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EARPIECE

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Fig. 1

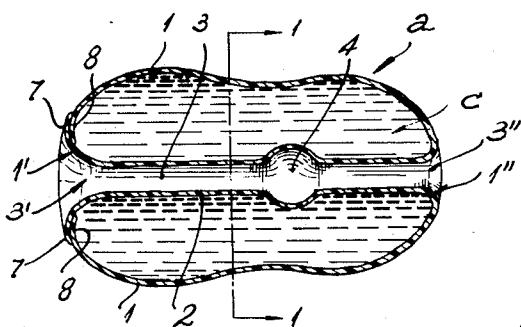


Fig. 3

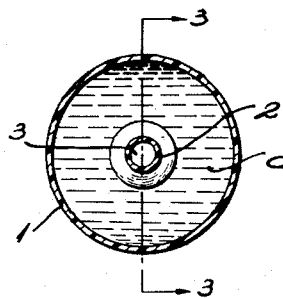


Fig. 2

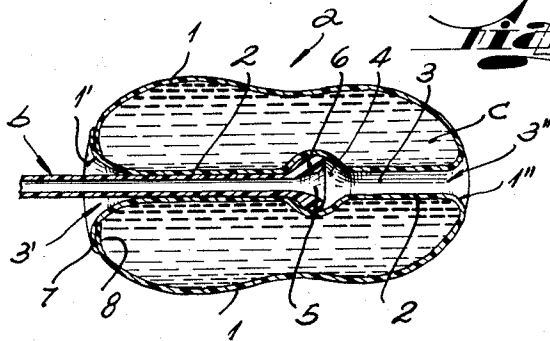
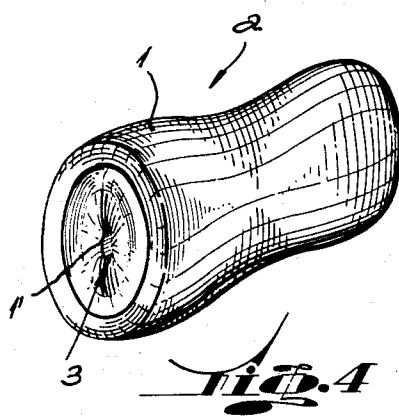


Fig. 4

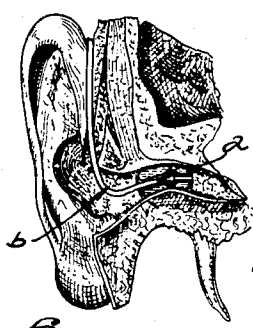


Fig. 5

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1 Claim. (Cl. 181—23)

The present invention relates to ear-prosthesis, and more particularly the invention refers to an ear-prosthesis to be used in combination with hearing-aid sets of the air-transmission type.

The generally known hearing-aid sets of the air-transmission type comprise a prosthesis consisting of a rigid member provided with means for fixing the same to the external ear and a conduit one portion of which is adapted to enter the external acoustic meatus of the ear, said conduit having connecting means to the ear-phone of the set.

Since the known prosthesis is a rigid piece it is very difficult to properly adjust the same with the external ear and the external acoustic meatus of the ear. Any difference of size and/or shape between the ear of the patient and the corresponding prosthesis results in a deficient fitting whereby a number of inconveniences and a remarkable discomfort for the patient is caused. It was also found that in the rigid prosthesis the sound is not only transmitted through the conduit of the prosthesis but also through its body. The two transmissions interfere one with another and this results in a distortion of sounds.

Furthermore it was discovered that the distortion of the sounds perceived by the patient is due to the existence of small air gaps between the body of the rigid prosthesis and the wall of the external acoustic meatus of the ear. Such distortions generally appear in the form of whistles.

Moreover, it was noted in the medical practice that in some cases it is convenient to control the extent of introduction of the prosthesis into the external acoustic meatus in order to properly define the distance between the output end of the prosthesis conduit and the tympanum web of the ear. It is very difficult to control such distance with the use of the known rigid prosthesis.

It is an object of the present invention to provide a prosthesis for the human ear in combination with the known hearing-aid sets of the air-transmission type which prosthesis is readily adjustable to the pertinent parts of the ear, thus avoiding any discomfort for the patient.

