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(71) Applicant (for all designated States except US): INOVISE MEDICAL, INC. [US/US]; Suite 100, 10565 SW Nimbus Avenue, Portland, OR 97223 (US).

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(72) Inventors: BAUMER, Martin; 1080 North Abeey Road, Carlton, OR 97111 (US). SAROYA, Jagtar, S.; 35900 SE Mt. Norway Drive, Washougal, WA 98671 (US).

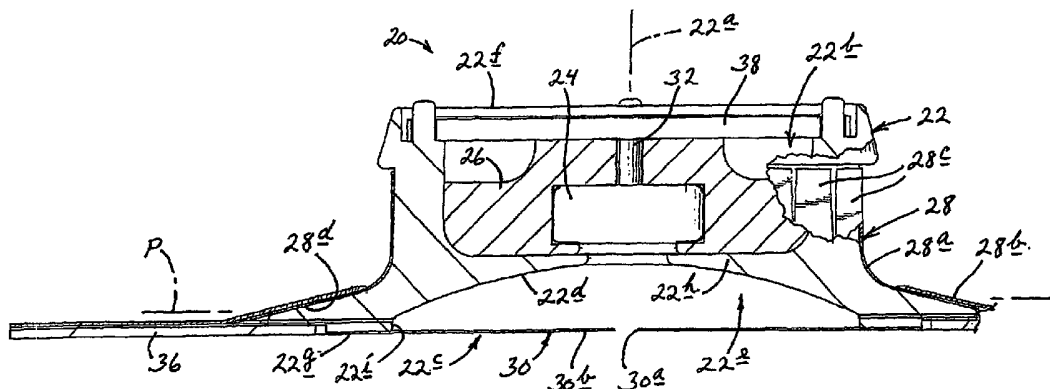
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(74) Agent: DICKINSON, Jon, M.; Jon M. Dickinson, P.C., 8015 Southeast 31st Avenue, Portland, OR 97202 (US).

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(54) Title: ELECTRICAL AND AUDIO ANATOMY-SIGNAL SENSOR SYSTEM



(57) Abstract: A sensor system for the combined, simultaneous, common-axis collection of heart-produced acoustical and electrical signals. The system includes (a) a hollow-interior body of revolution possessing an axis of revolution which is substantially coincident with the common signal-collection axis, (b) an electrode structure mounted on the outside of the body and disposed symmetrically with respect to the signal-collection axis, (c) a sound transducer disposed within the interior of the body, substantially centered on the signal-collection axis, (d) a cushion of revolution circumsurrounding and supporting the transducer within the body in a manner which substantially isolates the sound transducer from spurious noise events, and (e) an anatomy-adhereable acoustic membrane, disposed in the path for sound collection to act as a mechanical anatomy-to sensor impedance-matching coupler assisting in sound-signal collection.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/40029

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61B 5/04
 US CL : 600/509

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)
 U.S. : 600/509, 528; 381/67; 181/131, 137

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,960,089 A (Bouricius et al.) 28 September 1999 (28.09.1999), Figs. 1-6 and 8, column 7, lines 29-31.	1-4, 6, 7, 12, 13, 14, 15
Y	US 5,025,809 A (Johnson et al.) 25 June 1991 (25.06.1991), Fig. 1; column 6, lines 32-35.	1
A	US 5,010,890 A (Pfohl et al.) 30 April 1991 (30.04.1991), Fig. 4.	2, 3, 6
Y	US 4,840,183 A (Takahashi et al.) 20 June 1989 (20.06.1989), Figs. 3, 4A, 7 and 12; column 4, lines 49-54.	2, 5, 8, 9, 12, 13

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 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 another 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
- "&" document member of the same patent family

Date of the actual completion of the international search

01 September 2005 (01.09.2005)

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Name and mailing address of the ISA/US

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 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450

Authorized officer

Angela Sykes

Telephone No. 703-308-1108

Facsimile No. (703) 305-3230

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/40029

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.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
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:

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:
Please See Continuation Sheet

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 additional fees, this Authority did not invite payment of any additional fees.
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

International application No.

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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

Group I, claim(s) 1-12, drawn to a sensor system with a cushion of revolution and electrical electrode.

Group II, claim(s) 13-15, drawn to a sensor system with an anatomy adhesive layer.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I claims is the claimed electrical electrode structure and cushion of revolution that are not present in Group II. The special technical feature of the Group II claims is the claimed anatomy adhesive layer is not present in Group I. Therefore, unity of invention is lacking.