

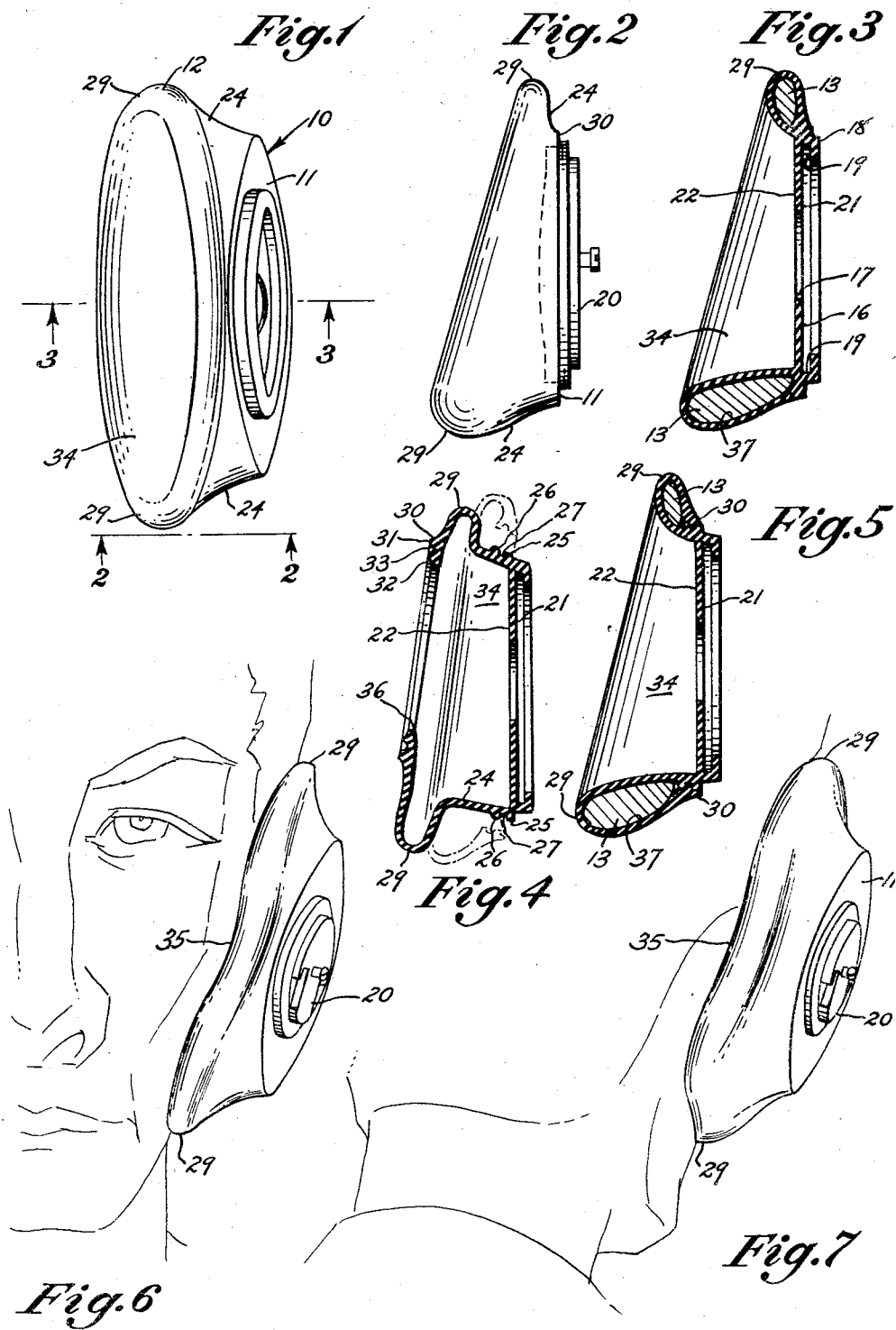
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EARPHONE BARRIER DEVICE

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1

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EARPHONE BARRIER DEVICE

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1 Claim. (Cl. 179—182)

This invention relates generally to the field of electrical-ly powered earphones, and more particularly to an improved means for supporting earphones in operative juxtaposition with respect to the ear of a user.

In special applications, as for example the intercommunication systems of aircraft, unique problems have been encountered in the supporting of the earphones upon the head of a wearer. Of primary importance is the effective sealing of the ear from a wide variety of noises created by the aircraft during flight so that an accurate signal is heard. Attempts have been made to exclude external noises by feeding the signal through an earplug. This has been reasonably effective, but unfortunately, the structure is not sanitarly particularly where the same device is used by more than one individual. It is known that such constructions spread certain types of fungus growths and is moreover rather uncomfortable to most wearers. Other devices have included a flat seal which presses against the outer ear. This causes great discomfort after prolonged wearing.

It is therefore among the principal objects of the present invention to provide an improved earphone barrier device in which the above mentioned disadvantages have been substantially eliminated.

