

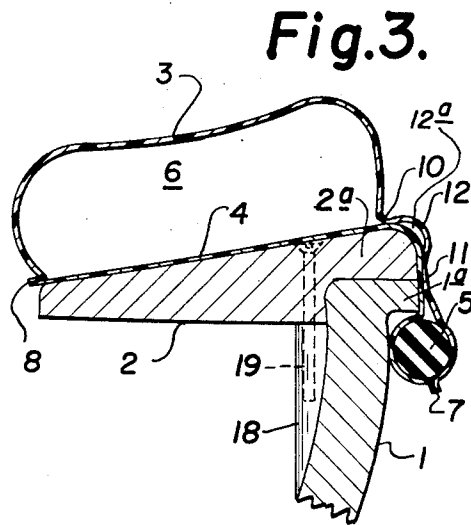
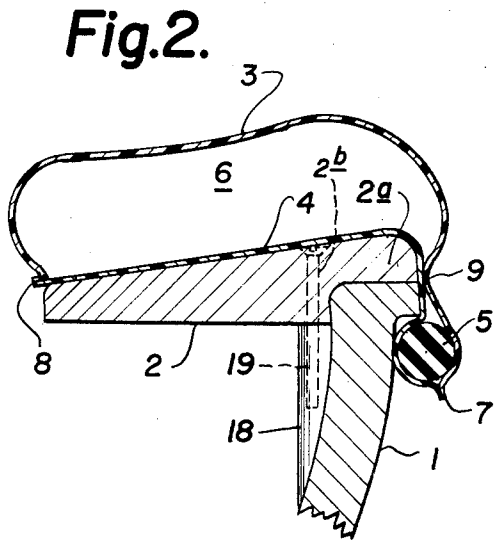
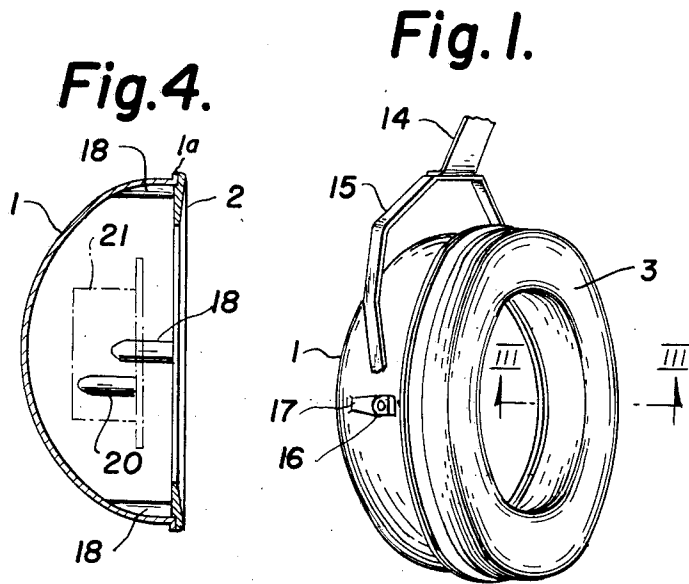
Jan. 15, 1963

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3,073,410

HEADSET

Filed Dec. 30, 1959



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3,073,410  
HEADSET

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Filed Dec. 30, 1959, Ser. No. 862,981  
2 Claims. (Cl. 181-23)

This invention relates to a headset, similar to that used by telephone, radio and all other communications operators, but with or without telephone, radio or communication receivers, or the like, contained therein and is particularly concerned with and directed to the attenuation of extraneous sounds.

In the past, attempts have been made to suppress or attenuate loud noises, such as occur in various industries, air fields and the like, by the wearing of headsets and the like. It has been found that when such headsets are provided with fluid containing cushions, particularly highly viscous liquids, optimum attenuation is obtained.

However, one outstanding disadvantage arising from the use of fluid filled cushions is the high tendency toward leakage caused by placing the headset on a hard surface, particularly one with sharp surface, corners or edges.

Another disadvantage of conventional headsets used to attenuate outside noises is the hitherto unrealized fact that the ear cups of the headset tend to vibrate, particularly at certain frequencies, such as the natural frequency of the cup, thereby increasing rather than decreasing extraneous sounds reaching the ears of the wearer.

An object of the present invention is to provide a novel headset for attenuating outside noises and which is devoid of the above named disadvantages of conventional sound suppressing headsets.

A more specific object of my invention is to provide a substantially leak-proof, fluid-containing cushion which will not tend to puncture as the result of careless or other accidental handling of the headset.

Another object of our invention is to provide a novel reinforced construction for the ear cups of the headset to minimize the vibrational tendencies, and to enable selective use thereof, either with or without earphones or the like.

Other objects and advantages will become more apparent from a study of the following description taken with the accompanying drawing wherein:

FIG. 1 is a perspective view of one of the ear cup assemblies embodying the principles of our invention showing the stirrup or pivotal yoke portion partly broken away.

FIGS. 2 and 3 are enlarged, fragmentary cross-sectional views, showing different cushion constructions and taken along line III-III of FIG. 1, which more clearly show the rib reinforcing construction of the ear cup; and,

FIG. 4 is a vertical cross-sectional view of the ear cup of FIG. 1 shown without a cushion.

Referring more particularly to FIG. 1 of the drawing, numeral 1 denotes an ear cup of either conventional or unconventional hemispherical shape or of elongated or oval shape and which is preferably made of hard plastic material, such as compression or transfer molded melamine, or injection molded material such as fiber-filled styrene, die or wrought metals or ceramics. The mouth portion of the cup is provided with a radially outwardly extending flange portion 1a, as shown more clearly in FIG. 2, FIG. 3 and FIG. 4, for supporting an annular base plate 2 having a notched out or recessed inner groove to fit closely around said flange, as shown more clearly in FIG. 2. The base plate is also preferably made of the same material as the ear cup 1.

