

[54] EAR PLUG

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[58] Field of Search..... 128/151, 152

[56] **References Cited**

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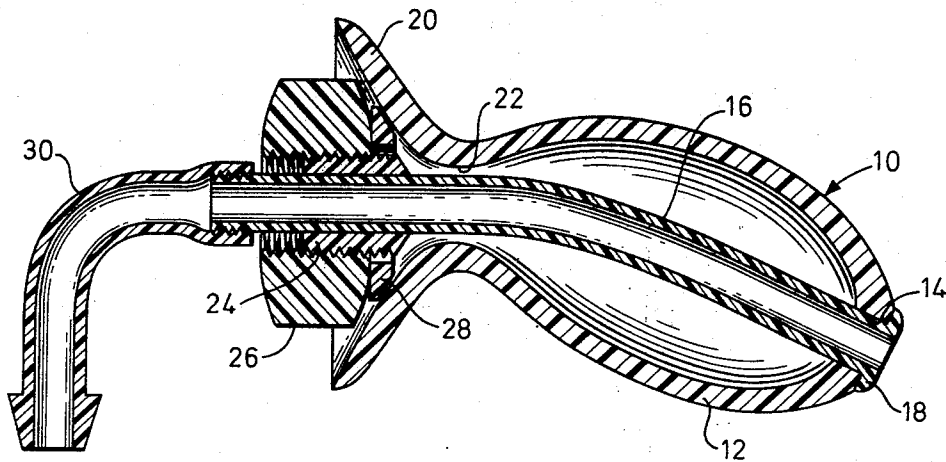
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[57] **ABSTRACT**

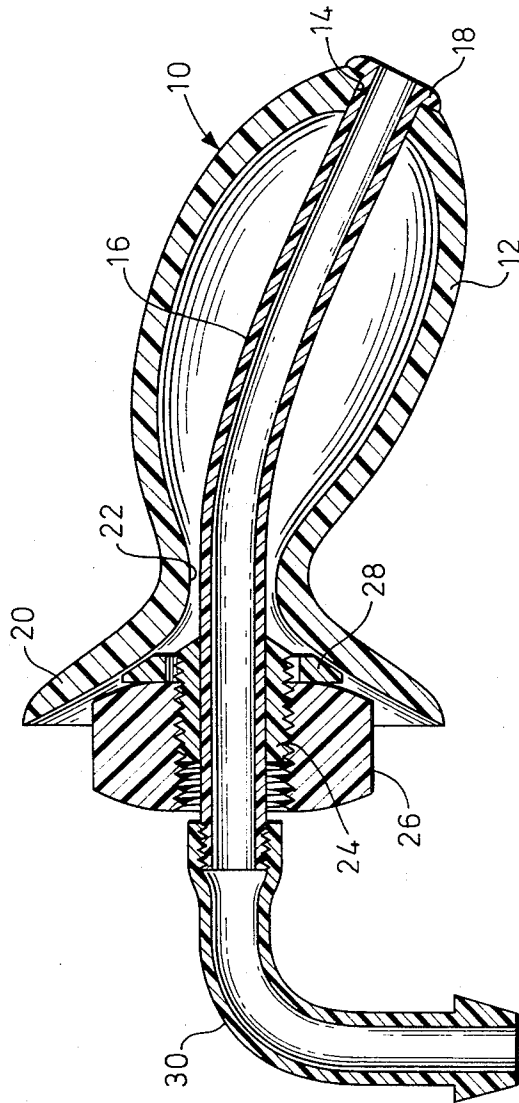
The invention relates to an ear plug to be inserted into the auditory meatus of an ear, having an exterior member of a soft flexible material and an interior tubular member which extends through the exterior member from one end thereof, and having manually operable means, operatively connected with the exterior as well as the interior member, operable to cause an expansion of the exterior member and thereby engage the exterior member firmly against the wall of the auditory canal.

**3 Claims, 1 Drawing Figure**



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EAR PLUG

DESCRIPTION OF THE INVENTION

The present invention relates to an ear plug or ear insert adapted to be inserted into the auditory meatus of an ear and of the type comprising an exterior member of a soft flexible material and an interior tubular member of relatively stiff material which is connected with the exterior member at that end thereof which extends into the auditory canal when the ear plug is inserted therein.

Ear plugs of this type have been developed to avoid the necessity of making individual ear moulds which are relatively expensive and ear plugs of the type referred to are manufactured in a plurality of standard sizes. It is, however, desirable that an ear plug should fit tightly in the auditory canal and even with a plurality of standard sizes of ear plugs of the type herein before referred to, the individual variations of the shape and size of the auditory canal are so numerous that only in a few cases, a perfect fit can be obtained.

It is therefore a purpose of the invention to provide an ear plug of increased versatility with respect to the possibilities of obtaining a desired fit and which at the same time is a low cost equipment.

With this and other objects in mind which will appear from the following specification the invention will be described with reference to the accompanying drawing which is an enlarged cross section through an embodiment of an ear plug according to the invention.

