United States Patent

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[54] **HEARING AID INCLUDING MICROPHONE SUSPENDED EXTERNALLY OF COMPONENT-CONTAINING HOUSING**

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[51] **Int. Cl.**.....**H04r 25/02**

[58] **Field of Search**.....179/107, 107 E

[56] **References Cited**

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[57] **ABSTRACT**

A hearing aid includes a housing containing the electrical and electronic components and having a bracket extending externally thereof and formed with an aperture. A microphone is enclosed in a protective elastic sheathing having a projecting tubular neck communicating with the sound entry portion of the microphone. The neck extends through the aperture and has an interlocking fit therein, the neck suspending the microphone from the support bracket and constituting the sole support for the microphone.

5 Claims, 3 Drawing Figures

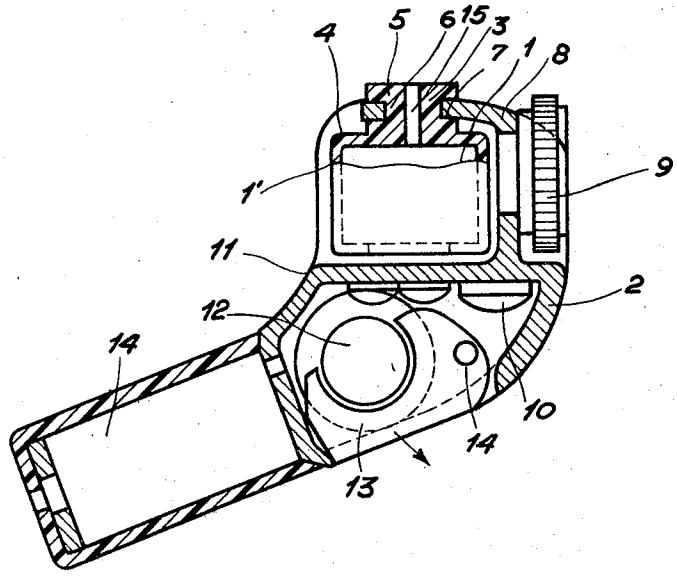


Fig. 1

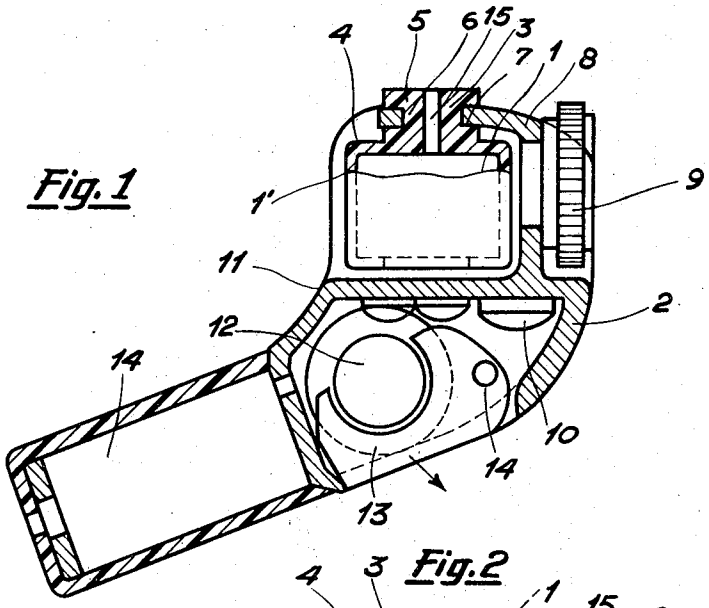


Fig. 2

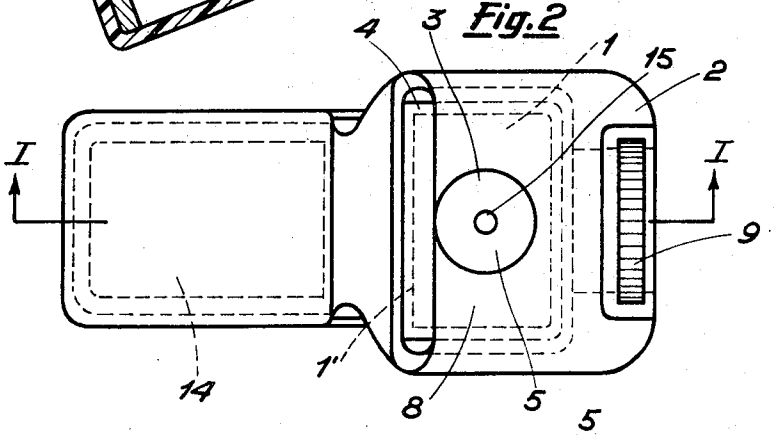
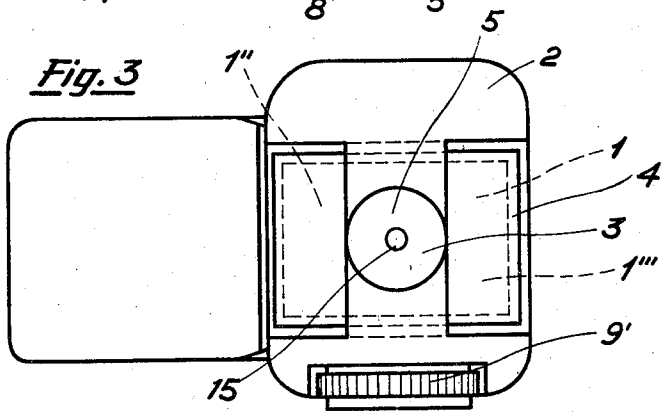


