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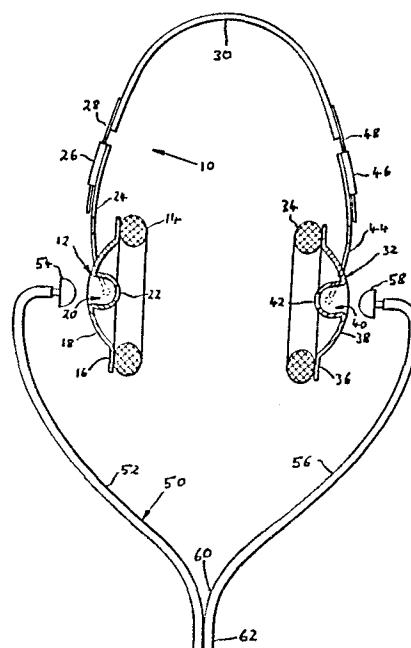
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(54) **Earphone adaptors.**

(57) An earphone adaptor 10 for plug type earphones 50 comprises two mutually opposed ear cups 12, 32 connected together via a headband 30. The ear cups 12, 32 have annular pads 14, 34 attached to discs 16, 36, each disc having a raised central portion 18, 38 and a cavity 20, 40 in the raised portion 18, 38 adapted to receive an earplug 54, 58 of the plug type earphone 50. The ear cups 12, 32 are adjustable with respect to the headband 30 so that they can fit over a user's ears (not shown) enclosing the ears in the annular pad 14, 34 and isolating the user from any external noise source.



EARPHONE ADAPTORS

This invention concerns earphone adaptors, particularly for plug type earphones having earpieces shaped to permit insertion into the auditory openings of human ears.

Plug type earphones generally comprise two flexible tubes
5 joined together in an adjustable calliper frame, the free ends of the tubes having ear plugs adapted to allow their insertion into the auditory openings of human ears. A tail formed by the joining together of part of the two tubes and running parallel from the calliper frame has a connector at its free end so that the
10 earphones can be connected to a sound source. The ear plugs on such earphones are commonly an extension of the tubes and are substantially mushroom shaped with a hollow stem generally of plastics or other similar material, connected with its respective flexible tube to the stem of the "mushroom" and having an aperture
15 on the hemisphere's curved surface opposite the tube connection. Sound can travel along the tube from the connector and then into the two tubes forming the arms of the Y-shape through the ear

plugs and then into the ears of the user.

Earphones of this type are common on long distance aeroplanes where they are used to allow the passengers to listen to various forms of in-flight entertainment. However, such earphones, although
5 cheap and simple to manufacture, can become uncomfortable if used for long periods of time and do not totally isolate the user from other sounds.

An object of the present invention is to provide an earphone adaptor for earphones of the plug type which allows said earphones
10 to be used for long periods of time without discomfort and serve to reduce background noise to the user.

With this object in view the present invention provides an earphone adaptor for earphones of the plug type comprising two ear cups joined together by adjustable connecting means so that the cups
15 are disposed in mutual opposition, each ear cup comprising an annular deformable ear pad and a connecting plate adapted to receive and retain an ear plug of a plug-type earphone and to allow sound to pass from the earplug to respective ears of the earphone adaptors user.

20 Preferably the connecting plate has a raised centre section, this raised portion having a cavity adapted to accommodate an ear plug, the plate being of a resilient material such that the cavity will retain the ear plug within it.

Advantageously the annular pads are of plastics, foam or foam plastics.

Preferably the connecting means is a U-shaped strip of flexible material, the ear cups being attached at respective free ends of the strip and being adapted so that they are slideably displaceable along the strip to ensure a good fit on the user.

Advantageously the ear cups are provided with respective stoppers adapted to be received and retained by the connecting plate in place of respective ear plugs of a plug type earphone. These stoppers allow the adaptor to be used as a sound moderator to isolate the user from extraneous noises.

The invention will be described further by way of example, with reference to the accompanying drawing, in which the single figure is a part sectional view illustrating a preferred embodiment of the earphone adaptors of the invention and a plug type earphone.