Another object of the invention is to provide a prosthesis which conducts the sound substantially only through the conduit, to avoid or at least minimize the transmission through the body of the prosthesis.

Another object of the invention is to provide a prosthesis which can be gradually introduced up to any point of the length of the external acoustic meatus so as to control the distance between the output end of the conduit and the tympanum web of the ear.

A further object of the invention is to provide a prosthesis to be used in combination with hearing-aid sets of the air-transmission type, said prosthesis comprising a sealed capsule made of yieldable walls and filled with a fluid medium, said capsule defining a conduit open at both ends.

The prosthesis of the invention comprises a capsule of

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yieldable walls, filled with a fluid medium, and having a conduit extending approximately through the central portion of the capsule, said conduit being opened at both ends. The capsule can be slightly elongated in which case the conduit extends along the center line of the capsule. The conduit is provided with means for connecting the same to a tube leading to the microphone of the hearing-aid set.

As it is evident, the structure of the capsule provides a suitable engagement of the prosthesis with the wall of the external acoustic meatus. Since the walls of the capsule are yieldable and the filling means thereof is movable, the prosthesis when introduced into the acoustic meatus actually adapts its external shape to the corresponding portion of the ear in such a way that the outer wall of the capsule intimately engages the inner wall of the portion of the acoustic meatus of the ear. The close fitting of the capsule within the acoustic meatus make it possible to maintain the correct position of the prosthesis during its use. From the appearance viewpoint it is to be noted that the prosthesis of the present invention remains hidden within the acoustic meatus and is hardly visible from outside due to the fact that there are no fixing means to the external ear.

The present invention has been illustrated by way of example in one of its embodiments in the annexed drawings, wherein:

Figure 1 is a longitudinal sectional view of the prosthesis along the line 3—3 of Fig. 3.

Figure 2 is another sectional view showing the capsule provided with the transmission tube adapted to be connected with an ear-phone not shown.

Figure 3 is a cross-section of the prosthesis along line 1—1 indicated in Fig. 1.

Figure 4 is an external view of the prosthesis.

Figure 5 is a sectional view of the external acoustic meatus of the ear having the prosthesis inserted therein.

With reference to the drawings, the prosthesis comprises a closed capsule *a* having a yieldable outer wall 1 and which in its inoperative condition has an elongated shape. The inner wall 2, having a cylindrical shape defines a conduit 3 open at both ends 3' and 3'', and extending between the ends 1' and 1'' of the capsule.

As shown in Figure 3, the inner wall 2 of conduit 3 has at an intermediate point of the length thereof an annular recess 4 which acts as connecting means for the tube *b* which leads to the conventional ear-phone generally used in the hearing-aid sets of the air-transmission type. The output end 5 of the tube *b* is provided with an annular flange 6 adjustable to the annular recess 4 of the inner wall 2. The capsule *a* which is tightly closed, contains as explained above, a fluid means *c*, which is preferably a liquid such as oil or water. It is to be pointed out that the fluid means contained within the capsule *a* must be inert to the material of the walls thereof.

The sealing of the capsule can be effected in different manners, well known in the art. In the instant embodiment the seal was achieved by sealing the overlapped portions 7 and 8 as shown in Figures 1 and 2. The walls of the capsule may be made from any suitable plastic material, such as, for example, polyethylene.

The prosthesis is applied to the ear of the patient by merely introducing the capsule into the external acoustic meatus as shown in Figure 5. The capsule can be positioned at any desired distance from the tympanum and it remains in its position due to the close engagement of the outer wall 1 with the wall of the acoustic meatus.

I claim:

A prosthesis for a hearing aid set of the air transmis-

sion type formed with a tube having a flanged output end, comprising a flexible capsule defining a closed chamber, a fluid medium in the chamber, and at least one open conduit integrally formed with the outer surfaces of the capsule and passing through the chamber, the outer surfaces and both ends of the capsule being deformable inwardly in a direction transverse to the axis of the conduit, and the conduit being formed with a recess in the middle portion thereof for connection to the flanged output end of the transmissison tube.

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