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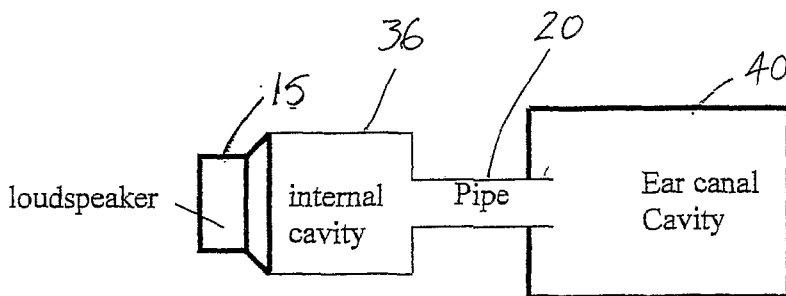
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: NOISE CANCELLATION EARPHONE



(57) Abstract: An active noise cancellation earphone (1) has an acoustic path including a cavity (36) and a pipe (20) leading to the auditory canal (40) which are arranged to form an oscillator in use which has the effect of recovering the open loop system phase characteristics at a selected frequency or frequency range. The earphone (1) also has two parts (5,18) which can be adjusted relative to each other to allow the earphone (1) to be comfortably and correctly positioned in use.



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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB2006/003179

## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

**H04R 1/10** (2006.01)      **H04R 1/28** (2006.01)

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)

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)

QWeb, Esp@ceNet and Keywords used: earphone, pipe, resonance, frequency and related words

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,333,622 A (CASALI et al.) 2 August 1994 col. 4 line 46 – col.5 line 25, col. 8 lines 3 – 10	13 – 19
X	WO 2002/084982 A2 (INNOTALENT HOLDINGS LTD.) 24 October 2002 Abstract, pages 4 and 5, Figure 2	13 – 19
X	US 4,311,206 A (JOHNSON) 19 January 1982 Abstract, col. 1 lines 41 – 48, col. 2 lines 19 – 25, col. 3 lines 1 – 15, col.3 line 39 – col. 4 line 29	13 – 19

 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

"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

"E" earlier application or patent but published on or after the international filing date

"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

"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)

"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

"O" document referring to an oral disclosure, use, exhibition or other means

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

"P" document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search

27 April 2007

Date of mailing of the international search report

02 MAY 2007

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**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:

1. Claims 1 – 12 and 20 relate to an earphone for an active noise reduction system
2. Claims 13 – 19 relate to an earphone of a particular construction

See Supplemental Box for further reasoning.

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 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.: **13 – 19**  
An earphone having a housing, the housing including an acoustic outlet and at least part of the housing adjacent to the acoustic outlet being adapted to be received in an ear canal, a speaker driver provided in the housing, an acoustic path from the driver through a pipe to the acoustic outlet, and wherein the construction is such that a resonance occurs at a predetermined frequency or over a predetermined frequency range.

**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.

**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: III**

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Search Authority has found that there are two inventions as follows:

1. Claims 1 to 12 and 20 relate to an earphone for an active noise reduction system with an earphone having an auricle portion adapted to be received in a human ear, further having a speaker and a microphone provided anteriorly of said speaker, a canal portion adapted to be received in the auditory canal of the ear, which is further rotatably mounted relative to said auricle portion such that the canal portion can be angularly adjusted relative to the auricle portion depending on ear geometry of a user. It is considered that the canal portion adapted to be received in the auditory canal of the ear, which is further rotatably mounted relative to said auricle portion such that the canal portion can be angularly adjusted relative to the auricle portion depending on ear geometry of a user comprises a first special technical feature.
2. Claims 13 to 19 relate to an earphone having a housing that includes an acoustic outlet and at least part of the housing adjacent to the acoustic outlet being adapted to be received in an ear canal, a speaker driver provided in the housing, an acoustic path from the driver through a pipe to the acoustic outlet, and wherein the construction is such that resonance occurs at a predetermined frequency or over some frequency range. It is considered that the earphone having a construction such that resonance occurs at a particular frequency or over a particular frequency range constitutes a second special technical feature.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

Each of the abovementioned groups of claims has a different special technical feature and they do not share any feature which could satisfy the requirement for being a special technical feature. Because there is no common special technical feature it follows that there is no technical relationship between the identified inventions. Therefore, the claims do not satisfy the requirement of unity of invention *a priori*.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/IB2006/003179**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
US	5333622	US	5131411		
WO	2002084982	GB	2375000	GB	2376832
US	4311206				

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX