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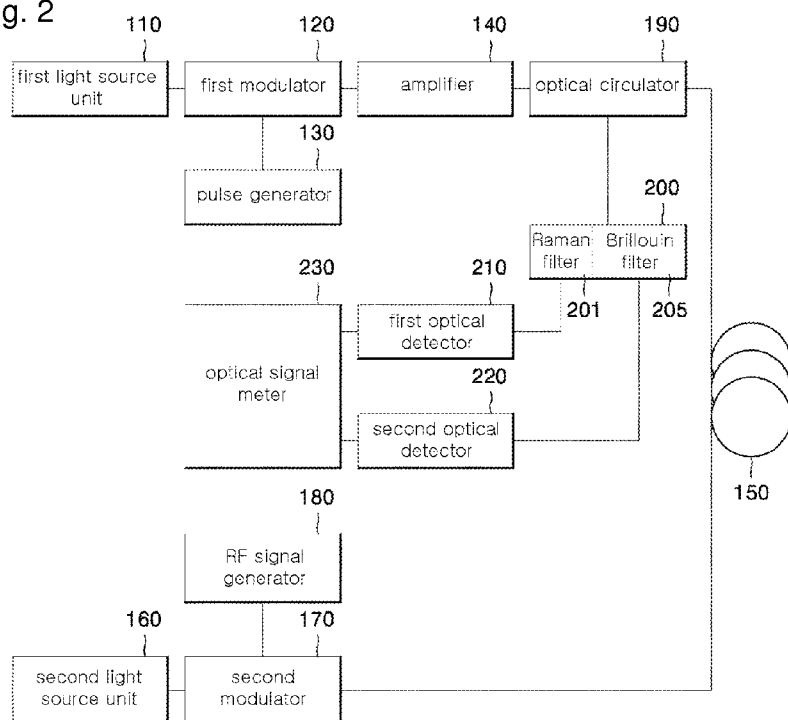
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(54) Title: DISTRIBUTED OPTICAL FIBER SENSOR SYSTEM

Fig. 2



(57) Abstract: A distributed optical fiber sensor system is provided. In this system, backward-scattered light generated in a test optical fiber is filtered to separate the backward-scattered light into Raman scattered light and Brillouin scattered light. The separated Raman scattered light and Brillouin scattered light are each converted into digital data. A change in temperature with respect to the distance of the test optical fiber is measured from the digital data of the Raman scattered light. A change in temperature and a change in the degree of deformation with respect to the distance of the test optical fiber are measured from the digital data of the Brillouin scattered light. The change in temperature and the change in the degree of deformation with respect to the distance of the test optical fiber are separately output using the measured data.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2008/003724**A. CLASSIFICATION OF SUBJECT MATTER****G02B 6/00(2006.01)i**

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 G02B 6, G01L, G08B, G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for utility models since 1975

Japanese Utility models and applications for utility models since 1975

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

eKIPASS(KIPO internal) "Brillouin", "Raman", "distributed optical sensor"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 04-248426 A (HITACHI CABLE LTD.) 3 September 1992 See paragraphs [0012] - [0030] and figures 1-2	1-10
Y	KR 10-2002-0090468 A (SEGI ENGINEERING CO., LTD. et al.) 5 December 2002 See the abstract, claim 1 and figure 3	1-10
A	US 5,949,533 A (ZHIXIEN LEE et al.) 7 September 1999 See column 6, line 22 - column 8, line 11 and figure 1	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

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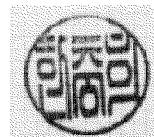
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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 04-248426 A	03.09.1992	None	
KR 10-2002-0090468 A	05.12.2002	None	
US 5949533 A	07.09.1999	EP 0887624 A2 JP 11-023415 A	30.12.1998 29.01.1999