The ear plug illustrated has an exterior member generally referred to by 10 with a body portion 12. The exterior portion 10 is manufactured of a soft flexible material such as a soft synthetic rubber-like material and the body portion 12 is in the form of a flexible bulb having generally pear shaped configuration with an exterior diameter which enables the member to be introduced into the auditory canal of a human ear without any substantial obstruction.

At the end which is introduced into the auditory canal the body portion 12 has an aperture 14 of an interior diameter which substantially corresponds to the exterior diameter of a tubular member 16 of a relatively stiff material which extends through the exterior member and terminates at the exterior end thereof remote from the aperture 14.

At the end of the tubular member 16 which passes through the aperture 14 the tubular member is provided with a radially extending flange 18 which as shown in the drawing may be imbedded in a correspondingly shaped recess at the end of the body member 12 and which serves as an abutment to prevent the end of the tubular member 16 to be pressed through the end of the exterior member 10, even when the exterior member is subjected to pressure in direction of the tubular member 16.

The base or outer end 20 of the member 10 consists of a slab or flange 20 and the entrance to the interior of the member 10 is defined by an aperture 22 through which the tubular member 16 extends and relatively to which it can move axially.

In the embodiment illustrated, a sleeve 24 is secured on the tubular member 16 outside the base or outer end of the exterior member 10. The sleeve is screw-threaded at its periphery and on the screw-threaded sleeve a screw-threaded nut 26 is provided. Preferably, a washer 28 of a suitable material such as Teflon is pro-

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vided between the nut 26 and outer end of the exterior member 10.

The tubular member 16 extends through the screw-threaded portion which may be secured on the tubular member by a suitable adhesive and is in the embodiment illustrated connected with an exterior tubular member 30 which may be adapted to connect the tubular member 16 with an exterior source such as the outlet from a hearing aid.

Alternatively, it will be possible to provide the exterior end of the tubular member 16 with a stopper in the event that it is desired to use the device according to the invention as a protective device for preventing excessive noise to enter the auditory canal.

In practical use, the ear plug is with the nut 26 loosened inserted in the auditory canal and the nut is tightened whereby the exterior member 10 expands and enters into firm engagement with the wall of the auditory canal.

Obviously, sound transmitted through the tubular member 16 such as from a hearing aid will be transmitted to the auditory canal without interference from any disturbing sound and in the event that the entrance to the tubular member 16 is sealed, the device serves as a protective device against excessive noise.

It will also be appreciated that compared with the individual ear moulds the structure is inexpensive and can be produced in individual parts according to mass production methods and be assembled without difficulty.

Basically, the structure comprises the interior tubular member 16 of a predetermined length.

The screw-threaded portion may be integral with the interior tubular member 16 or in the form of a separate portion secured thereto by a suitable adhesive.

In addition thereto, the device consists of the exterior member 10 which is a prefabricated member of soft resilient material and the only extra member is the nut 26.

This entire structure can be made available with exterior member 10 in different diameters and dimensions which are not critical and with a few standard sizes of the exterior member 10 it will be possible in the case of a person needing a ear plug for a hearing aid to determine which standard size of the exterior member is most suitable and then mount the exterior member on the rest of the structure to give a fit of a hearing aid which is nearly as perfect as an individual ear mould, but at a much less price.

As shown in the drawing, the configuration of the interior member 16 is arcuated, but it will be appreciated that the relatively stiff interior portion may have any shape which is convenient for introducing the assembled device into the auditory canal of persons in various parts of the world depending on their characteristic shape of the auditory canal.

I claim:

1. An ear plug to be inserted into the auditory canal of a human ear comprising:
  - a tubular member (16) of a relatively stiff material and having along at least a part of its length a screw-threaded portion (24);
  - a substantially pear-shaped hollow member (10) of a relatively soft resilient material surrounding said tubular member (16) and extending from adjacent said screw-threaded portion of said tubular member (16) to the end thereof, said pear-shaped hol-

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low member having an outwardly extending flange (20) in the portion thereof adjacent said screw-threaded portion (24) of said tubular member (16);

a screw-threaded nut member (26) mounted on said screw-threaded portion of said tubular member (16) and engaging an internal portion of said outwardly extending flange (20) for preventing displacement of said pear-shaped hollow member (10) beyond the end of said tubular member, such that when said nut member (26) is threaded onto said tubular member (16), said pear-shaped hollow member (10) is caused to deform.

2. An ear plug according to claim 1 including a washer (28) interposed between said nut member (16) and said flange (20), said washer (28) bearing against said internal portion of said flange (20) in use.

3. An ear plug according to claim 1 wherein said tubular member (16) has a flange (18) at the end thereof and said pear-shaped hollow member (10) has an opening at the end thereof through which said tubular member (16) extends with the flange (18) of said tubular member bearing against the outer surface of said pear-shaped hollow member (10).

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