Nov. 11, 1941. K. L. WADE 2,262,568

EAR PROTECTOR

Filed Oct. 21, 1939

Fig. 1.

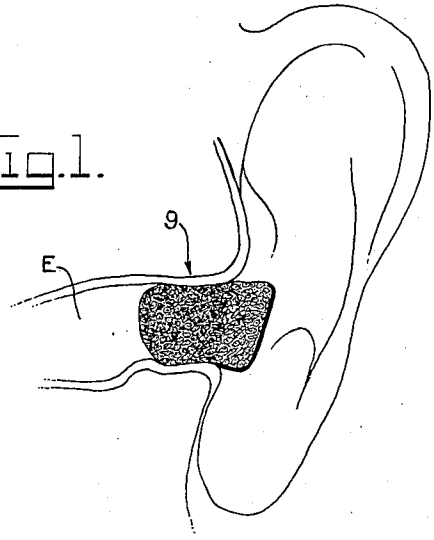


Fig. 2.

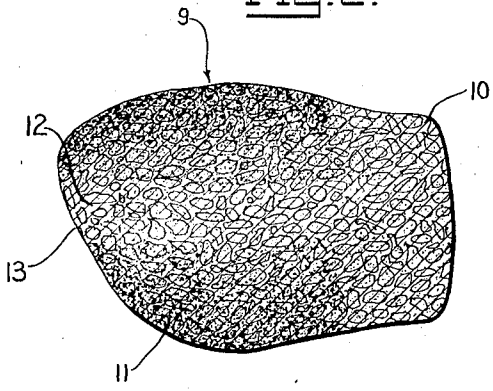
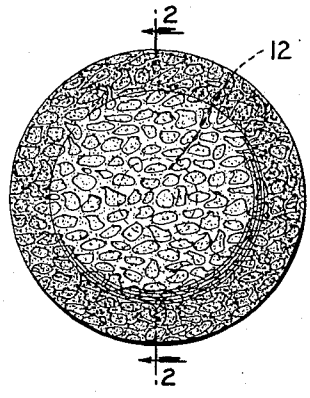


Fig. 3.



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EAR PROTECTOR

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2 Claims. (Cl. 128—152)

This invention relates to ear protectors which are inserted directly in the outer ear, and the present invention is for the purpose of protecting the organs of the ear from disturbing vibrations, without irritating the auditory canal and without causing an excessive pressure on the ear drums.

Ear protectors adapted to be inserted directly in the ear are, in general, not satisfactory, as a protection against excessive noise, unless they reduce hearing to a minimum, excepting sound by bone conduction. The ear protector disclosed by Patent Number 1,016,877, while affording ventilation which will prevent pressure on the drums, and non-ventilated ear protectors available, are irritating to the average wearer if worn for any length of time. For that reason and the reason that they do not mitigate noise as effectively as a wax closure, they are not generally employed except as ear plugs for swimmers.

An ear closure which has been in use for many years as protection against excessive noises consists essentially in a wax and cotton mixture, which the user kneads into a pliable ball-like mass and presses into the ear to make a closure of the auditory canal. This is a most effective way of protecting the ears from noise thus far made available to the public. However, this wax and cotton stopple has the disadvantage in that it sets up a pressure on the ear drums upon insertion. It is well known that a balance of pressure is normally maintained on the drums between the Eustachian tube and the auditory canal. It is important that this balanced pressure be maintained. Another disadvantage in wax stopples is that the wax tends to adhere to the ear, and since the adhesion is as great between the stopple and the ear as between the cotton and the wax, some part of the wax remains in the ear after removal of the stopple.

It is the object of the present invention to provide an ear protector which is as effective as the present wax stopple without setting up excessive air pressure in the auditory canal or on the ear drums, and to mitigate the adhesion of wax to the ear upon removal of the device. A further object is to provide an ear protector of porous latex impregnated with wax, which is readily inserted into any average ear canal without kneading or adjustment. A still further object is to provide an ear protector, one end of which is partially impregnated with a composition of an amorphous wax and petroleum jelly having a melting point of approximately 125° F.

