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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

- with international search report (Art. 21(3))
- with amended claims (Art. 19(1))

- (88) Date of publication of the international search report:
8 December 2011

(54) Title: FIBER OPTIC PERSONNEL SAFETY SYSTEMS AND METHODS OF USING THE SAME

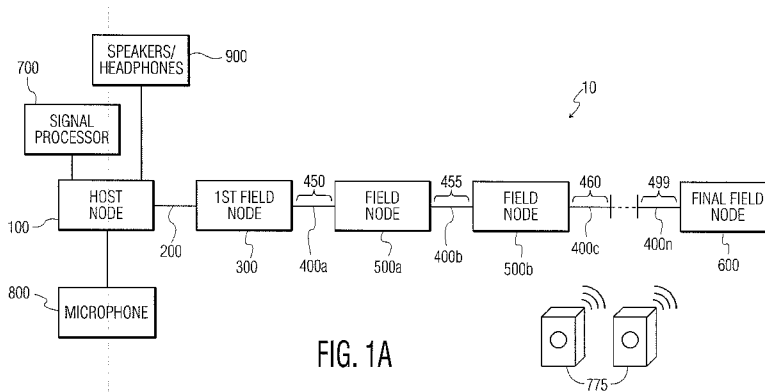


FIG. 1A

- (57) Abstract: A personnel monitoring system. The personnel monitoring system includes a host node having an optical source for generating optical signals, and an optical receiver. The personnel monitoring system also includes a plurality of fiber optic sensors for converting at least one of vibrational and acoustical energy to optical intensity information, each of the fiber optic sensors having: (1) at least one length of optical fiber configured to sense at least one of vibrational and acoustical energy; (2) a reflector at an end of the at least one length of optical fiber; and (3) a field node for receiving optical signals from the host node, the field node transmitting optical signals along the at least one length of optical fiber, receiving optical signals back from the at least one length of optical fiber, and transmitting optical signals to the optical receiver of the host node.

WO 2011/103271 A3

A. CLASSIFICATION OF SUBJECT MATTER**G08B 21/02(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)

G08B 21/02; H04Q 1/30; G08B 13/12; H04B 13/02; G08B 1/08; G08B 21/00; G01B 11/00; H04Q 7/28

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

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: personnel, tracking, communication, mine, fiber optic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0140852 A1 (STOLARCZYK LARRY G. et al.) 04 June 2009 See abstract, claim 1 and figures 1,2	1-40
A	US 2008-0137589 A1 (BARRETT JAMES P.) 12 June 2008 See abstract, claim 1 and figures 9-12	1-40
A	US 04879755A A (STOLARCZYK; LARRY G. et al.) 07 November 1989 See abstract, claims 1, 6, 21 and figures 1, 2	1-40
A	KR 10-1997-0002776 A (BAE YUN) 28 January 1997 See abstract and claim 1	1-40
A	US 6900726 B2 (EDWIN GRAVES) 31 May 2005 See abstract, claim 1 and figures 1-4	1-40
A	JP 2006-172339 A (COMSEC:KK et al.) 29 June 2006 See abstract, claim 1 and figure 1	1-40

 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 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

14 OCTOBER 2011 (14.10.2011)

Date of mailing of the international search report

17 OCTOBER 2011 (17.10.2011)

Name and mailing address of the ISA/KR

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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:

Claims 1-20 and 32-40 drawn to the technical feature for personnel monitoring system comprising of a host node including an optical source and an optical receiver.

Claims 21-31 drawn to the technical feature for operating a personnel monitoring system comprising: storing a plurality of predetermined characteristics of events in memory, comparing a detected characteristic obtained from the optical detection system system to the plurality of predetermined characteristics stored in memory and determining if there is an acceptable level of matching between the detected characteristic and at least one of the plurality of predetermined characteristics stored in memory.

Since the above mentioned groups of claims do not share any of the technical features identified, a technically special relationship between the inventions does not exist. Accordingly the claims do not

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.:

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

Information on patent family members

International application No.

PCT/US2011/025206

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0140852 A1	04.06.2009	None	
US 2008-0137589 A1	12.06.2008	None	
US 04879755A A	07.11.1989	CN 1012928 B CN 1034835 A CN 1034835 C0 EP 0292950 A2 EP 0292950 A3 JP 01-125129 A US 05093929A A US 05301082A A	19.06.1991 16.08.1989 09.10.1991 30.11.1988 18.07.1990 17.05.1989 03.03.1992 05.04.1994
KR 10-1997-0002776 A	28.01.1997	None	
US 6900726 B2	31.05.2005	US 2004-130445 A1 WO 2004-064002 A2 WO 2004-064002 A3	08.07.2004 29.07.2004 09.06.2005
JP 2006-172339 A	29.06.2006	None	