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ATTACHMENT MOUNTING MEANS FOR HEARING PROTECTOR EARCUPS

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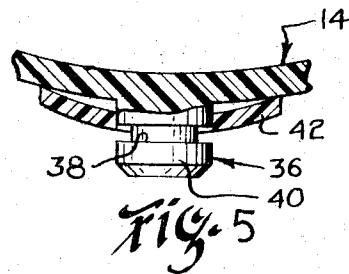
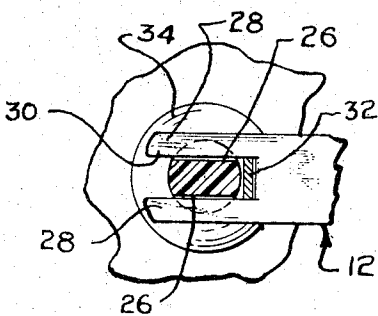
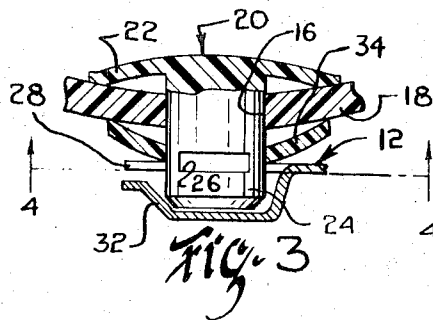
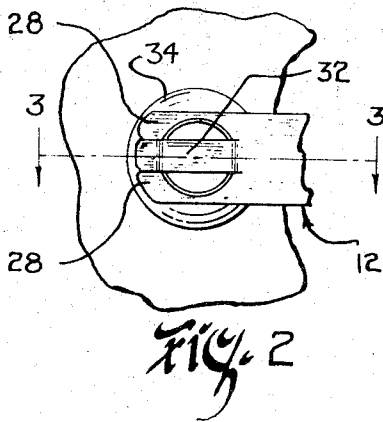
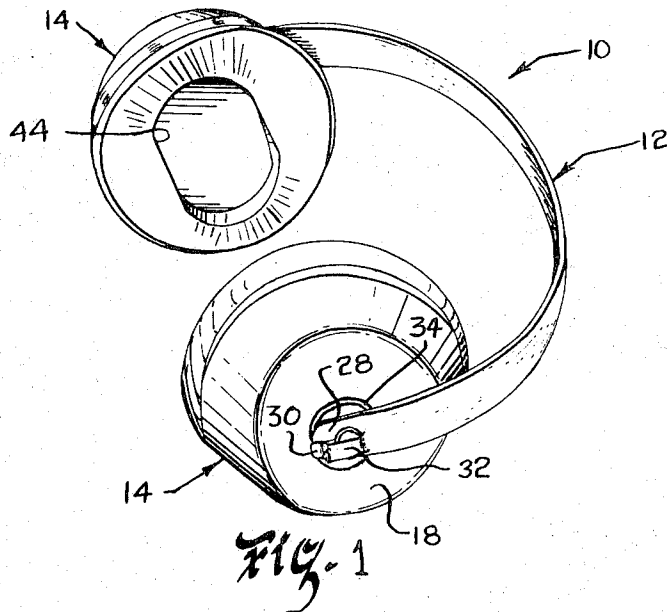


Fig. 4

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1

2

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5 Claims

ABSTRACT OF THE DISCLOSURE

Hearing protector earcup supporting means including a headband having attachment means at each of its opposite ends for receiving and supporting an earcup. The attachment means in each case comprises a fork having two planar prongs between which a recessed end of an earcup mounting stud is fitted with an intermediate third prong of the fork extending over and latched to the end of the stud. The stud is either formed as an integral extension of the wall of its respective earcup or extended through the earcup wall in coaxially aligned relationship with the cup so as to permit rotation of the cup about its axis relative to the headband.

BACKGROUND OF THE INVENTION

Field of the invention

Hearing protectors with particular reference to headband supported earcups.

