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(54) Title: SYSTEM FOR COMMUNICATING INFORMATION FROM AN ARRAY OF SENSORS

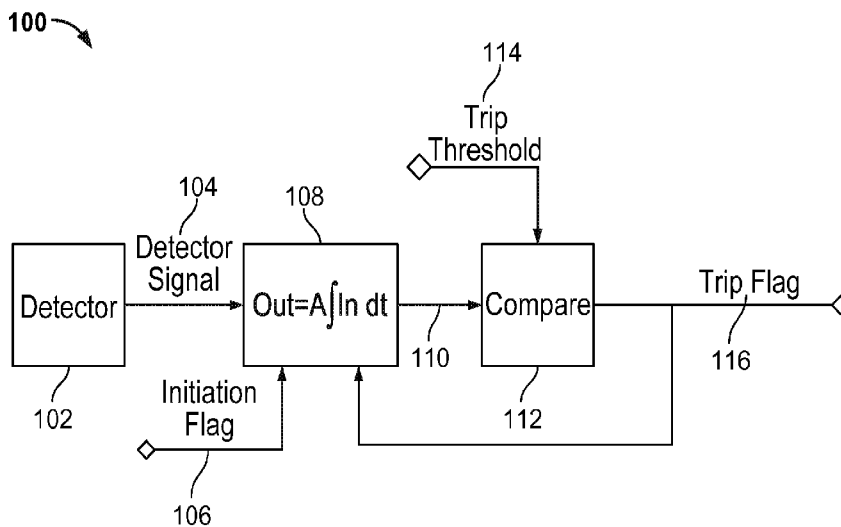


FIG. 1

(57) Abstract: A system for communicating information from an array of sensors is disclosed. The system comprises a sensor array that includes a plurality of sensors, wherein each sensor senses a physical property of a material that is in communication with the sensor. The system further comprises signal processing circuitry associated with each sensor that integrates the output of the sensor over time and compares the integrated output to a threshold. The system further comprises a communication network coupled to the signal processing circuitry that outputs information indicating that the integrated output corresponding to a given sensor has reached the threshold.

WO 2012/102797 A3

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US2011/064490

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC(8) - G08C 15/06 (2012.01)  
 USPC - 340/870.02  
 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) - G01R 19/00, 19/12; G08C 15/06 (2012.01)  
 USPC - 324/663, 665; 340/870.02

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)  
 PatBase, Google Patent Search, Google Scholar

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2011/0005918 A1 (AKESON et al) 13 January 2011 (13.01.2011) entire document	1-21
Y	US 6,686,997 B1 (ALLEN) 03 February 2004 (03.02.2004) entire document	1-21
Y	US 4,121,192 A (WILSON) 17 October 1978 (17.10.1978) entire document	2-6
Y	US 4,859,945 A (STOKAR) 22 August 1989 (22.08.1989) entire document	10
Y	US 2009/0102534 A1 (SCHMID et al) 23 April 2009 (23.04.2009) entire document	14-19
Y	US 2009/0073293 A1 (YAFFE et al) 19 March 2009 (19.03.2009) entire document	17-19

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search 18 October 2012	Date of mailing of the international search report <b>05 NOV 2012</b>
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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/US2011/064490

**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 extra 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.:  
1-21

**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/US2011/064490

Continuation of box III.

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 1-21, drawn to a system and method for communicating information comprising an array of sensors, a sensor array including a plurality of sensors, signal processing circuitry associated with each sensor that integrates the output of the sensor over time and compares the integrated output to a threshold; a communication network coupled to the signal processing circuitry that outputs information indicating that the integrated output corresponding to a given sensor has reached the threshold.

Group II, claims 22-52, drawn to a system and method for detecting properties of a molecular complex comprising electrically coupling an electrode to a molecular complex that outputs an electrical signal affected by an electrical property of a molecular complex, wherein the effect is characterized by an expected bandwidth; receiving the electrical signal from the electrode; selectively amplifying and integrating a portion of the electrical signal over time within a predetermined bandwidth, wherein the predetermined bandwidth is selected at least in part based on the expected bandwidth.

The inventions listed as Groups I-II 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: an array of sensors, signal processing circuitry associated with each sensor, a communication network coupled to the signal processing circuitry that outputs information indicating that the integrated output corresponding to a given sensor has reached the threshold, as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: a molecular complex, wherein the effect is characterized by an expected bandwidth, electrodes, selectively amplifying and integrating a portion of the electrical signal over time within a predetermined bandwidth, wherein the predetermined bandwidth is selected at least in part based on the expected bandwidth, as claimed therein is not present in the invention of Groups I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of detecting and sensing a physical property of a material that is in communication with a sensor, processing signals from the sensor. this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2004/0146863 A1 (PISHARODY et al) 29 July 2004 (26.07.2004) abstract; paragraphs 26, 56.

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