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[Continued on next page]

(54) Title: SYSTEMS, METHODS, AND DEVICES HAVING STRETCHABLE INTEGRATED CIRCUITRY FOR SENSING AND DELIVERING THERAPY

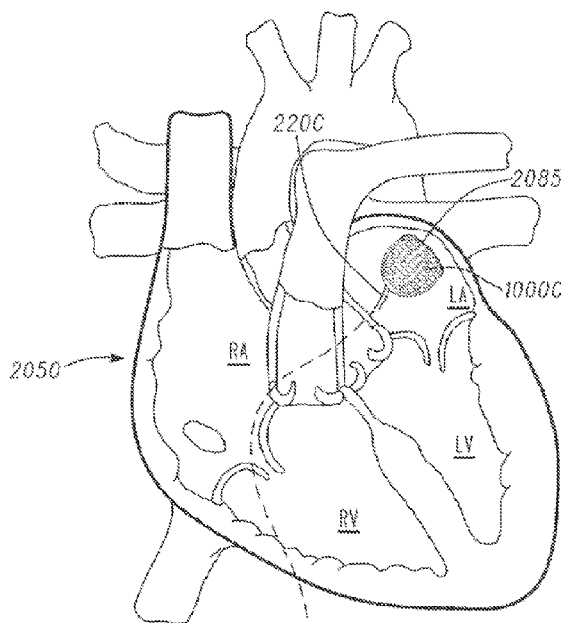


Fig. 43B

(57) Abstract: System, devices and methods are presented that integrate stretchable or flexible circuitry, including arrays of active devices for enhanced sensing, diagnostic, and therapeutic capabilities. The invention enables conformal sensing contact with tissues of interest, such as the inner wall of a lumen, a the brain, or the surface of the heart. Such direct, conformal contact increases accuracy of measurement and delivery of therapy. Further, the invention enables the incorporation of both sensing and therapeutic devices on the same substrate allowing for faster treatment of diseased tissue and fewer devices to perform the same procedure.



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ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

- *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))*
- *the filing date of the international application is within two months from the date of expiration of the priority period (Rule 26bis.3)*

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- *with international search report (Art. 21(3))*

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13 January 2011

**A. CLASSIFICATION OF SUBJECT MATTER****G01N 33/48(2006.01)i, A61B 18/24(2006.01)i, A61B 18/04(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)

G01N 33/48; B01L 3/02; A61B 5/04; A61N 1/05; G06K 9/62; A61B 5/00; G01L 1/04

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) &amp; Keywords: BIOSENSOR, BIOELECTRODE, EXPAND, STRETCH, SUBSTRATE and CIRCUIT

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009-0054742 A1 (BOZENA KAMINSKA et al.) 26 February 2009 See abstract, paragraphs [0045] - [0098] and figures 1 - 12	62-79,87-93 ,180-181
Y	US 2008-0008626 A1 (JIUM-MING LIN et al.) 10 January 2008 See abstract, paragraphs [0022] - [0031] and figures 1 - 5	62-79,87-93 ,180-181
A	US 2008-0054875 A1 (TAMIO SAITO) 6 March 2008 See abstract, paragraphs [0050] - [0136] and figures 1 - 33	1-27,34-80,87-205 ,216-217
A	US 2008-0140152 A1 (MIR A. IMRAN et al.) 12 June 2008 See abstract, paragraphs [0066] - [0093] and figures 6 - 25	1-27,34-80,87-205 ,216-217
A	US 5746207 A (JAMES ANDREW MCLAUGHLIN et al.) 5 May 1998 See abstract, column 5, line 23 - column 7, line 17 and figures 1 - 6	1-27,34-80,87-205 ,216-217

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

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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.: 206-212  
because they relate to subject matter not required to be searched by this Authority, namely:  
Claims 206-212 pertain to methods for treatment of human body by therapy, as well as diagnostic methods and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
2.  Claims Nos.: 28-33, 81-86, 214-215  
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:  
In claims 28-33, 81-86 and 214-215, the expression of "said therapeutic facility" is presented, which is not described before that expression. Hence claims 28-33, 81-86 and 214-215 are determined to lack clarity to such an extent that no meaningful international search can be carried out.
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:

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/US2010/027209**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0054742 A1	26.02.2009	None	
US 2008-0008626 A1	10.01.2008	TW 288067 B US 7805175 B2	11.10.2007 28.09.2010
US 2008-0054875 A1	06.03.2008	None	
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