Fig. 3



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HEARING AID INCLUDING MICROPHONE SUSPENDED EXTERNALLY OF COMPONENT-CONTAINING HOUSING

This invention relates to new and useful improvements in the design of hearing aids.

More specifically, such improvements concern a hearing aid for use by deaf persons, which fits into the ear of the user, the amplifier fitting into the ear canal.

Further, such improvements concern the design of the housing of the device in order to achieve its perfect working through a suitable assembly of the microphone to avoid resonance effects, likewise mechanical and electrical couplings with the amplifier at the opposite end of the said housing, but still at a very short distance owing to the small overall size of the device.

The invention concerns more specifically the assembly of the microphone in a semi-external position, in a floating and resilient manner with respect to the housing, this being achieved through an elastic sheath containing the microphone and coupled to the housing at one single location, preferably the location chosen for the input of sound into the microphone.

The nature of the invention will be better understood from the following description, taken in connection with the accompanying drawings, in which certain specific embodiments have been set forth for the purpose of illustration, in no way limiting the scope of the invention.

In the drawings:

FIG. 1 shows a leghtwise section of a hearing aid designed in accordance with the invention.

FIG. 2 is a top plan view of the hearing aid, and

FIG. 3 is a similar top view of another embodiment of the invention.

The main improvement of the invention comprises installing the microphone 1 in a semi-external position with respect to the housing 2, such assembly placing the microphone in a floating, resilient position with respect to the housing, through one single mounting location 3.

To facilitate this, the microphone is enclosed in a sheath 4, of a resilient material, and comprising a head 5 and an intermediate neck 6 through which the said sheath is fixed in a hole 7 in the housing, more specifically at bridge 8 under which the microphone is fitted, leaving outside its entire face 1', and having potentiometer 9 fixed on the opposite face.

The housing comprises an enclosure for the remaining components of the hearing aid, namely the microcircuit 10, the contacts 11, and the battery 12, this battery being lodged in a cartridge 13 which is fixed to the housing at point 14 in an articulated manner.

At the opposite end of the housing, the receiver is fixed.

In FIG. 3, the hearing aid illustrated shows the microphone 1 with both ends 1'' and 1''' outside, potentiometer 9' being fixed to a side of the housing.

It will be understood that the positioning of the microphone, or its resilient assembly, will always be made according to the requirements imposed by the housing design, the essential principle being that the microphone must have its faces outside the housing to avoid resonance effects (a common failure of previously known hearing aid housings, where the microphone is fully enclosed in a chamber).

Likewise, to avoid mechanical and electrical couplings between the microphone and the amplifier (particularly as the latter lacks resilient fixation to the housing), it is required that the microphone be assembled in such floating and resilient manner, preferably at a single location which may coincide with passage 15 for the input of sound, as shown in the embodiments herein illustrated. However, the means for achieving this resilient assembly may be different from those shown, provided, of course, they fulfil the purpose sought as explained.

What is claimed is:

1. In a hearing aid, a housing containing the electrical and electronic components and including an externally extending support bracket having a portion formed with an aperture; a microphone having a sound entry portion; and a protective elastic sheathing enclosing said microphone and having a projecting tubular neck communicating with the sound entry portion, said neck extending through said aperture and having an interlocking fit therein; said neck suspending said microphone from said bracket externally of said housing, and constituting the sole support for said microphone.

2. A hearing aid, as claimed in claim 2, in which said neck has an externally opening annular groove receiving the peripheral portion of said aperture.

3. A hearing aid, as claimed in claim 2, in which said housing has a wall and said support bracket includes a first wall portion extending upwardly from said wall and a second wall portion extending substantially parallel to said wall; said second wall portion being formed with said aperture; said first wall portion laterally surrounding at least two faces of said microphone.

4. A hearing aid, as claimed in claim 2, in which said housing has a wall and said support bracket has a first wall portion extending outwardly from said wall and a second wall portion extending from said first wall portion substantially parallel to said wall and formed with said aperture; said first wall portion extending in adjacent spaced relation to two opposite faces only of said microphone.

5. In a hearing aid, as claimed in claim 2, said housing having a wall and said support bracket including a first wall portion extending outwardly from said wall and a second wall portion extending from said first wall portion substantially parallel to said wall and formed with said aperture; and a gain control mounted on said first wall portion.

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