

Oct. 23, 1945.

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2,387,522

GOGGLE

Filed Dec. 29, 1943

2 Sheets-Sheet 1

FIG. 1

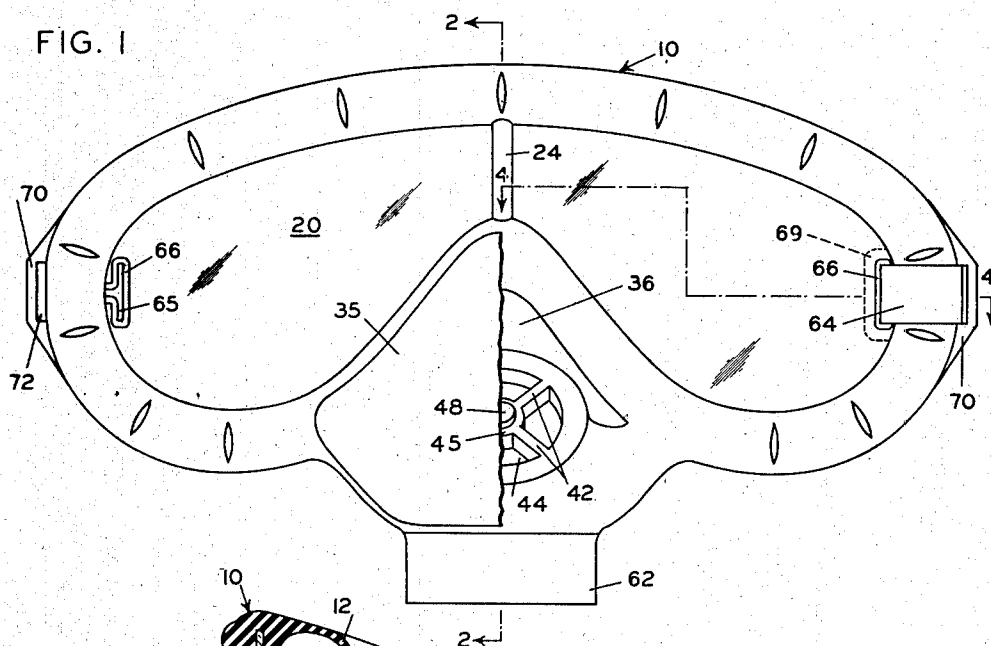


FIG. 2

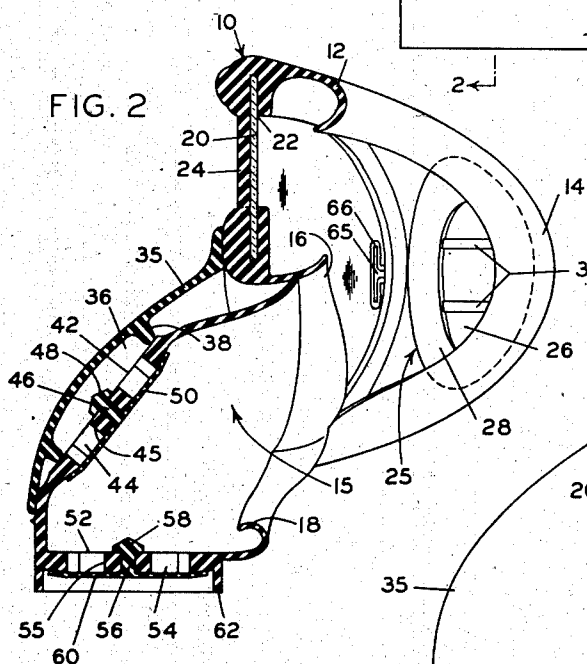
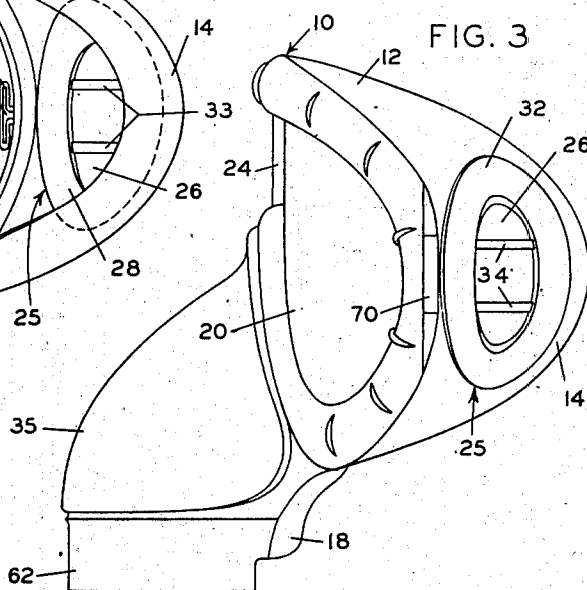


