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(54) Title: ACOUSTIC SYSTEM FOR MONITORING THE PERFORMANCE OF LEFT VENTRICLE ASSIST DEVICES AND OTHER MECHANICAL DEVICES IMPLANTED IN A PATIENT'S BODY

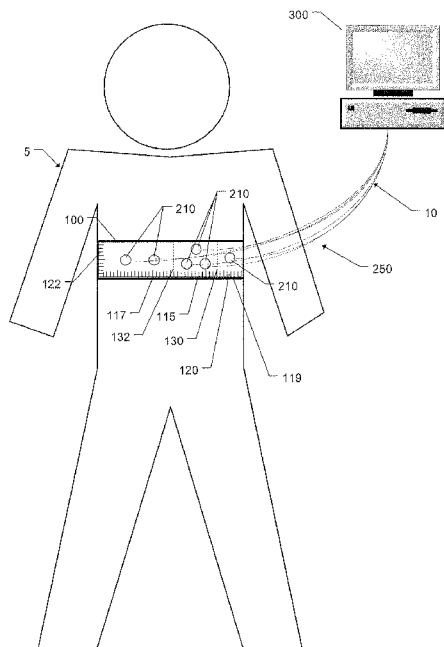


FIG. 1

(57) Abstract: Embodiments of the present invention are related to apparatus and methods for acoustically monitoring the performance of a medical device disposed within the body of a patient. According to one embodiment of an apparatus, the apparatus includes at least one acoustic sensor and a computer system that is connected to receive information from the acoustic sensor, wherein the acoustic sensor is adapted to receive a set of acoustic information that corresponds to acoustic activity within the body of said patient. The computer system is adapted for: (A) receiving the set of acoustic information, and (B) using the set of acoustic information to calculate location information relating to a location of a source of the acoustic activity.



WO 2010/120887 A3



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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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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

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

eKOMPASS(KIPO internal) & Keywords: "medical" and "acoustic" and "monitoring"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5938602 A1 (LLOYD; PETER GREGORY) 17 August 1999 See the abstract; figs. 1-4; column 5, line 4 - column 7, line 38.	1, 14, 20
Y	US 2004-0236239 A1 (MURRAY JIM et al.) 25 November 2004 See the abstract; figs. 1-3; paragraphs [0057]-[0105].	1, 14, 20
A	US 5844997 A1 (MURPHY, JR.; RAYMOND L. H.) 01 December 1998 See the abstract; figs. 1-4; column 3, line 30 - column 11, line 60.	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5938602 A1	17.08.1999	EP 0812568 A2	17.12.1997
		EP 0812568 A3	07.01.1998
		EP 0812568 B1	22.10.2003
		EP 1362553 A1	19.11.2003
		EP 1362553 B1	20.10.2004
		GB 2314158 A	17.12.1997
US 2004-0236239 A1	25.11.2004	AT 356576 T	15.04.2007
		AU 2002-330593 B2	31.07.2008
		CA 2460800 A1	13.02.2003
		DE 60218863 D1	26.04.2007
		DE 60218863 T2	29.11.2007
		EP 1416847 A2	12.05.2004
		EP 1416847 B1	14.03.2007
		GB 0118728 D0	26.09.2001
		WO 03-011132 A2	13.02.2003
		WO 0301-1132A3	03.04.2003
US 5844997 A1	01.12.1998	None	