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Base plate 2 has a slight radial flare and provides a backing support for the endless, annular tubular cushion 3 of extensible or non-extendable flexible material, preferably a plastic such as a vinyl sheet or film, rubber, neoprene, silicone or similar material.

The cushion 3 may be made of two flat or formed annular strips of plastic which are heat-sealed or electrically sealed, adhesively or mechanically affixed along their inner perimeters 8 and along their outer perimeters 7, as well as being heat-sealed or otherwise attached along the annular path 9 adjacent the outer perimeter, so as to sandwich a rubber band 5, O-ring, mechanical spring or the like, or one of any other elastic material, between path 9 and periphery 7. Cushion 3 may be made of either elastic or relatively non-elastic plastic material. Thus the rubber band 5 may be stretched so as to firmly and securely hold the liner 3 in the position shown by virtue of the anchorage of rubber band 5 against the under surface of the peripheral flange of ear cup 1.

The cushion 3 may be filled with any suitable fluid 6 such as air or a liquid, but preferably the latter, and especially highly viscous fluid, such as glycerine, grease and other fluids that will flow as the result of very slight application of force, or pressure as provided by the tension of the headband.

A disadvantage of the construction of the liner 3 shown in FIG. 2 is that a fluid-containing portion thereof projects radially outwardly of the cup, so that if the headset is carelessly thrown against a hard surface, particularly a sharp corner, by the wearer, there will be a great tendency for the projecting portion of the cushion to become punctured and for the fluid contents to evacuate.

A modified and highly improved construction of the cushion is shown in FIG. 3 which will overcome this disadvantage. It will be noted that in this construction, an additional (heat-sealed) ring 10 is provided for two reasons; one, to prevent any part of the fluid-containing cushion from projecting radially outwardly of the cup 1 and thus be vulnerable to leakage by bumping against hard surfaces and, secondly, to provide a separate bumper portion 12, partly filled with air 12, rubber, or similar material, so as to absorb the bumps caused by accidental throwing of the headset against hard surfaces. In other words, the fluid containing portion of liner 3 does not project beyond the mouth of the cup so as to absorb bumps from rough handling. If the headset is thrown so that the top surface of the cushion engages a solid surface, the force will be distributed over such a large area of the liner that no puncturing will result.

We have made the amazing discovery that one of the reasons that outside noises are not satisfactorily attenuated is that the ear-cup 1 itself has a tendency to vibrate, induced by extraneous noises or those induced by the microphones. We have overcome this tendency by providing integral ribs, such as 18, extending along the curved surface of the cup 1 adjacent its mouth portion and in a direction towards the center of the base of the cup. Four such ribs are shown, although any greater or smaller number may be used as required.

Ribs 18 have a dual function of reinforcing the ear cup 1 against vibration, as well as serving as a support or boss for receiving the threaded ends of screws 19, shown in dotted outline in FIG. 2, which screws 19 extend through registering holes 26 in base plate 2 when it is desired that the base plate be detachably attached as in the case wherein a telephone receiver or earphone 21 (see FIG. 4) is to be mounted therein. Such earphones 21 are mounted in the cups by supporting them on additional ribs 20 on opposite sides of the ear cups, at least a pair of which suffices for mounting a flanged portion of each earphone 21 thereon, such as by screws

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or other means extending through the flanged portion and the axes of the ribs 20 integrally formed on the cup and pointing toward the center of the base of the cup.

A pair of ribs 17 are also provided on opposite sides of the outside of the cup for further reinforcing the cup, also to serve as pivots for receiving the pointed inwardly projecting edges (not shown) of the stirrup 15 integrally formed on each end of headband 14 of the headset. It is understood that any type of headset may be used and that an identical ear cup assembly as shown in FIG. 1 will be mounted on the other end of the fragmentarily shown headband.

Thus it will be seen that we have provided an efficient noise attenuating headset, useful either with or without communication equipment, which headset is provided with ribs for preventing vibration of the ear cups as well as for serving as fastening means for detachably fastening the base plate; furthermore we have provided a relatively leak-proof liner for such headsets which, when filled with the fluid and tossed carelessly onto a hard surface, will not tend to puncture, thereby providing relatively long life to the cushion and headset.

While we have illustrated and described several embodiments of my invention, it will be understood that these are by way of illustration only, and that various changes and modifications may be made within the contemplation of our invention and within the scope of the following claims.

We claim:

1. A headset including a headband having at least one ear cup pivotally supported on the end thereof, an annular base plate mounted on the mouth portion of said ear cup, a tubular annular shaped cushion of flexible plastic sheet material and containing a viscous fluid, which cushion is supported on said base plate in a manner so that no portion of the cushion containing the fluid

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filling projects radially outwardly of the marginal portion of the cup, an elastic band secured to the outer peripheral portion of the cushion for mounting the cushion underneath an outwardly turned flange of the mouth portion of the cup and a bump-receiving projection intermediate said fluid-filled part of the cushion and said elastic band and which projects radially outwardly of the outer peripheral portion of the cup.

2. In an ear cup for use on a headset, an annular base plate mounted on the mouth portion of the ear cup, an endless, tubular, annular cushion of flexible material comprising two flat annular strips of plastic sheet material sealed at their inner peripheries and at their outer peripheries, and sealed also along two intermediate circular paths, a fluid contained between said inner periphery and the innermost of said intermediate circular paths, an elastic band sandwiched between said strips intermediate the other circular path and the outermost periphery, for mounting said cushion on a peripheral flange of said ear cup, the portion of said strips between said two intermediate, sealed circular paths containing air so as to provide a bumper cushion projecting radially outwardly of said base plate.

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