FIG. 3



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FIG. 4

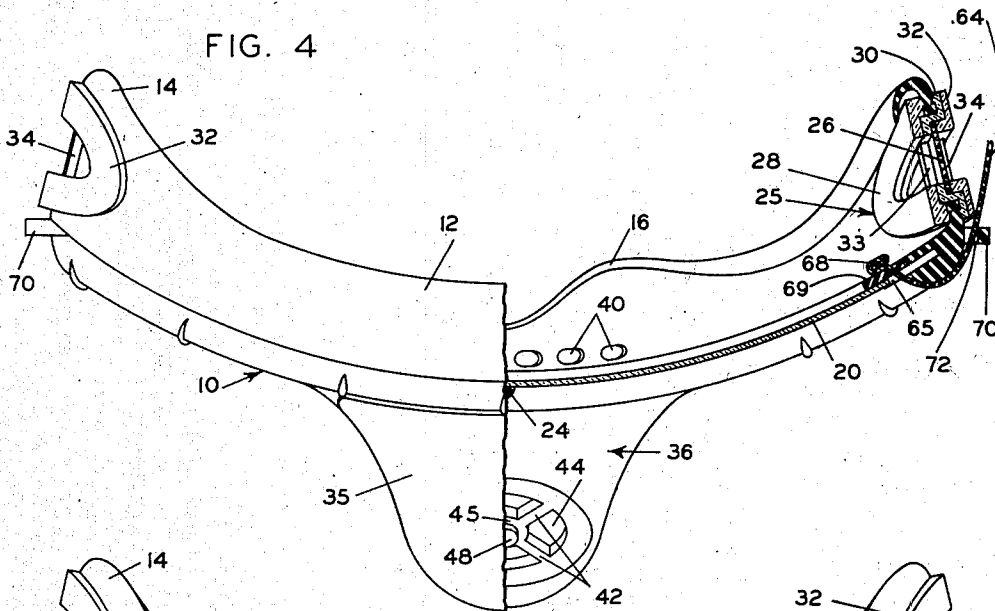
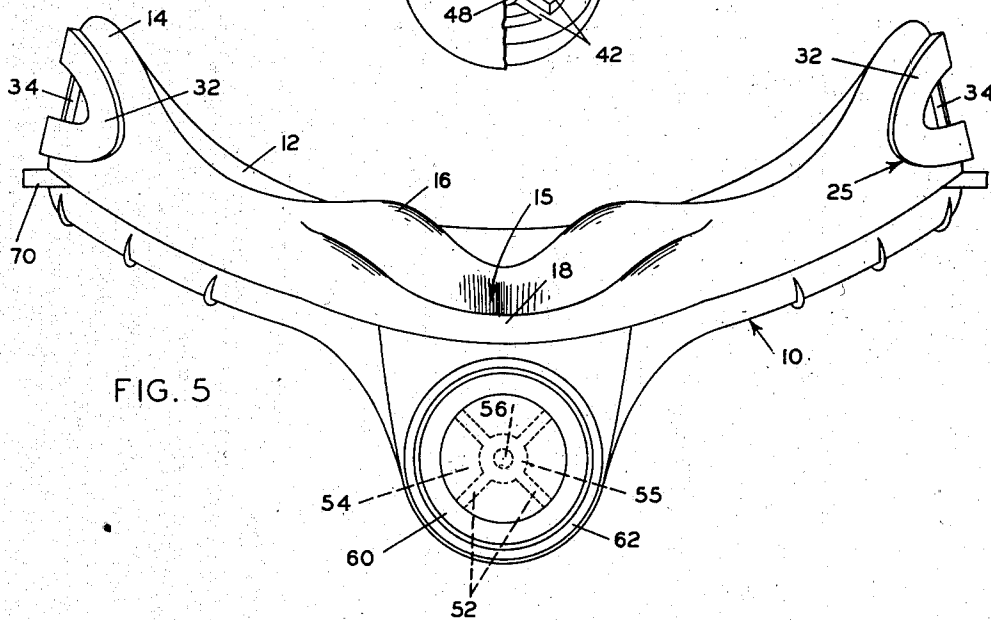


FIG. 5



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GOGGLE

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5 Claims. (Cl. 128—148)

This invention relates to goggles, and it is one object of the invention to provide a new and improved goggle which will be proof against internal fogging of the lens portion under substantially all service conditions.