Another object of the invention lies in the provision of an improved earphone support which provides an effective seal with regard to external noises, and which does not contact the outer ear of the user, but which instead surrounds the outer ear and lies in contact with portions of the head adjacent the ear.

A further object of the invention lies in the provision of an earphone barrier device which will be comfortable to the user over long periods of uninterrupted use.

Still another object of the invention lies in the provision of an improved barrier device construction which may be formed by a simple moulding operation of silicone rubber or similar material and which, accordingly, may be fabricated at reasonable cost.

A feature of the invention lies in the fact that only one size of device need be made for use by a large number of wearers, as no part of the external ear need be contacted. Another feature of the invention lies in the ability of the device to conform to the shape of the head of the wearer for maximum comfort.

These objects and features, as well as other incidental ends and advantages, will become more clearly apparent during the course of the following disclosure and be pointed out in the appended claim.

On the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

Fig. 1 is a view in perspective showing an embodiment of the invention.

Fig. 2 is a view in elevation of the embodiment as seen from the plane 2—2 on Fig. 1.

Fig. 3 is a horizontal sectional view as seen from the plane 3—3 on Fig. 1.

2

Fig. 4 is a horizontal sectional view, corresponding in most respects to that seen on Fig. 3, but showing a stage of assembly of the embodiment.

Fig. 5 is a similar sectional view, showing a completed stage in assembly.

Fig. 6 is a view in perspective showing the embodiment in position upon the head of the wearer.

Fig. 7 is another view in perspective showing the embodiment in position on the head of the wearer.

In accordance with the invention, the device, generally indicated by reference character 10, comprises broadly: the base element 11, a cushioning element 12, and a sound absorbing fluid 13.

The base element 11 and cushioning element 12 are preferably molded integrally from silicon rubber or synthetic resinous material having similar properties. The base element 11 includes a member 16 having a centrally disposed opening 17 therein. An angular flange member 18 extends from the outwardly disposed surface of the member 16 to form a groove 19 in which an earphone 20 may be resiliently maintained, the details of the earphone forming no part of the present disclosure. As indicated on Fig. 2, the engagement of the earphone with the groove serves to position the diaphragm of the earphone (not shown) adjacent the outer surface 21 of the planar member 16 (see Figs. 3, 4 and 5).

The cushioning element 12 extends from the base member 11, from the surface 22 thereof, and includes a spacing member 24 having first and second rib members 25 and 26 forming a groove 27 on the outer surface 28 thereof. A curved cushion member 29 is of hollow configuration, having at the free edge thereof a sealing member 30 with first and second rib portions 31 and 32 between which is disposed a groove 33. As may be seen on Fig. 5 of the drawing, the portion 31—33 correspond in dimensions to the portions 25—27, so that upon the expansion of the opening 36, the cushion member 29 may be reversed so that the component parts assume the position shown on Fig. 5 to create an effective seal. This folding creates a pocket 37 of generally angular shape which is filled with the sound absorbing fluid 13.

The sound absorbing fluid may be any suitable substance which will be deformed slowly under stress, but which will retain an imparted shape for a considerable period of time. I have preferred to use silicon putty, which behaves in the required fashion over an extended range of temperatures. Since the pocket 37 is hermetically sealed, ordinary putty is also suitable, as is moist clay and similar substances.

During assembly, the cushion member 29 is bent to the shape indicated by the dashed lines on Fig. 4 of the drawing, at which time the shock absorbing fluid is positioned within the open pocket 37 formed thereby. The seal is effected by member 30, which may be cemented or otherwise bonded.

During use, the device is positioned on the side of the head of the wearer so as to completely surround the outer ear. This will result in the cushioning member 29 being pushed directly against the side of the head, and the member 29, together with the shock absorbing fluid 13 will slowly be deformed to conform to the individual configuration of the head of the user. This forms a substantially soundproof barrier which excludes external noises, and sound passing through the sound absorbing material is confined within the pocket, since no sound passes through the fluid completely to reach the inner surface 34 of the device.

It may thus be seen that I have invented novel and highly useful improvements in earphone barrier devices which are both substantially completely effective in use, and comfortable to the wearer over relatively long periods of time. The device may be formed using techniques

already known in the rubber molding art, and may be fabricated at a reasonably low cost. By resort to a shock absorbing fluid which surrounds the seal between the device and the head of the wearer, no earplugs or other insert devices are required, whereby the device may be completely sanitary for use by a number of users.

I wish it to be understood that I do not consider the invention limited to the exact details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the present invention relates.

I claim:

An earphone barrier device, comprising: a base element having means thereon for supporting an earphone, a cushion element associated with said base element, said

cushion element including a spacing member having first and second rib members on an outer surface thereof forming a groove, a curved cushion member associated with said spacing member and having sealing means engageable with said groove to define a hollow chamber; said hollow chamber in sealed condition having sound absorbent fluid disposed therein.

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