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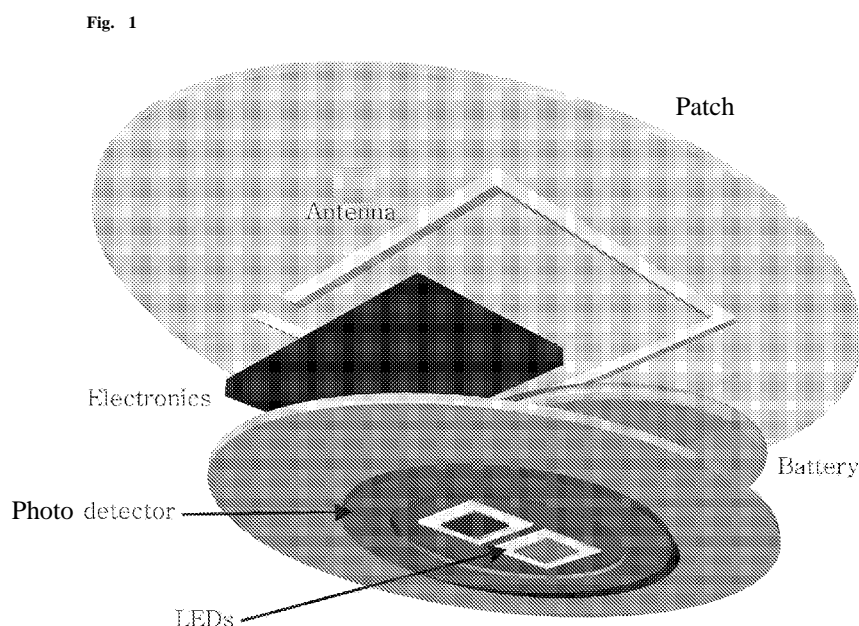
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, 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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- Published:  
— with international search report (Art. 21(3))

[Continued on next page]

(54) Title: A MONITORING SYSTEM



(57) Abstract: The present invention relates to a novel monitoring system suitable for attachment to a surface of a subject and for monitoring physiological signals of a subject wearing the system.



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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))*

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9 September 2011

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2010/070569

A. CLASSIFICATION OF SUBJECT MATTER  
INV. A61B5/00 A61B5/024 A61B5/0245 A61B5/0488 A61B5/08  
ADD.

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)  
A61B

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 , WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RASMUS G HAAHR ET AL: "A wearable 'electronic patch' for wireless continuous monitoring of chronically diseased patients" , MEDICAL DEVICES AND BIOSENSORS, 2008. ISSS-MDBS 2008. 5TH INTERNATIONAL SUMMER SCHOOL AND SYMPOSIUM ON, IEEE, PISCATAWAY, NJ, USA, 1 June 2008 (2008-06-01) , pages 66-70, XP031290412 , ISBN : 978-1-4244-2252-4	1-6,9 , 17-22 , 25-28, 31-33 , 36,37 , 39-45
Y	cited in the application the whole document  -----  -/- .	23-25 , 38,45

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 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

28 June 2011

Date of mailing of the international search report

12/07/2011

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
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Ojapi nski , Michael

## INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2010/070569

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/076343 AI (JAMES KRISTOFER J [US] ET AL) 19 March 2009 (2009-03-19)	1-9 , 17-22 , 26-28, 31-33 , 36,37 , 39-42 ,44
Y	figures 1-3 paragraphs [0029] , [0032] - [0039] , [0044] , [0057] , [0060] , [0077] - [0093] , [0118] , [0133] , [0137] - [0141] , [0143] , [0162]	23-25 , 38,43 ,45
X	----- Wo 01/50957 AI (KELLY PAUL B JR [US] ) 19 July 2001 (2001-07-19) page 19, line 2 - page 21, line 30 page 22, lines 11-20 page 22, line 31 - page 24, line 26 figures 1-10	1-4,7 , 8
Y	----- THOMAS JENSEN ET AL: "Independent component analysi s appl ied to pul se oximetry in the estimati on of the arteri al oxygen saturati on (SpO2) - a comparati ve study" , ENGINEERING IN MEDICINE AND BIOLOGY SOCI ETY, 2009 . EMBC 2009 . ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE, IEEE, PISCATAWAY, NJ , USA, 3 September 2009 (2009-09-03) , pages 4039-4044, XP031566484, ISBN : 978-1-4244-3296-7 the whol e document	23,24,38
Y	----- HAAHR R G ET AL: "A Novel Photodi ode for Refl ectance Pul se Oximetry in low-power appl icati ons" , ENGINEERING IN MEDICINE AND BIOLOGY SOCI ETY, 2007 . EMBS 2007 . 29TH ANNUAL INTERNATIONAL CONFERENCE OF THE IEEE, IEEE, PISCATAWAY, NJ , USA, 22 August 2007 (2007-08-22) , pages 2350-2353 , XP031336677 , ISBN : 978-1-4244-0787-3 secti on I, thi rd paragraph the whol e document	43
Y	----- US 5 273 036 A (KR0NBERG HARALD [DE] ET AL) 28 December 1993 (1993-12-28)	25,45
A	the whol e document	6, 17, 18, 20
X	----- wo 2005/092177 AI (BODYMEDIA INC [US] ) 6 October 2005 (2005-10-06) page 31, line 21 - page 32, line 12	1-4,7 , 8
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2010/070569

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	wo 2006/094513 A2 (COLOPLAST AS [DK] ; DELTA [DK] ; FAARBAEK SUSANNE HOLM [DK] ; HOPPE KARST) 14 September 2006 (2006-09-14) cited in the application the whole document paragraph [0361] -----	1-9 , 17-22

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP201Q/07Q569

## 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 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 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. :  
1-8, 25, 37-45 (completely) ; 9, 17-24, 26-28, 31-33 , 36(partial ly)
  
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.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-6, 37-44(completely) ; 9, 17-24, 26-28, 31-33 ,  
36(partially)  
a physiological multiparameter monitor with a staged  
detection scheme  
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2. claims: 7, 8(completely) ; 9, 17-24, 26-28, 31-33 , 36(partially)  
a physiological monitor activated by a non-physiological  
signal  
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3. claims: 10, 11 (completely) ; 17-24, 26-28, 31-33 , 36(partially)  
a physiological monitor with disposable parts  
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4. claims: 12-16, 29, 30(completely) ; 17-24, 26-28, 31-33 ,  
36(partially)  
specifications of the microelectronics and data  
communication of a physiological monitor  
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5. claims: 25, 45(completely) ; 26-28, 31-33 , 36(partially)  
a physiological monitor for measuring on the sternum  
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6. claims: 34, 35(completely) ; 36(partially)  
annular arrangement of optical components in an optical  
physiological monitor  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No <b>PCT/EP2010/070569</b>
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009076343	A1	19-03-2009	US 2009073991 A1 19-03-2009
			US 2009076346 A1 19-03-2009
			WO 2009036316 A1 19-03-2009
			WO 2009036333 A1 19-03-2009
-----			
WO 0150957	A1	19-07-2001	AU 2768001 A 24-07-2001
-----			
US 5273036	A	28-12-1993	NONE
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WO 2005092177	A1	06-10-2005	CA 2560323 A1 06-10-2005
			EP 1734858 A1 27-12-2006
			JP 2007530154 A 01-11-2007
			US 2005245839 A1 03-11-2005
			US 2008161715 A1 03-07-2008
			US 2008167572 A1 10-07-2008
			US 2008167573 A1 10-07-2008
			US 2008214949 A1 04-09-2008
-----			
WO 2006094513	A2	14-09-2006	AU 2006222414 A1 14-09-2006
			CA 2600427 A1 14-09-2006
			CN 101779949 A 21-07-2010
			EP 1871218 A2 02-01-2008
			HK 1118689 A1 02-02-2011
			JP 2008532596 A 21-08-2008
			US 2008275327 A1 06-11-2008
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