Another object is to provide such a goggle wherein the natural breathing of the wearer thereof serves to provide a system of forced ventilation for the interior or eye portion of the goggle, and more particularly to provide such a goggle wherein means are provided for causing the air inhaled by the wearer thereof to pass first between the lens portion and the eyes of said wearer and thereby to provide forced ventilation for the interior of the goggle, and wherein means are also provided for preventing air exhaled by said wearer from re-entering the interior of the goggle.

A further object is to provide a goggle having the above advantages and comprising a substantially unitary frame of rubber or like material provided with a system of simple valves operated by the natural breathing of the wearer of the goggle to produce ventilation in the manner outlined above.

Still further objects are to provide a goggle having the above advantages wherein means are provided for diffusing the stream of air entering the interior of the goggle and in addition to provide air-diffusing means which will also be capable of rendering the interior of the goggle proof against dust or other undesirable foreign matter which it may be desirable to exclude, and which will also be light and convenient as well as easy to clean or replace.

Additional objects and advantages will in part appear and in part be pointed out in the course of the following description of one or more embodiments of the invention, which are given as non-limiting examples, in connection with the accompanying drawings, in which:

Figure 1 is a front elevation, partly broken away, of a goggle comprising an embodiment of the invention;

Figure 2 is a section on the line 2—2 in Fig. 1;

Figure 3 is a side elevation of the goggle shown in Fig. 1;

Figure 4 is a top plan, partly in section on the line 4—4 in Fig. 1; and

Figure 5 is a bottom view of the goggle shown in Fig. 1.

In the drawings, the main frame or body 10 of the goggles preferably comprises a unitary structure formed as by molding of a relatively flexible material such as rubber. Preferably frame 10 will initially be provided with a curved form as shown particularly in Figs. 4 and 5, in order to adapt it to the face of the wearer, and it is extended along its rearward side 12 and 14 to form face-engaging portions. As is shown

particularly in Fig. 2, face-engaging portions 12 and 14 may be formed into a resilient roll to facilitate their fit with the wearer's face. There is also provided a nose-receiving space or chamber 15 defined by extended lips or flanges 16 and 18 which are adapted to seal the nose of the wearer from the main interior portion of the goggle for reasons which will become apparent hereinafter.

Frame 10 is preferably formed to enclose a single lens aperture and a unitary lens blank 20 adapted to engage a slot 22 within frame 10. If desired, there may be provided also a unitary web 24 on the front of frame 10 adapted to maintain the upper and lower portions thereof in the proper spaced relationship. Web 24 will in general be found desirable in view of the relatively heavy construction of the nose portion of the goggle, but other lens-fastening and supporting means may be substituted therefor, such for example as a plurality of rivets or similar elements joining the top and bottom edges of lens 20 to frame 10 and preferably positioned approximately adjacent the ends of web 24.

The above-described general features of the goggle of the invention are subject to considerable modification. The essentials of those portions of the goggle are principally only that in the first place the eyes of the wearer are sealed from his nose with the exception of a valve-controlled opening described hereinafter, and in the second place that the nose of the wearer be sealed from the outer atmosphere except for additional valve means, also described hereinafter.

As has already been pointed out, it is one object of the invention to provide means such that all air inhaled by the nose of the wearer of the goggle pass first through the space enclosed by the goggle lens, and second, that all air exhaled by the nose of the wearer be prevented from re-entering said space. It is also desirable that the stream of air entering the goggle be broken up or diffused relatively thoroughly, and the means for producing these results are shown particularly in Figs. 2 and 4. In each end portion 14 of frame 10 there is provided an aperture in which there is mounted an element 25 of any suitable material such as a metal or plastic, having mounted therein a cloth 26 or similar element capable of diffusing air passing there-through. As is shown particularly in Fig. 4, element 25 may advantageously comprise a pair of complementary parts 28 and 30 adapted to engage the material of frame 10 and which may be secured together in any suitable way as by means of cement. An additional retainer rim 32 is also provided for the purpose of securing cloth 26 in element 25, and both of elements 30 and 32 may be provided with a plurality of reinforcing ribs 33 and 34.

