at least one sensor; and a processor connected to the at least one sensor.

Group V, claim 43, drawn to a vehicle detection sensor apparatus comprising at least one pulse compression micro radar sensor

The inventions listed as Groups I, II, III, IV, or V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention: the dual mode sensor having an active and a passive sensing mode wherein at least one of the active and passive sensing mode is automatically cycled between on and off states when providing a positive reading condition as claimed therein is not present in the invention of Groups II, III, IV, or V. The special technical feature of the Group II invention: the dual mode sensor is embedded in a vehicle driving surface and provides omnidirectional vehicle detection within a predetermined zone of sensation as claimed therein is not present in the invention of Groups I, III, IV, or V. The special technical feature of the Group III invention: dual timers connected to the at least one vehicle detection sensor and the at least one communication module as claimed therein is not present in the invention of Groups I, II, IV, or V. The special technical feature of the Group IV invention: the at least one sensor and processor being disposed within the housing as claimed therein is not present in the invention of Groups I, II, III, or V. The special technical feature of the Group V invention: at least one pulse compression micro radar sensor with moving target resolution corresponding to each vehicle parking space within an array of vehicle parking spaces as claimed therein is not present in the invention of Groups I, II, III, or IV.

Groups I, II, III, IV, and V lack unity of invention because even though the inventions of these groups require the technical feature of a vehicle detection sensor apparatus comprising a frame, a sensor connected to the frame is not a special technical feature as it does not make a contribution over the prior art.

Specifically, US 2004/0075582 A1 (BERGAN et al) teaches a vehicle detection sensor apparatus comprising a frame; a sensor connected to the frame (fiber optic sensors can also be installed into a frame encasement. Still other intrusive sensors include passive magnetic devices which measure the change in the earth's magnetic flux created when a vehicle passes through a detection zone, para. 0077).

Since none of the special technical features of the Group I, II, III, IV or V inventions are found in more than one of the inventions, unity of invention is lacking.