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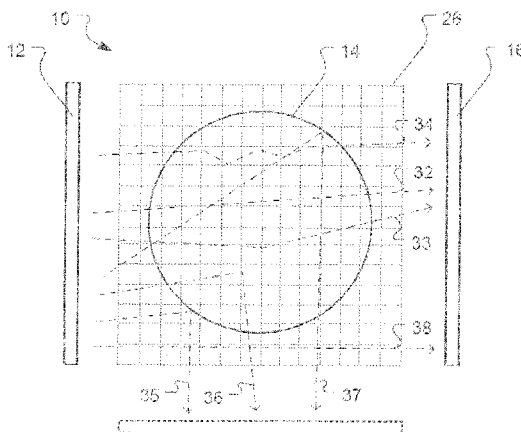


FIG. 1

(57) Abstract: Methods for imaging the internal structures of an object using an acoustic wave field are provided. In one aspect, for example, a method of imaging internals of a physical object using acoustic waves may include transmitting an acoustic wave field toward the object, receiving a resultant acoustic wave field with a receiver, where the resultant acoustic wave field is in response to the transmitted acoustic wave field reflected from or transmitted through the object, and determining a predicted resultant acoustic wave field derived from a model of the object. The method may also include determining a residual between the predicted resultant acoustic wave field and the resultant acoustic wave field, and back propagating the residual to determine corrections to the model of the object. In another aspect, the above recited steps may be further iterated to successively refine the model of the object over a number of iterations until a predefined condition is reached.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/006186**A. CLASSIFICATION OF SUBJECT MATTER***A61B 8/00(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)

IPC 8: A61B 8/00

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 since 1975
Japanese utility models and applications for utility models since 1975

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

eKIPASS(KIPO internal)
Keywords: predict, model, residual**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6027447 A (LI YUE) 22 February 2000 See figure 14 and claim 1	1-56
A	US 5806521 A (MORIMOTO A. K. et al.) 15 September 1998 See column 19 line 25~ column 23 line 10 and figure 1	1-56
A	US 6636584 B2 (JOHNSON S. A. et al.) 21 October 2003 See abstract and claim 1	1-56
A	US 5339815 A (LIU Y. et al.) 23 August 1994 See abstract and claim 1	1-56

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

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6027447 A	22.02.2000	AU 1996-44750 B2	14.08.1996
		AU 4475096 A	14.08.1996
		PN 317495 D0	22.06.1995
		JP 11-503927	06.04.1999
		US 6027447 A	22.02.2000
		US 6120450 A	19.09.2000
		WO 96-23387 A1	01.08.1996
US 5806521 A	15.09.1998	None	
US 6636584 B2	21.10.2003	US 2002-0131551 A1	19.09.2002
		US 2004-0034307 A1	19.02.2004
		US 6636584 B2	21.10.2003
US 5339815 A	23.08.1994	CA 2111937 A1	23.06.1994
		CA 2111937 C	06.06.2000
		GB 2273774 A	29.06.1994
		GB 2303211 A	12.02.1997
		GB 2303211 B	16.04.1997
		GB 9325823 D0	23.02.1994
		GB 9620918 D0	27.11.1996