All or almost all waxes contain some crystalline material although the predominant characteristic is amorphous. Such a wax of a mineral type is produced from crude oil which has essentially a paraffin base. Likewise, by custom in the trade, certain waxes of a vegetable nature, are frequently referred to as amorphous. Any of these waxes, and so-called waxes, when mixed with petroleum jelly in proper proportions will produce a soft and inelastic ear protector when used to impregnate a unitary porous body. For example, one composition producing a satisfactory result consisted of 12 parts of Japan wax having a melting point of 130° F. and one part of petroleum jelly. The composition melted at approximately 125° F. Another suitable wax composition was prepared from three parts of amorphous mineral wax from paraffinic crude oil with a melting point of 145° F. and one part of petroleum jelly. This composition also had a melting point of approximately 125° F. In addition, both water soluble and water insoluble synthetic waxes procurable on the market under the classification of amorphous waxes were combined with petroleum jelly to produce a waxy material of suitable plasticity and a melting point above body temperature. It may be seen that there exists a large number of waxes and so-called waxes of an amorphous character which when mixed with the proper amount of petroleum jelly will result in a compound having suitable melting point and impregnating characteristics.

This improved ear protector is more particularly shown in the accompanying drawing in which

Figure 1 shows the ear protector of this invention as in the ear;

Figure 2 is a longitudinal section on line 2—2 of Figure 3.

Figure 3 is an end view of the ear protector showing the partially impregnated end.

The ear protector 9 is preferably stamped from sheet stock or cut from round stock of porous and resilient latex. One end of the latex designated by 11, is immerged in a solution of Japan wax and petroleum jelly or other suitable wax compound having a melting point of about 125° F. The length of time which this end 11 is left in the compound determines the degree of impregnation and the area impregnated. Thus by varying the time which the latex is in the solution, the extent of both the porosity and plasticity may be governed. The porous core 12 can be untouched by the solution or it may be slightly impregnated and yet remain sufficiently porous to allow ventilation to the ear drums. Likewise, by using a more or a less plastic solution, the

resulting plasticity and porosity may be directly governed. It has been found that approximately one part of white vaseline petroleum jelly to twelve parts of Japan wax having a melting point of 125° results in a protector when mixed with the latex which is not generally sticky and yet requires no kneading or adjustment with the fingers before insertion. The porosity of an ear protector 9 made by impregnating the latex with such a solution depends on the time which end 11 is in the solution. At melting temperature or a little higher, a few seconds in the solution will leave core 12 about one half the diameter of the ear protector 9.

After the end 11 has been impregnated as described, a section at the waxed end 13 may be cut away to make the core 12 a continuous one. At the same time the end and sides are shaped about as shown in Figure 2; this being somewhat representative of the shape normally produced on insertion in the average ear.

The section 10 is not impregnated with the solution, and allows the user to insert and remove the ear protector without handling and possibly soiling the waxed area.

The action of my improved ear protector depends on the resilient and porous latex plus the sound absorbing qualities of wax, the combination of which makes for a flexible and easily inserted ear protector, and yet one which does not noticeably irritate the ear and it does provide ventilation to E through core 12, which may be either slightly impregnated with wax or the plain latex porous structure. The combination of porous latex and wax makes for an excellent locking action in the meatus of the ear, and the protector 9 may be removed without leaving any appreciable amount of wax in the ear for the reason that there is a greater adhesion between the rubber of the latex and the wax than between the wax and the skin. The ear protector 9 is sanitary to use in the respect that it is not necessary to shape or handle the end 11, which locks in the ear.

Having thus described my invention what I claim and desire to protect by Letters Patent is:

1. An ear protector comprising a porous latex body having a generally cylindrical form, one section of which is impregnated with a waxy material of a composition of an amorphous wax and a petroleum jelly having a melting point of approximately 125° F., said section being adapted to be inserted in the auditory canal and serving as a soft inelastic stopple for the absorption of sound and the balance of the porous latex body being unimpregnated and serving as a means for holding the device for insertion and removal.

2. An ear protector comprising a porous body having a generally cylindrical form, one section of which is impregnated with a waxy material of a composition of an amorphous wax and a petroleum jelly having a melting point above body temperature, said section being adapted to be inserted in the auditory canal and serving as a soft inelastic stopple for the absorption of sound, and the balance of the porous body being unimpregnated and serving as a means for holding the device for insertion and removal.

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