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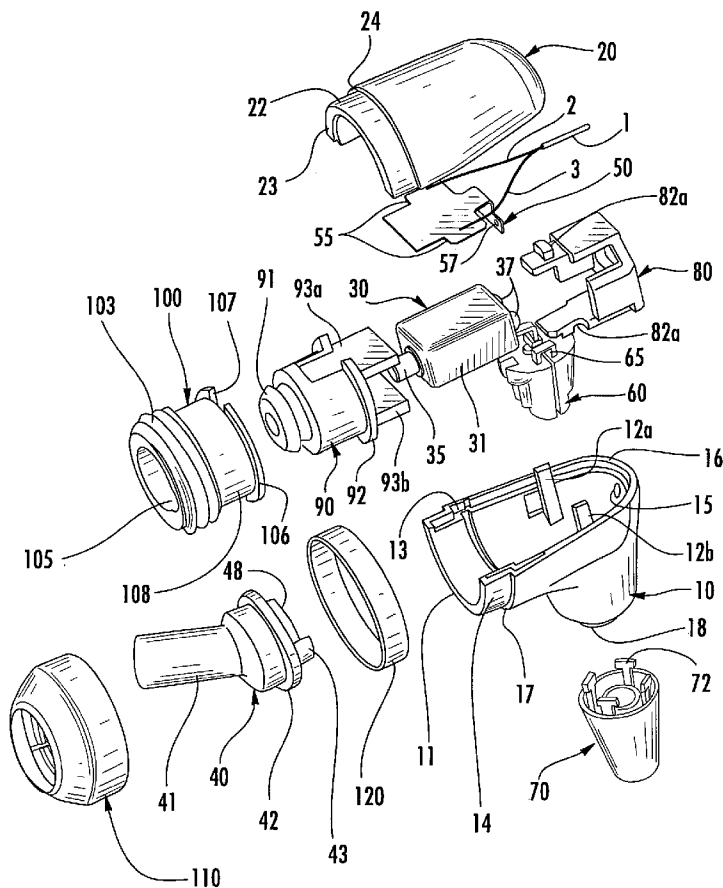
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- (71) Applicant (for all designated States except US): SHURE
ACQUISITION HOLDINGS, INC. [US/US]; 5800 West
Touhy Avenue, Niles, IL 60714-4608 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): SABICK, Gary,

- Lester [US/US]; 404 Clearbrook Court, Schaumburg, IL 60193 (US). SNYDER, Scott, A. [US/US]; 5919 N. Manton Avenue, Chicago, IL 60646 (US).
- (74) Agent: VAN ES, J., Pieter; Banner & Witcoff, LTD., 10 S. Wacker Drive, Suite 3000, Chicago IL 60606-7402 (US).
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(54) Title: EARPHONE FOR SOUND REPRODUCTION



(57) Abstract: In an aspect of the invention, a sealed earphone is provided with a nozzle (40), the earphone configured to be positioned in a user's ear so that the nozzle extends toward the ear canal of the user. The earphone includes a driver (30) mounted within a housing (10) of the earphone, the driver including a sound port (35) acoustically sealed to the nozzle. In an embodiment, the driver may include an acoustic port that directs sound into an acoustic enclosure so as to modify the frequency response of the earphone. The earphone may include a fastener that removably mounts the nozzle to the housing so that the nozzle may be readily removed and cleaned or replaced.

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ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report*

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/40704

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: **H04R 25/00(2006.01)**
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USPC: 381/370.371,372.374.379.380.381.382
 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. : 381/370,371,372,374,379,380,381,382

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)
 East


C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,084,976 (LIN) 4 July 2000 (04.07.2000), col. 3, line 15 to col. 5, line 55.	1-5
Y	US 6,411,722 B1 (WOLF) 25 June 2002 (25.06.2002), col.2, line 46 to col. 3, line 45.	1-5
Y	US 6,009,183 (TAENZER et al.) 28 December 1999 (28.12.1999), col. 2. line 51 to col.5. line 46.	1-5

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 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	"&" 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: 14 September 2006 (14.09.2006)
 Date of mailing of international search report: 05 MAR 2007

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Suhan Ni  Telephone No. 703-305-3900
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/40704

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.: 1-5

- 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/US05/40704

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-5, drawn to a headphone having a filter mounted in the nozzle, and configured to minimize a passage of contaminants through the nozzle and into the driver.

Group II, claims 6-20, drawn to a headphone with a removable nozzle mounting mean.

Group III, claims 21-22, drawn to a headphone with a removable mounting means for selectively mount different nozzles.

The inventions listed as Groups I-III 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:

Group I is directed to a headphone having a filter mounted in the nozzle, and configured to minimize a passage of contaminants through the nozzle and into the driver.

Group II is directed to a headphone with a removable nozzle mounting mean.

Group III is drawn to a headphone with a removable mounting means for selectively mount different nozzles.