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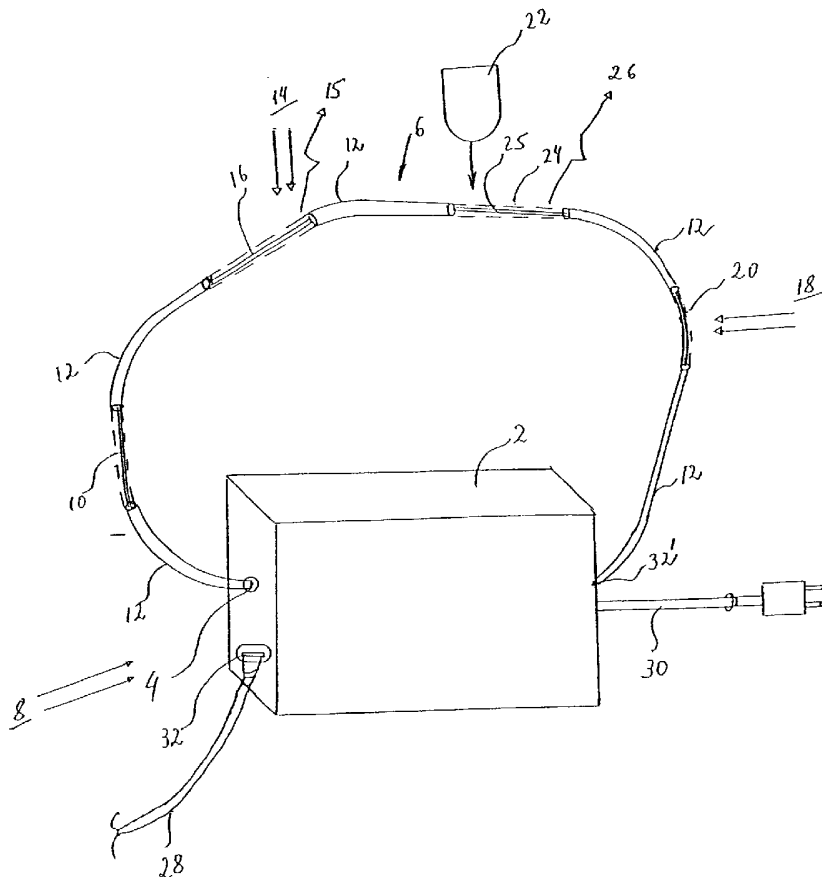
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US 09/923,731 (CON)
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[Continued on next page]

(54) Title: SYSTEM, ASSEMBLY AND METHODS FOR SENSING



(57) Abstract: A distributed fiberoptic radiation sensor is described which may employ one or more radiation sensor elements distributed in a single optical fiber. Such optical fibers may be placed on surfaces, or even within parts, to unobtrusively measure radiation in precise and even difficult to reach locations. Different sensor elements may respond to different radiation types and wavelength ranges, with each sensor element causing a different wavelength of light to be emitted or absorbed within the fiber.



WO 03/014716 A3



ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
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GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/24471

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01T1/105 G01N21/77

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 7 G01T G01N

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 006 (P-326), 11 January 1985 (1985-01-11) & JP 59 155775 A (DAINICHI NIPPON DENSEN KK), 4 September 1984 (1984-09-04) abstract ---	1,2
X	US 4 820 917 A (IOANNOU JOHN T) 11 April 1989 (1989-04-11) claim 1 ---	1-3
X	US 5 030 834 A (LINDMAYER JOSEPH ET AL) 9 July 1991 (1991-07-09) figure 1 ---	1,2
X	US 6 087 666 A (HUSTON ALAN L ET AL) 11 July 2000 (2000-07-11) figure 1 ---	1,2
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Further documents are listed in the continuation of box C.

Patent family members are listed in 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 document 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

24 April 2003

Date of mailing of the international search report

11. 07. 2003

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/24471

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1997, no. 08, 29 August 1997 (1997-08-29) & JP 09 090039 A (FURUKAWA ELECTRIC CO LTD:THE), 4 April 1997 (1997-04-04) abstract</p> <p>---</p>	
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1999, no. 09, 30 July 1999 (1999-07-30) & JP 11 118933 A (TOHOKU ELECTRIC POWER CO INC;MITSUBISHI HEAVY IND LTD), 30 April 1999 (1999-04-30) abstract</p> <p>---</p>	
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1998, no. 08, 30 June 1998 (1998-06-30) & JP 10 082861 A (HITACHI LTD), 31 March 1998 (1998-03-31) abstract</p> <p>---</p>	
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1998, no. 01, 30 January 1998 (1998-01-30) & JP 09 236669 A (TOHOKU ELECTRIC POWER CO INC;MITSUBISHI HEAVY IND LTD), 9 September 1997 (1997-09-09) abstract</p> <p>-----</p>	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/24471

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any additional fee.
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.:

1-3, 12

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

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: 1-3,12

sensing system and method for observing laterally escaping light

2. Claims: 4,5,9-11,25

system and method for sensing a flow of material onto an optical fiber

3. Claims: 6-8,17-21,24

system and method for sensing radiation incident on a plurality of radiation responsive elements or the effects of different phenomena on one sensing optical fiber

4. Claims: 13-16

system and method for sensing cumulative exposure to radiation

5. Claims: 22,23

method for sensing using an optical test signal

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 02/24471

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 59155775	A	04-09-1984	NONE
US 4820917	A	11-04-1989	NONE
US 5030834	A	09-07-1991	US 4855603 A 08-08-1989 AT 81524 T 15-10-1992 DE 3875323 D1 19-11-1992 DE 3875323 T2 11-03-1993 EP 0318813 A1 07-06-1989 JP 2000692 A 05-01-1990 JP 2617785 B2 04-06-1997 US 5091653 A 25-02-1992
US 6087666	A	11-07-2000	WO 0062092 A1 19-10-2000
JP 09090039	A	04-04-1997	NONE
JP 11118933	A	30-04-1999	NONE
JP 10082861	A	31-03-1998	JP 3309728 B2 29-07-2002
JP 09236669	A	09-09-1997	NONE