Cloth 25 serves other useful purposes in addition to diffusing the flow of air into the interior of the goggle and thus minimizing the wearer's consciousness of the incoming air. It also acts as a filter for dust or any other foreign material which it may be desirable to exclude from the wearer's eyes. Furthermore, if the goggle is to be used for dark adaptation purposes, in which case lens 20 will comprise dark red material, cloth 25 should be of such color and texture as to exclude all undesired light. It should be pointed out, however, that the invention is in no way limited to the use of diffusing means or to the particular mounting means therefor shown in the drawings. Many variations in this construction may be made without departing from the essentials of the invention. For example, there may instead be provided simply a plurality of apertures through the upper portion of face-engaging roll 12, and if diffusing means are also desired a suitable strip of felt may be mounted within said roll in any desired way.

It will be seen that element 25 provides ready communication between the outside atmosphere and the interior portion of the goggle, but not to nose chamber 15 and the wearer's nose. The means for accomplishing the latter result are shown particularly in Figs. 1, 2 and 4. Shield 35, preferably of the same material as the remainder of frame 10, is mounted on the front thereof as by means of a suitable cement, and forms with the front of frame 10 an additional chamber 36. Shield 35 is provided with a plurality of internal nubs 38 adapted to maintain it in spaced relation with frame 10. A plurality of apertures 40 in the upper part of nose-engaging portion 16 provide communication between the interior of the goggle and air chamber 36. Communication between chamber 36 and nose chamber 15 may be provided by means of any suitable one-way or flutter valve, and an example of a satisfactory valve device is shown particularly in Figs. 1 and 2.

Frame 10 is molded initially with valve-mounting means comprising a plurality of ribs 42 interspersed with apertures 44 and connecting with a central rim 45. Valve stem 46 of valve 50 is adapted to engage in rim 45 and is provided with an enlarged head 48 which will prevent its withdrawal therefrom. Valve 50 is preferably made of a relatively thin, flexible material such as rubber and should be sufficiently light and flexible to offer minimum resistance to the passage of air through apertures 44 during inhalation by the wearer of the goggle, but should at the same time be sufficiently firm to seal said apertures at all other times.

It will now be apparent that each time the wearer of the goggle of the invention inhales through his nose, he draws air through diffusing element 26 into the interior of the goggle, and thence through apertures 40 into chamber 36, whence it passes by way of apertures 44 and valve 50 into nose chamber 15 and the nose of the wearer. It will also be apparent that the one-way action of valve 50, together with the sealed fit of nose chamber 15 to the face of the wearer, serves to prevent exhaled air from returning to the interior of the goggle and thus insures maintenance of the desired fog-free condition of lens 20.

At the lower part of nose chamber 15, there is provided a further valve assembly similar in function to valve 50 for purposes of exhalation. Any convenient one-way valve may be used, and the illustrated example comprises ribs 52, aper-

tures 54, central rim 55, valve stem 56 provided with enlarged head 58, and valve 60 corresponding in construction and action to valve 50. There will preferably be provided also a protecting rim 62 for valve 60 which also acts to deflect exhaled air and prevent it from striking the outer surface of lens 20. If the goggle is designed for use at extremely low temperatures, rim 62 may be substantially increased in length in order to lessen the possibility of congealing the moisture in the exhaled air, which might tend to prevent valve 60 from sealing apertures 54 properly during inhalation. It will be noted, however, that valve 60 and its mounting means are necessary only to permit the wearer of the goggle to exhale through his nose, and may be dispensed with in a simpler embodiment of the invention. In such case, the lower part of nose chamber 15 will be permanently sealed and the wearer of the goggle will have to exhale at all times through his mouth.

Any suitable means may be employed for mounting the goggle of the invention on the head of the wearer, but the arrangement shown in Figs. 1 and 4 has been found particularly satisfactory. Straps 64 engage in slots 65, preferably T-shaped and lined with suitable grommets 66, in lens 20, and are provided at their inner ends with a suitable lug or bead 68 adapted to prevent withdrawal through slots 65. If desired, a slotted washer element 69 may be used to insure sealing of slots 65 against the passage of air therethrough during inhalation. Additional support may be provided if desired by means of ears 70 at the outer ends of frame 10 provided with transverse slots 72 through which straps 64 pass in encircling the head of the wearer. The invention is in no way limited to this mounting arrangement, however, and many satisfactory variations therein will be readily apparent to those skilled in the art.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A goggle of the character described comprising, in combination, lens means, frame means comprising rim means holding said lens means and resilient face-engaging means extending rearwardly from said rim means and cooperating with said lens means to define an eye chamber sealed from the nose of the wearer of said goggle, port means in said frame means communicating with the outside atmosphere, means defining a chamber enclosing the nose of said wearer and comprising means engaging the upper lip of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber while leaving exposed the mouth and lower part of the face of said wearer, means securing said last named means to said frame means, conduit means providing communication between said eye chamber and said nose chamber, valve means cooperating with said conduit means to permit the passage of gas from said

eye chamber into said nose chamber but preventing the passage of gas from said nose chamber into said eye chamber, and further valve means permitting the passage of gas from said nose chamber into the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber.