Description of the prior art

Headband supported hearing protector earcups are currently being provided with elongated elliptically or generally triangularly shaped openings through which the ear auricle is inserted into the cup for providing a seal closely around the ear canal against the wearer's head. Accordingly, in properly fitting such earcups to the head, a rotational adjustment of each relative to its supporting headband is required to accommodate for variations in head shapes, sizes and relative positions of ears upon the head.

While prior art earcup attachment mounting devices have, in some cases, permitted rotational adjustment of earcups relative to their supporting headbands, these devices in general have been found to be of relative complexity, ungainly and costly construction, contributory to excessive weight upon the head of a wearer and commonly restrictive to the selection of positions relative the head around which the headband may be extended.

The present invention overcomes the aforementioned drawbacks to prior art headband supported hearing protector earcup devices by providing novel, lightweight, simple and inexpensive earcup attachment mounting means offering a full 360° rotational adjustment of the earcups relative to their supporting headband whereby wearing of the headband behind the head, over the head or beneath the chin is given to the discretion of the wearer along with complete freedom to reposition his headband at any time without removal of the earcups from his ears.

SUMMARY OF THE INVENTION

In its relationship to improvements in attachment mounting means for earcups, the present invention accomplishes the aforementioned objectives and others which may become apparent hereinafter by providing at each of opposite ends of a hearing protector headband a three-pronged fork. Two prongs of the fork are in spaced parallel planar relationship with each other so as to receive therebetween one end of an earcup mounting stud with the third prong extending over and latched to the terminus

of the stud. A circumferential groove or pair of diametrically opposed parallel slots adjacent the terminus of the stud receives the pair of prongs while the third prong, under spring tension, snaps over the terminal end of the stud when the assembly of stud and headband is made.

The mounting stud, either as an integrally molded extension of the earcup or a separable element inserted through an opening in the earcup wall, is aligned coaxially with the cup. In the former case wherein the stud comprises a molded extension of the earcup, it is provided with a circumferential groove adjacent its terminus into which the pair of planar prongs are inserted whereby a full 360° axial rotation of the cup and stud in the bifurcation between said pair of prongs relative to the headband proper, or vice versa, is permitted. In the latter case wherein the stud extends through an opening in the wall of the earcup, rotation of the earcup about the stud itself is permitted whereby an attachment of the headband to the stud may be effected by providing a pair of diametrically opposed parallel slots adjacent the terminal end of the stud into which the pair of planar prongs of the headband are inserted.

The invention will be more fully understood by reference to the following detailed description and the accompanying drawing.

DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective illustration of one embodiment of the invention;

FIG. 2 is a fragmentary elevational view of the embodiment of hearing protector earcup-headband attachment mounting means illustrated in FIG. 1;

FIG. 3 is a cross-sectional view taken generally along line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view of the attachment mounting means taken along line 4—4 of FIG. 3; and

FIG. 5 is a fragmentary partially cross-sectioned view of a modification of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hearing protector headpiece 10 (FIG. 1) comprises headband 12 having an ear protector cup 14 pivotally connected to each of its opposite ends.

Each earcup 14 is provided with an axially disposed opening 16 extending through its rearward side 18 (FIG. 3) through which a mounting stud 20 is extended. Stud 20, preferably being formed of nylon or a similar material, has an enlarged somewhat flexible head 22 which peripherally engages the inner surface of side 18 around opening 16. The opposite terminal end 24 of stud 20 is provided with a pair of parallel diametrically opposed slots 26 (FIGS. 3 and 4) into which one end of headband 12 is inserted.

Headband 12, being formed of a relatively thin strip of spring steel or the like, has a three-pronged fork formed at each of its opposite ends. Two prongs 28 of the fork are planar with a bifurcation 30 therebetween (see FIG. 4) resulting from a third prong 32, formed of the material initially in the space between prongs 28, being bent outwardly away from prongs 28 in the manner best illustrated in FIG. 3.

