Sept. 11, 1962 W. G. SOCKEL ETAL 3,052,887

FACE PROTECTIVE DEVICES

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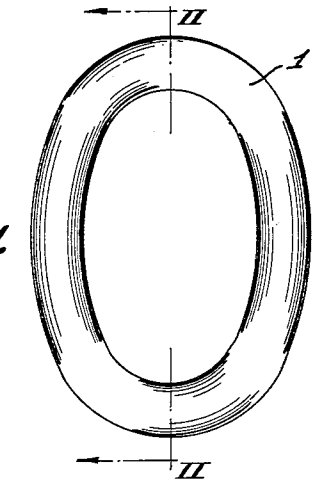


Fig. 1.



Fig. 2.

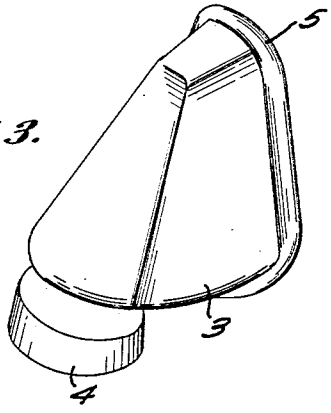


Fig. 3.

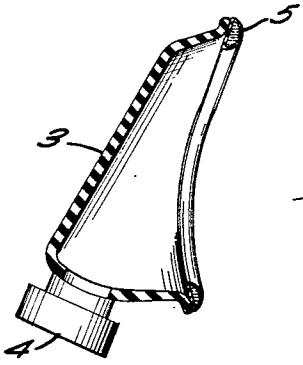


Fig. 4.

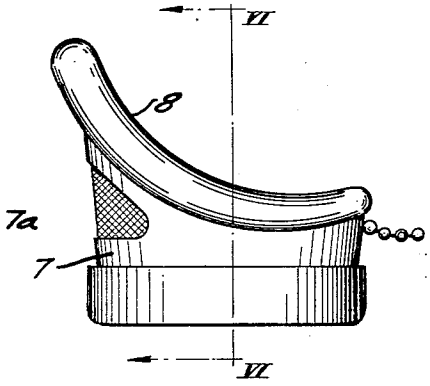


Fig. 5.

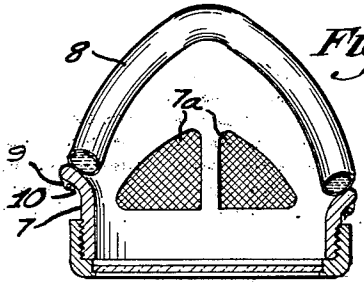


Fig. 6.

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FACE PROTECTIVE DEVICES

Filed Oct. 24, 1958 2 Sheets-Sheet 2

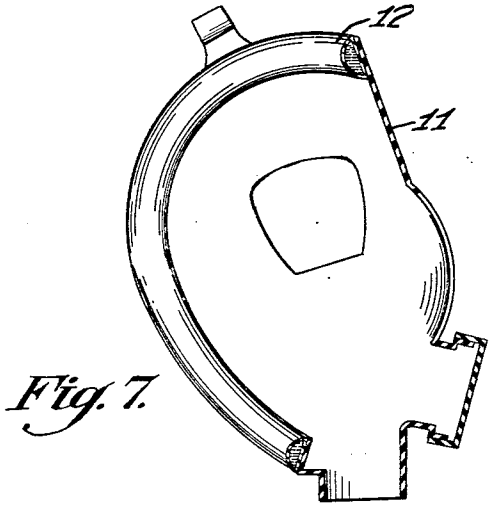


Fig. 7.

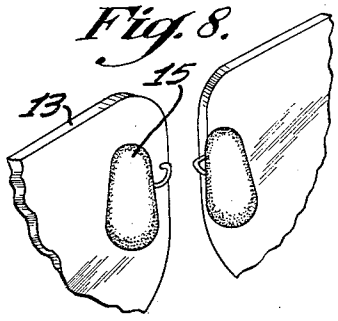


Fig. 8.

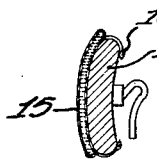


Fig. 9.

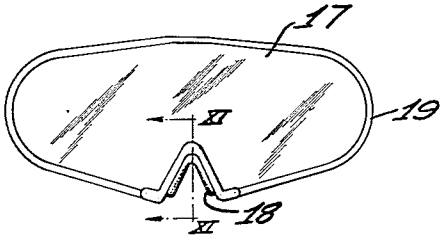


Fig. 10.



Fig. 11.

