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EARPHONE SUPPORT AND SILENCER CUP

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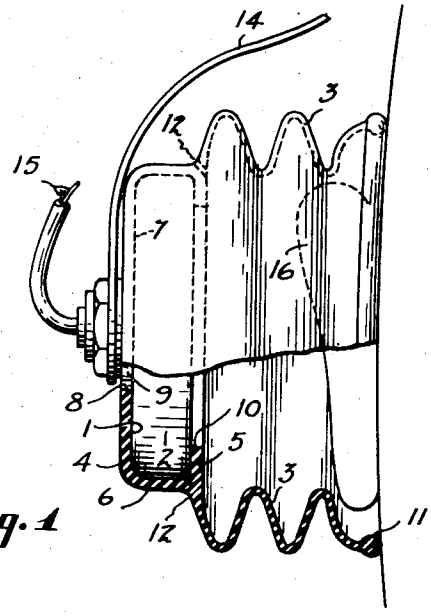


Fig. 1

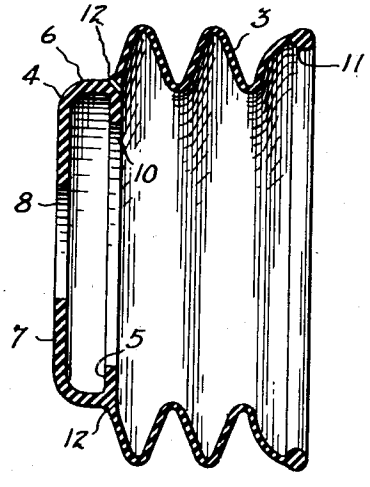


Fig. 3

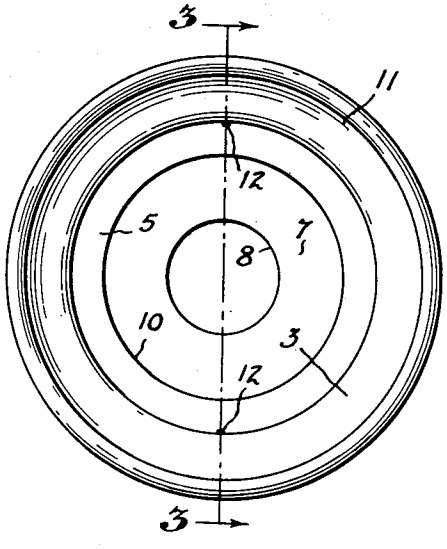


Fig. 2

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EARPHONE SUPPORT AND SILENCER CUP

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4 Claims. (Cl. 181—22)

This invention relates to an attachment to support an earphone receiver in an operative position with relation to the ear and to prevent extraneous sounds from entering the ear of the user. The device is particularly adapted for use by aviators in preventing noises due to engine noises, shell explosions and the like from interfering with the operation of the receiver.

It is an object of the present invention to provide an earphone support and silencer cup wherein all the pressure is carried against the head of the wearer instead of against portions of his ear.

It is another object of the present invention to provide an earphone support and silencer which permits various positioning and angular adjustments of the phone to any shaped head, but which at the same time provides uniform pressure over all points of contact with the head of the wearer.

It is another object of the present invention to provide an earphone support which permits complete encirclement of the ear and provides a dead air space between the headphone and the ear, thus preventing any pressure of the cup from bearing directly on any part of the ear.

It is a further object of the present invention to provide an ear phone support and silencer, wherein the pressure of the air within the support is maintained equal to the external pressure without allowing sound from external sources to penetrate the interior of the cup.

It is a still further object of the present invention to provide an earphone support and silencer cup wherein the headphone is securely held in position and prevented from contacting the ear of the user.

Other objects will be apparent from the following description of the invention, as illustrated by the accompanying drawing, in which:

Figure 1 is an elevational view, with parts broken away, of an earphone support and silencer cup embodying the present invention and showing the cup in postion over an ear of a wearer and with a headphone in place;

Fig. 2 is an end elevational view of an earphone support and silencer cup in its molded form; and

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2.

Referring more particularly to the drawing, in which like parts are indicated by like numerals of reference throughout the several views, the device of the present invention comprises a cavity 1 to receive portions of a suitable earphone receiver 2 and a cylindrical bellows portion 3 integral with the phone receiving cavity. The phone receiving cavity 1 has an outer annular cover portion 4 adapted to envelop a portion of the receiver and an inner annular flange portion 5 adjacent one end of the cylindrical bellows portion 3 and separating said bellows portion from said cavity. The cover portion 4 of the cavity preferably has a substantially cylindrical wall 6 and an inwardly extending, annular outer flange 7 which has an opening 8 substantially centrally of the cover portion. The inner annular flange 5 has an inner opening 10 substantially larger in diameter than that of the outer opening 8 in the cover portion 4, but of a smaller diameter than the diameter of the earphone receiver.

The inner flange 5 serves to retain the body of the earphone within the cavity 1. The opening 8 is preferably of substantially smaller diameter than the outer portion 9 of the headphone 2, so that in operation or in the positioning of the earphones, the inwardly extending flange 7 or cover as a whole is stretched tightly about the body of the receiver. An air-tight juncture is thereby formed with the body of the receiver and full advantage of the rubber in absorbing energy from the body of the phone may be had and a relatively lower sound level maintained.

The cylindrical bellows portion 3 is of sufficiently large diameter to completely enclose the average human ear and preferably terminates at its free end in an annular sealing rim 11, which is adapted to contact the head of the wearer. The cylindrical bellows portion is sufficiently long so that it prevents contact between the earphone or the inner annular flange 5 and portions of the ear of the wearer. A free air space is thus provided entirely around the ear of the wearer so as to aid in materially increasing his comfort.

