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[Continued on next page]

(54) Title: A METHOD AND APPARATUS FOR AN IMPLANTABLE INERTIAL-BASED SENSING SYSTEM FOR REAL-TIME, IN VIVO DETECTION OF SPINAL PSEUDARTHROSIS AND ADJACENT SEGMENT MOTION

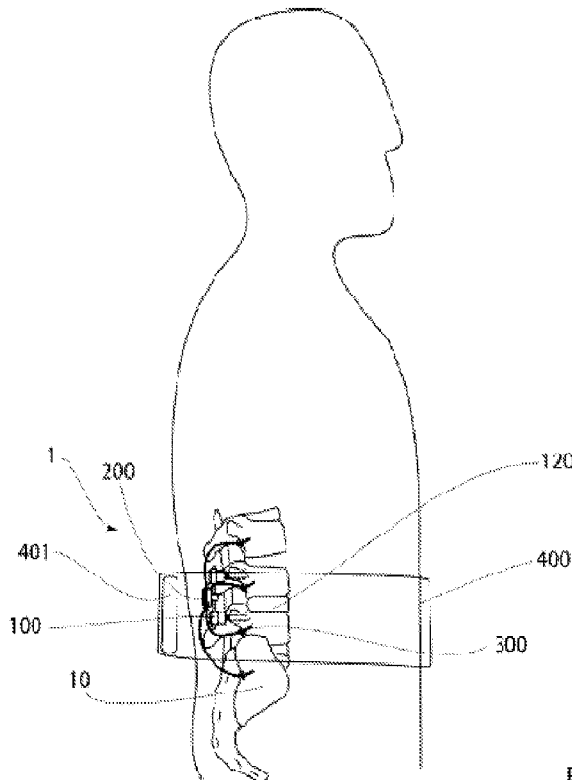


FIG. 1

(57) Abstract: A vertebral processor designed to collect and interpret data from multiple surgically implanted accelerometers. Each accelerometer is surgically implanted into a vertebra of a patient utilizing a bone screw. Additional accelerometers are implanted in adjacent vertebrae. The data from the accelerometers is compared by an algorithm to determine the relative movement of the accelerometers implanted in adjacent vertebrae. Data is generated via the algorithm and compared against the expected behavior of the surgically implanted accelerometers as if they were connected to a rigid body, thus determining the level of success of a spinal fusion procedure for those adjacent segments. The apparatus may be utilized with or without spinal stabilization hardware, and with or without fusion cages or artificial discs. The vertebral processor is supplemented by an external system worn by the patient, which provides for an inductive charging power source and for data transfer.

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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

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: spine, vertebral, sensor, orientation, accelerometer

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2006-0247773 A1 (CARL M. STAMP) 02 November 2006 See abstract, paragraph [0016]-[0036], claims 1-40, and figures 1-8.	1 2-20
Y A	US 2005-0273170 A1 (RICHARD NAVARRO et al.) 08 December 2005 See abstract, paragraph [0030]-[0060], claims 1-55, and figures 1-8.	1 2-20
A	US 2006-0036324 A1 (DAN SACHS et al.) 16 February 2006 See abstract, paragraph [0068]-[0076],[0122], claims 1-7, and figures 1-3.	1-20
A	US 2004-0068205 A1 (SUSAN W. ZOGBI et al.) 08 April 2004 See abstract, paragraph [0021]-[0067], claims 1-24, and figures 1-11.	1-20

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

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