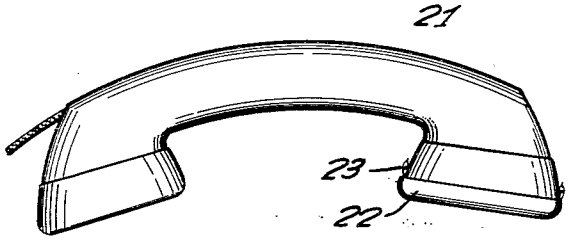


Fig. 12.

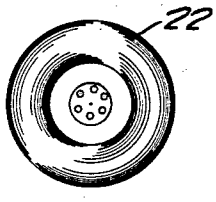


Fig. 13.

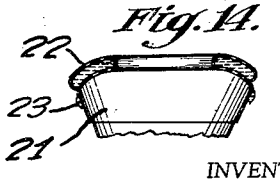


Fig. 14.

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3,052,887

FACE PROTECTIVE DEVICES

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Filed Oct. 24, 1958, Ser. No. 769,501
5 Claims. (Cl. 2—9)

This invention relates generally to industrial safety protective devices and, more particularly, to face protective devices for protecting parts or organs of the face, such as the eyes, nose and mouth from dust or flying particles or for protecting the ear against loud noises.

An outstanding disadvantage of conventional types of protective devices for protecting the nose, ears and other portions of the face of the wearer is that they are very uncomfortable to wear, particularly devices worn for long periods of time, such as industrial goggles and respirators. Attempts have been made to cushion the mouth portion of a respirator, which portion surrounds the nose, cheeks and chin, by reversely bending the mouth portion to give it flexibility, or by attaching ring-like liners of rubber to the mouth portion so as to provide a cushioned fit against the face of the wearer. However, these types of liners have not proved entirely satisfactory since they still provide appreciable discomfort to the wearer, particularly after wearing the device for long periods of time. Furthermore, they do not actually provide the desired cushioning effect and depend too much upon a proper fit of the device.

An object of our invention is to provide a novel liner or cushion for industrial protective devices which liner contains fluid and which will overcome the above-named disadvantages by providing a cushioned, extremely comfortable fit around facial portions of the wearer.

A more specific object of our invention is to provide a flexible, tubular liner or cushion of substantially annular shape and containing fluid for attachment to, and for lining the mouth portion of a cup-like protective device, such as respirator, mask or goggle, which liner will provide an extremely comfortable fit so that the device may be worn for very long periods of time without fatigue.

Other objects and advantages of the invention will become more apparent from a study of the following description taken with the accompanying drawings wherein:

FIG. 1 is a plan view of a substantially annular liner filled with a fluid and embodying the principles of the present invention.

FIG. 2 is a vertical cross-sectional view taken along line II—II of FIG. 1.

FIG. 3 is a perspective view of a respirator for protection against dust and fumes and having a liner surrounding the nose, mouth and cheeks of the wearer similar to that shown in FIGS. 1 and 2.

FIG. 4 is a vertical, cross-sectional view taken through the respirator shown in FIG. 3.

FIG. 5 is a side, elevational view of one of two cups of a pair of industrial protective goggles on which is detachably mounted a liner filled with a fluid in accordance with principles of the present invention.

FIG. 6 is a vertical, cross-sectional view taken along line VI—VI of FIG. 5.

FIG. 7 is a vertical, cross-sectional view of a gas mask equipped with a similar liner.

FIG. 8 is a fragmentary, perspective view showing a pair of nose pads of spectacles or goggles, which pads are provided with detachable liners filled with fluid in accordance with the teachings of the present invention.

FIG. 9 is a vertical, cross-sectional view through one of the pads and liners shown in FIG. 8.

FIG. 10 is a plan view of a one-piece plastic lens of a protective eye shield and which is provided with a detachable nosepiece having a fluid filled flexible liner.

FIG. 11 is an enlarged, cross-sectional view taken along line XI—XI of FIG. 10.

FIG. 12 is an elevational view of a French type telephone in which the receiver portion is provided with a detachable, fluid-filled liner in accordance with the present invention.

FIG. 13 is a plan view looking into the earphone portion of the telephone of FIG. 12; and

FIG. 14 is a cross-sectional view taken through a portion of the receiver shown in FIG. 12.

Referring more particularly to FIGS. 1 and 2 of the drawing, numeral **1** denotes an endless tube of flexible material, such as rubber or preferably a plastic material, such as vinyl plastic, which has flexibility as well as a certain degree of elasticity. The tube **1** is partially filled with a fluid **2**, which fluid will be described in detail hereinafter. Air is expelled from the tube through a valve (not shown) as liquid is introduced through a second valve (not shown).

