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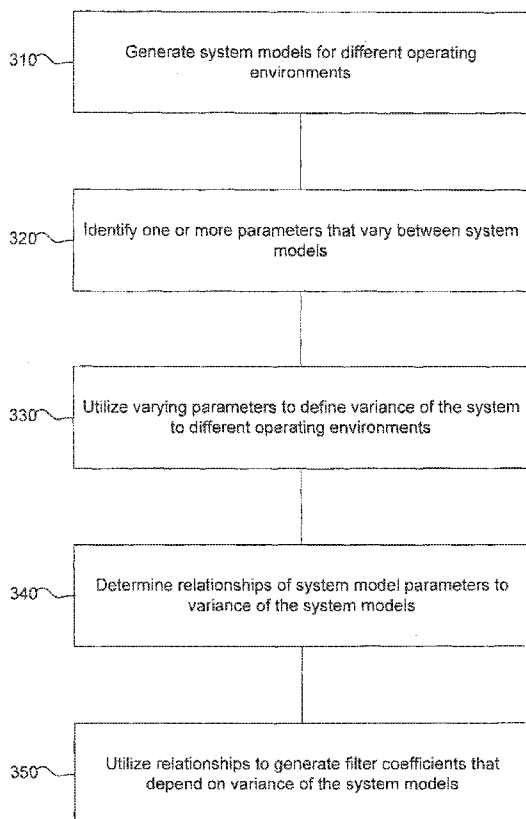
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[Continued on next page]

(54) Title: ADAPTIVE CANCELLATION SYSTEM FOR IMPLANTABLE HEARING INSTRUMENTS



(57) Abstract: The invention is directed to an adaptive system for use in removing undesired signals from an implanted microphone output signal. Initially, a plurality of system models that define relationships of corresponding output signals of the implantable microphone and a motion sensor are generated (310) to identify (320) at least one parameter that varies between different system models. This varying parameter(s) may be utilized (330) to define the variance of the system to different operating environments. A relationship may be determined (340) between the models based on the variance. This relationship may be utilized to generate filter coefficients (350) for use in a system model that varies with changes in the operating environment of the implanted microphone. Such a variable model may account for dynamic changes in the thickness of tissue overlying the implanted microphone.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2007/085787****A. CLASSIFICATION OF SUBJECT MATTER****H03G 5/00(2006.01)i, H04R 25/00(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 : H04R, H03G

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)

PAJ, FPD, USPAT, eKIPASS, IEEE, YAHOO, GOOGLE, Keyword: "hearing aid, motion sensor, operation condition"

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006076531 A2 (OTOLOGICS, LLC) 20 July 2006 (See Abstract, Figs. 4-6, 11-13, pages 2-10, 17-21, 27-34)	1-30
A	WO 2006037156 A1 (HEAR WORKS PTY LTD) 13 April 2006 (See Abstract, Fig.1, pages 3-6,8-10)	1-30
A	US 6807445 B2(Joachim W. Baumann et al) 19 October 2004 (See Abstract, Figs. 1-3, columns 3-9)	1-30
A	US 6330339 B1 (ISHIGE RYUICHI et al) 11 December 2001 (See Abstract, Figs. 2-7, columns 2-5)	1-30

 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 but 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 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

03 JUNE 2008 (03.06.2008)

Date of mailing of the international search report

**03 JUNE 2008 (03.06.2008)**

Name and mailing address of the ISA/KR

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**INTERNATIONAL SEARCH REPORT**

International application No.

**PCT/US2007/085787**

**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.: 31  
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:  
  
See Extra sheet
  
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:

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 an additional fee, this Authority did not invite payment of any additional fee.
  
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.

**PCT/US2007/085787**

The claim 31 is too unclear to make meaningful search possible. The reasons are following:  
The description of "motion sensor" and "first adaptive filter" appear in 3rd , 4th and last 2 paragraphs of claim 31, respectively. However, the functions of "motion sensor" and "first adaptive filter" differ between first and last appearance. Therefore, it cannot be determined whether those components are identical or different.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2007/085787**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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