2. A goggle of the character described comprising, in combination, lens means, frame means comprising rim means holding said lens means and resilient face-engaging means extending rearwardly from said rim means and cooperating with said lens means to define an eye chamber sealed from the nose of the wearer of said goggle, port means in said frame means communicating with the outside atmosphere, supplemental frame means defining a chamber enclosing the nose of said wearer, means dependently securing said supplemental frame means to said first named frame means, said supplemental frame means comprising means engaging the upper lip of said wearer and sealing said nose chamber from the outside atmosphere and from said eye chamber while leaving exposed the mouth and lower part of the face of said wearer, means defining conduit means through said frame means providing communication between said eye chamber and said nose chamber, valve means cooperating with said conduit means to permit the passage of gas from said eye chamber into said nose chamber but preventing the passage of gas from said nose chamber into said eye chamber, and further valve means permitting the passage of gas from said nose chamber into the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber.

3. A goggle of the character described comprising, in combination, lens means, frame means comprising rim means holding said lens means and resilient face-engaging means extending rearwardly from said rim means and cooperating with said lens means to define an eye chamber sealed from the nose of the wearer of said goggle, port means in said frame means communicating with the outside atmosphere, supplemental frame means defining a chamber enclosing the nose of said wearer, said supplemental frame means comprising outer and inner layers and means maintaining said layers in spaced relation and thereby providing a third chamber overlying said nose chamber, means dependently securing said supplemental frame means to said first named frame means, said supplemental frame means comprising means engaging the face of said wearer and sealing said nose chamber from the outside atmosphere, port means in said first named frame means providing communication between said eye chamber and said third chamber, and valve means in said supplemental frame means permitting the passage of gas from said third named chamber into said nose chamber but preventing the passage of gas from said nose chamber into said third named chamber.

4. A goggle of the character described comprising, in combination, lens means, frame means comprising rim means holding said lens means and resilient face-engaging means extending rearwardly from said rim means and cooperating with said lens means to define an eye chamber sealed from the nose of the wearer of said goggle, port means in said frame means communicating with the outside atmosphere,

said face-engaging means including a flange portion overlying the bridge and sides of the nose of said wearer, supplemental frame means defining a chamber enclosing the nose of said wearer, means dependently securing said supplemental frame means to said first named frame means and spaced from the rearward edge of said nose-overlying flange portion, said supplemental frame portion comprising means engaging the face of said wearer and sealing said nose chamber from the outside atmosphere and from said eye chamber, shield means secured to the front of said supplemental frame means and secured to said first named frame means at points spaced from said first named securing means and thereby defining with said supplemental frame means a third chamber overlying said nose chamber, port means in said first named frame means between said shield means and said first named securing means, said port means providing communication between said eye chamber and said third named chamber, valve means in said supplemental frame means permitting the passage of gas from said third named chamber into said nose chamber but preventing the passage of gas from said nose chamber into said third named chamber, and further valve means permitting the passage of gas from said nose chamber into the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber.

5. A goggle of the character described comprising, in combination, lens means comprising a sheet of transparent, organic plastic material providing two eye portions connected by a nose-receiving portion of reduced area, frame means comprising rim means encircling and holding said lens means and resilient face-engaging means extending rearwardly from said rim means and cooperating with said lens means to define a single eye chamber sealed from the nose of the wearer of said goggle, port means in said frame means communicating with the outside atmosphere, supplemental frame means comprising a bulbous portion defining a nose enclosing chamber and means engaging the upper lip of said wearer and sealing said nose chamber from said eye chamber and from the outside atmosphere while leaving exposed the mouth and lower part of the face of said wearer, means securing said supplemental frame means to said first named frame means, shield means secured to the front of said supplemental frame means, means securing the upper edge of said shield means to said first named frame means in spaced relation with said means securing said supplemental frame means to said first named frame means, said shield means and said supplemental frame means thereby defining a third chamber overlying said nose chamber, port means in said first named frame means providing communication between said eye chamber and said third named chamber, valve means in said supplemental frame means permitting the passage of gas from said third named chamber into said nose chamber but preventing the passage of gas from said nose chamber into said third named chamber, and further valve means permitting the passage of gas from said nose chamber into the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber.

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