FIG. 3 shows a respirator **3** in the form of a mask provided with the conventional exhalation valve **4** and having a mouth portion onto which is attached, such as by heat sealing, a flexible, fluid filled tube **5** such as shown in FIGS. 1 and 2.

FIG. 5 shows one of the cups **7** of a pair of industrial, protective cup goggles having a ventilator portion **7a** and having a curved rim portion provided with a detachable liner **8** which is filled with a fluid and which has an extension **9** formed of two sheets extending from the periphery of the tube, in which extension there is sandwiched an elastic rubber band **10** under tension. The outer peripheral edge of the two sandwiching sheets of the extension may be heat sealed to seal the band therein.

FIG. 7 shows a gas mask or facial mask **11** for protection against dust in which the marginal portion, which is adapted to surround the forehead, sides of the face and chin of the wearer, has attached thereto a liner **12** which if filled with a fluid in accordance with the present invention and which may be of the type shown in FIGS. 1 and 2.

FIG. 8 shows lenses **13** of safety spectacles, which lenses may be of plastic material or safety glass. The spectacles are provided with nose pieces **14** each of which is padded with a detachable padding **15** of plastic material filled with a fluid and having an outer peripheral extension **16** which is adapted to become attached to a corresponding portion of the nose piece **14**, said extension having a rubber band **16** in the extreme periphery thereof so as to hold the extension securely on the pad as the band is under tension.

FIGS. 10 and 11 show a one-piece lens **17** such as used in safety protective glasses, which lens is of some suitable plastic material and which is provided on the periphery **19** thereof with a grooved portion to fit at eye shield (not shown).

The nose surrounding portion is provided with an angle shaped tubular element **18** which is filled with a fluid so as to provide a comfortable, cushioned fit about the nose of the wearer.

FIG. 12 shows a French type telephone **21** which is provided with a detachable tubular member **22** of substantially annular outline having extending from the peripheral portion thereof an extension **23** in which is sandwiched a rubber band **23** under tension so that it will become snugly embraced about the periphery of the receiver and hold the tubular member **22** firmly thereagainst. The receiver may be any other type such as a pair of receivers of a headset as used by telephone and radio operators and the like.

The fluid which may be used in any of the above mentioned modifications may be air or gas, but far superior results are obtained if the fluid is in the form of a liquid, semi-liquid or solid having a high viscosity. A suitable liquid may be water or may be a mixture of water and glycerine, such as one having 30 to 70% glycerine, or it may be a syrup-like material, or may be a flowable or plastic solid such as grease or a jell. By making the material a liquid or a flowable solid an extremely comfortable fit will be provided on the face portions, and at the same time such material, since relatively incompressible will not yield to an abnormal extent in the event of an extremely heavy flow, but will be able to withstand such heavy flows by the flexibility of the tube and flowability of the liquid material.

While FIGS. 12, 13, 14 show the liner as applied to a telephone receiver, it may be attached instead to headsets intended solely for excluding outside noises, or perhaps the receiver of a stethoscope.

Thus it will be seen that we have provided a highly efficient fluid-filled liner along the marginal edge or face-contacting portions of industrial safety protective devices, such as respirators, gas masks, goggles, earphones, nose protectors, eye shields, and the like, which liner provides an extremely comfortable fit and which readily yields so as to conform to contours of the face; furthermore, I have provided a fluid-filled liner preferably containing a liquid which will provide a dust-tight fit with face of the wearer so as to exclude dust, fumes, etc., also which enables wearing of protective devices for very long times without fatigue.

While we have illustrated and described several embodiments of our invention, it will be understood that these are by way of illustration only, and that various changes and modifications may be made within the contemplation of our invention and within the scope of the following claims.

We claim:

1. A protective device having a mouth portion adapted to surround and engage a facial feature of the wearer, a tube of substantially elastic and flexible material in the form of an endless loop extending along said mouth portion, a partial filling of viscous liquid in said tube, said tube having a peripheral extension in the form of two sheets heat-sealed at their outer peripheries, an elastic band contained between and extending throughout the entire periphery of said sheets and adapted to encircle said mouth portion so as to yieldingly and tightly hold said tube thereon and constituting the sole means for holding said tube on said device, whereby a yieldable air-tight, comfortable fit is provided between said device and the face of the wearer.

2. A protective device as recited in claim 1 in the form of a goggle cup having an outwardly flared mouth portion.

3. A protective device as recited in claim 1 in the form of an ear surrounding cup.

4. A protective device as recited in claim 2 in which said cup encloses a phone receiver.

5. A protective device as recited in claim 1 in the form of a respirator face mask.

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