The illustrated practical embodiment of the earphone adaptor, referred to generally by the reference numeral 10, comprises a pair of ear cups 12, 32. Each cup 12, 32 has respective annular pads 14, 34 attached to connecting plates 16, 36. The connecting discs 16, 18 have a raised central portion 18, 38 forming a dome like configuration over the annular pads 14, 34. This raised central portion 18, 38 is provided with a cavity 20, 40 which protrudes into the annular pad 14, 34. The cavity 20, 40 has an opening 22, 42 at its lowermost point to

permit sound to pass from the cavity 20, 40 into the volume enclosed by the annular ring 14, 34. A Y-shaped member 24, 44 is pivotally attached to the disc 16, 36 so that the disc 16, 36 is moveable relative to the Y-shaped member 24, 44. At the free end of the
5 Y-shaped member, 24, 44 is attached a sleeve 26, 46 which is adapted to allow a headband member 28, 48 to pass therethrough. The ear cups 12, 32 are thereby disposed to be slideably displaceable along the head band members 28, 48, which are interconnected by a flexible headband 30. The sleeves 26, 46 retain the ear cups 12, 32 in the
10 desired position by friction between the sleeves 26, 46 and their respective headband members 28, 48.

A known plug type earphone 50 comprises two flexible tubes 52, 56 joined together at a junction 60 to form a tail 62. Each tube 52, 56 has at its respective free end an earplug 54, 58 issue to a connector
15 (not shown) so that the tail 62 can be connected to a sound source (not shown).

In use the adaptor of the invention is placed on a users head (not shown) and the ear cups 12, 14 adjusted so that the annular pads 14, 34 fit around the users ears (not shown). The ear plugs 54,
20 58 of an earphone 50 are inserted in the cavities 20, 40 which deform to hold the earplugs 54, 58 in place. In this way the earphones can be used for long periods with little discomfort to the user and the annular pads 14, 34 serve to isolate the ear from any other sound source.

The invention is not confined to the precise details of the illustrated embodiment and variations may be made thereto. Thus the shapes of the ear cups 12, 14 and the cavities 20, 40 and the manner in which the ear cups 12, 14 are attached to the headband 30 may all vary from the precise details illustrated. Further the annular pads 14, 34 could be part of the connecting disc and need not be circular in shape. Stoppers could be provided which are adapted to fit in the cavities 20, 40 so that if the user wished he could remove the earphones and block off all sources of noise if for example the user wanted to sleep. The connecting plate need not have a raised central portion, instead the cavity could be a cup-like protuberance on the exterior surface of the disc. The interior of the dome-like configuration surrounding the cavity may be filled with a suitable material for example foam plastics to improve the acoustics. Other variations are also possible.

CLAIMS

1. An earphone adaptor comprising two ear cups joined together by adjustable connecting means so that the cups are disposed in mutual opposition, each ear cup comprising an annular deformable ear pad and a connecting plate adapted to receive and retain an ear plug of
5 a plug-type earphone and to allow sound to pass from the earplug to respective ears of the earphone adaptor's user.
2. An earphone adaptor as claimed in claim 1 in which the connecting plate has a raised centre portion, this raised portion having a cavity therein adapted to receive an ear plug of a plug type earphone.
- 10 3. An earphone adaptor as claimed in claim 2 in which the raised centre portion and the cavity are of a resilient material so that the cavity will deform and retain the ear plug within it.
4. An earphone adaptor as claimed in any of claims 1, 2 or 3 in which the annular pads are of plastics, foam or foam plastics.
- 15 5. An earphone adaptor as claimed in any preceding claim in which the connecting means is a U-shaped strip of flexible material, the ear cups being attached at respective free ends of the strip and being slideably displaceable along the strip.
6. An earphone adaptor as claimed in any preceding claim in which
20 stoppers are provided which are adapted to be received and retained by the connecting plate in place of the ear plugs of a plug type earphone.



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Office

EUROPEAN SEARCH REPORT

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Application number

EP 85 30 5963

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	US-A-4 243 851 (R. FORNEY) * Whole document *	1-4	H 04 R 1/10
Y		5, 6	
Y	--- US-A-3 787 899 (A. KRAWAGNA) * Column 2, lines 1-62; figures *	5	
Y	--- DE-A-1 541 256 (L. FRIEDER) * Claims; figures *	6	
A	--- US-A-3 810 525 (R. CRENNNA) * Whole document *	1-4	
A	--- GB-A- 721 258 (STANDARD TELEPHONES AND CABLES) * Whole document *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4)
	-----		H 04 R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 05-12-1985	Examiner MINNOYE G.W.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			