In the assembly of headband 12 and earcup 14, prongs 28 of the forked end of headband 12 are inserted into slots 26 of stud 20 thereby forcing prong 32 to snap over end 24 of stud 20, locking the headband to earcup 14 when stud 20 is fully entered into bifurcation 30. Friction washer 34 placed between prongs 28 and side 18 of cup 14, in conjunction with head 22 of stud 20, forms an acoustical seal around opening 16 and frictionally holds earcup 14 in desired rotational positions of alignment relative to headband 12, or vice versa. In

3

this embodiment of the invention it can be seen that earcup 14 is rotatable about stud 20 between head 22 thereof and friction washer 34.

In a modification of the invention stud 20 may be molded as an integral extension 36 (FIG. 5) of cup 14. In such a case, a circumferential groove 38 is provided in extension 36 adjacent its terminal end 30 into which prongs 28 of a forked end of headband 12 are inserted. Thus, with the terminal end 40 of extension 36 fully entered into bifurcation 30 and latched by prong 32 of headband 12, rotation of earcup 14 relative to headband 12 will take place about groove 38 in the bifurcation 30 between prongs 28. Friction washer 42 on extension 36 holds cup 14 under slight tension against prongs 28 whereby cup 14 is frictionally held in desired positions of rotational adjustment relative to headband 12 and vice versa.

It is to be understood that with either of the above described embodiments of the invention, headband 12 may be worn behind the head, over the head or under the chin at the wearer's discretion. At any one of these positions and others intermediately thereof, earcups 14 may be rotatably adjusted independently of each other relative to headband 12 so as to orient the elongated opening 44 in each cup 14 as required for proper fitting about the ear.

It is also pointed out that the outwardly directed convex surfaces of friction washers 34 and 42 permit a tilting of cup 14 relative to headband 12 along all radial dimensions of the cup within limits imposed by the difference between the thickness of prongs 28 and the widths of slots 26 or groove 38 respectively. Accordingly, slots 26 and groove 38 are preferably formed to a width dimension substantially greater than the thickness of prongs 28. Thus, along with the rotation of cups 14 relative to headband 12, their ability to tilt relative to the headband facilitates comfortable fitting and the achievement of optimum acoustical sealing of the cups around the ears.

I claim:

1. In a hearing protector headset including a headband and at least one ear protector cup having a head-engaging inner side with an ear-receiving opening therein and a headband attaching outer side; the improvement in attachment mounting means for supporting said cup upon one end of said headband comprising:

a mounting stud upon said outer side of said cup extending coaxially outwardly therefrom and including recessing formed adjacent its terminal end for receiving attachment means on said end of said headband;

4

said attachment means including the formation of a fork adjacent said end of said headband, said fork having two planar prongs inserted into said recessing in said stud and a third prong extended over and latched to said terminal end of said stud; and

said attachment means further including a friction washer on said stud disposed between said outer side of said cup and said pair of planar prongs for frictionally retaining said cup and said headband in desired positions of relative rotational adjustment.

2. A hearing protector headset according to claim 1 wherein said mounting stud extends through said outer side of said cup whereby said cup is rotatable about said stud and said recessing adjacent said terminal end of said stud comprises a pair of diametrically opposed parallel slots into which said planar prongs of said fork are inserted.

3. A hearing protector headset according to claim 1 wherein said stud comprises an integral extension of said outer side of said ear protector cup and said recessing adjacent said terminal end thereof comprises a circumferential groove into which said planar prongs of said fork are inserted whereby rotation of said cup and stud as a unit takes place between said pair of planar prongs.

4. A hearing protector headset according to claim 2 wherein said friction washer has a spherically convex side disposed against said planar prongs and said slots in said stud are of a width dimension substantially greater than the thickness dimension of said planar prongs.

5. A hearing protector headset according to claim 3 wherein said friction washer has a spherically convex side disposed against said planar prongs and said circumferential groove is of a width dimension substantially greater than the thickness dimension of said planar prongs.

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