Means, such as one or more relatively small openings 12 through the outer wall of the cylindrical bellows portion, is provided to permit equalization of the air inside and outside of the bellows portion, so as to maintain the air within the bellows at the pressure of the surrounding atmosphere when the receiver and ear cup are in place on the wearer. The openings 12 are preferably adjacent the inner flange 5 and extend at an angle thereto through the cylindrical bellows portion of the ear cup. The openings should be of relatively small size, such as less than one-sixteenth inch, to prevent sound transmission within the cylindrical bellows portion.

In the utilization of the device of the present invention, the receivers 2 of the headphones, which receivers are suitably connected by the spring strap 14 and receive signals through suitable conductors 15, are disposed so that the body portion is within the cavity 1 with the outer wall 7 stretched relatively tightly thereover.

The cylindrical bellows portion 3, being of sufficient diameter and length to permit the ear to be retained freely therein, prevents pressure from being applied to the ear 16 of the wearer. It therefore appreciably decreases fatigue and permits the formation of a superior seal against any shaped head. The bellows is found to be especially useful as it permits angular adjustment of the sealing edge of the bellows portion to the head without concentration of pressure from the spring 14.

It will be also seen that with the bellows type of construction set forth above, the earphone supports and silencers of the present invention are very light in weight and permit complete freedom of the wearer because of the large area of contact between the free edge of the cup and the head of the wearer.

It is to be understood that variations and modifications of the specific device herein shown and described for purposes of illustration may be made without departing from the spirit of the invention.

What I claim is:

1. An earphone support and silencer cup of flexible, rubberlike material comprising a cavity portion to receive an earphone, an integral, cylindrical bellows portion, and means for maintaining the air within the bellows portion substantially at the pressure of the surrounding atmosphere, said cavity portion having an outer annular cover portion adapted to envelop a portion of the receiver and an inner annular flange portion adjacent said bellows portion and separating said cavity portion from said bellows portion, an outer substantially central opening in said cover portion, an inner opening through said flange between said cavity portion and said bellows portion, said bellows portion having a flexible, cylindrical bellows of sufficient diameter to cover the ear, a free end of said bellows portion terminating in an annular sealing edge adapted to contact the head of the wearer and the other end of said bellows portion terminating adjacent said inner annular flange, whereby by compression of said bellows said earphone and said flange may bear against the ear of the wearer.

2. An earphone support and silencer cup of flexible rubberlike material comprising a cavity portion to receive an earphone, an integral, cylindrical bellows portion, said cavity portion having an outer annular cover portion adapted to envelop a portion of the receiver and an inner annular flange portion adjacent said bellows portion and separating said cavity portion from said bellows portion, an outer substantially central opening in said cover portion, an inner opening through said flange between said cavity portion and said bellows portion, said outer opening being of relatively small diameter to permit said cover portion to envelop substantially the entire body of said receiver, said inner opening through said annular flange being of relatively larger diameter than said outer opening to permit substantially unrestricted air movement between said bellows portion and said cavity portion, said bellows portion having a flexible, cylindrical bellows of sufficient diameter to cover the ear, a free end of said bellows portion terminating in an annular sealing edge adapted to contact the head of the wearer and the other end of said bellows portion terminating adjacent said inner annular flange, whereby by compression of said bellows said earphone and said flange may bear against the ear of the wearer.

3. An earphone support and silencer cup for spring connected head at headphones comprising a cavity portion to receive and substantially enclose an entire earphone, an integral and substantially cylindrical bellows portion, and means for maintaining air within the bellows portion substantially at the pressure of the surrounding atmosphere, said cavity portion having an outer annular cover portion adapted to substantially entirely envelop an earphone receiver, an inner annular flange portion adjacent said bellows portion and separating said cavity portion from said bellows portion, an outer substantially central opening in said cover portion, an inner opening through said flange between said cavity portion and said bellows portion, said bellows portion having a flexible cylindrical bellows of sufficient diameter to cover the ear, the free end of said bellows portion terminating in an annular sealing edge adapted to contact the head of the wearer, the other end of said bellows portion terminating adjacent said inner annular flange, whereby by compression of said bellows said earphone and said flange may bear against the ears of the wearer and the pressure due to the spring of said headset may be distributed over the ears of the wearer as well as over his head portion in contact with said annular sealing edge.

4. An earphone support and silencer cup for spring connected head at headphones comprising a cavity portion to receive and substantially enclose an entire earphone, an integral and substantially cylindrical bellows portion, and means for maintaining air within the bellows portion substantially at the pressure of the surrounding atmosphere, said cavity portion having an outer annular cover portion adapted to substantially entirely envelop an earphone receiver, an inner annular flange portion adjacent said bellows portion and separating said cavity portion from said bellows portion, an outer substantially central opening in said cover portion, an inner opening through said flange between said cavity portion and said bellows portion, said bellows portion having a flexible cylindrical bellows of sufficient diameter to cover the ear, the free end of said bellows portion terminating in an annular sealing edge adapted to contact the head of the wearer, the other end of said bellows portion terminating adjacent said inner annular flange, whereby by compression of said bellows said earphone and said flange may bear against the ears of the wearer and the pressure due to the spring of said headset may be distributed over the ears of the wearer as well as over his head portion in contact with said annular sealing edge, said inner opening being larger in diameter than said outer opening whereby the damping of extraneous vibrations in the case of said earphone enclosed in said cavity may be accomplished and substantially unrestricted air movement may be had between said bellows portion and the diaphragm of an earphone enclosed in said cavity portion.

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