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- (71) Applicant (for all designated States except US): UNIVER-
SITY OF SOUTHERN CALIFORNIA [US/US]; USC
Stevens, Hughes Center Suite EEB 131, 3740 McClintock
Avenue, Los Angeles, CA 90089-2561 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): RAPHAEL, David,
T. [US/US]; P.O.Box 4796, Valley Village, CA 91617 (US).
SHUNG, K., Kirk [US/US]; 881 Holladay Drive, Mon-
terey Park, CA 91754 (US).
- (74) Agents: BROWN, Marc, E. et al.; McDermott Will &
Emery LLP, 2049 Century Park East, Suite 3800, Los An-
geles, CA 90067 (US).

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(54) Title: ACOUSTIC BACK-SCATTERING SENSING SCREW FOR PREVENTING SPINE SURGERY COMPLICATIONS

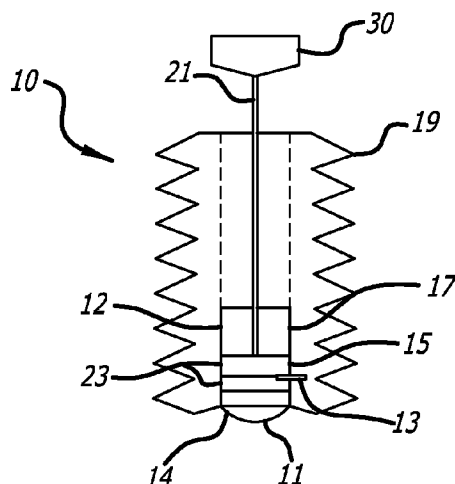


FIG. 2

(57) Abstract: A medical device having an implantable instrument configured to be implanted in bone tissue, the implantable instrument having an internal chamber configured to house at least one transducer; a transducer located within the internal chamber of the implantable instrument, the transducer configured to transmit a signal and to receive one or more reflections of that signal; and a signal processing system configured to process the signals transmitted and received by the transducer so as to provide information indicative of the acoustic impedance of matter in the vicinity of the implantable instrument after it is implanted into the bone tissue based on the signals transmitted and received by the transducer.

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B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) USPC: 606/323 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8): A61B17/84, 17/68, 17/58 USPC: 606/300, 301 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WEST (PGPB,USPT,USOC,EPAB,JPAB) Google (Patents, Scholar, and Web) Search Terms Used: implant transducer bone impedance signal processing spinal position needle aperture backscatter		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/0055311 A1 (NEUKERMANS et al.) 20 March 2003 (20.03.2003), entire document, especially para [0025], [0044], [0046], [0049], [0054], [0054], [0074], [0091]-[0095]	21, 22, 24-27, 32, 33, 35-38, 40, 41, 46, 50, 51
Y		1-20, 23, 28-31, 34, 39, 42-45, 47-49, 52-54
Y	US 2006/0269076 A1 (MILLER et al.) 30 November 2006 (30.11.2006), para [0063], [0070]	1-20, 42-45, 47, 52-54
Y	US 2005/0182320 A1 (STIFTER et al.) 18 August 2005 (18.08.2005), para [0024], [0027], [0028]	23, 28-30
Y	US 2002/0120192 A1 (NOLTE et al.) 29 August 2002 (29.08.2002), para [0022]	8, 16-18, 31, 34, 39
Y	US 5,771,310 A (VANNAH) 23 January 1998 (23.01.1998), col. 5, ln 8-13; col. 17, ln 16-23; col. 17, ln 61 - col. 18, ln 4	48, 49, 53, 54
Y	US 6,752,753 B1 (HOSKINS et al.) 22 June 2004 (22.06.2004), col. 1, ln 13-23; col. 1, ln 60-64; col. 26, ln 7-17	4-7
Y	US 2006/0241576 A1 (DIEDERICH et al.) 26 October 2006 (26.10.2006), Abstract, para [0369]	13, 54
Y	US 6,413,215 B1 (WU et al.) 2 July 2002 (02.07.2002), col. 3, ln 31-35	53, 54
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