Oct. 3, 1950 J. S. WOLD 2,524,245

UNDERWATER GOGGLES

Filed July 15, 1946

FIG. 1

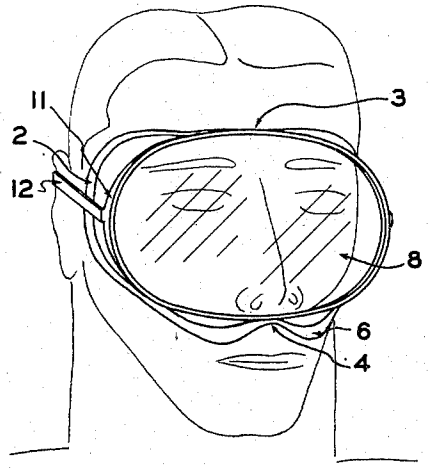


FIG. 3

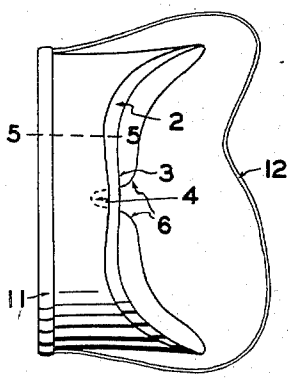


FIG. 4

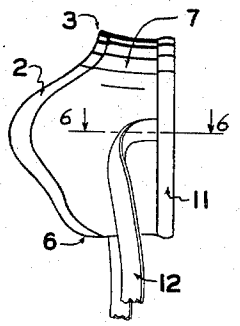


FIG. 5

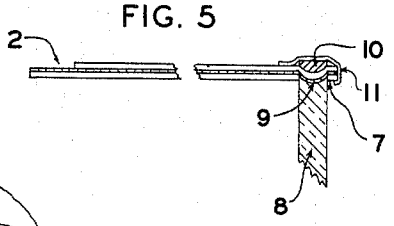


FIG. 2

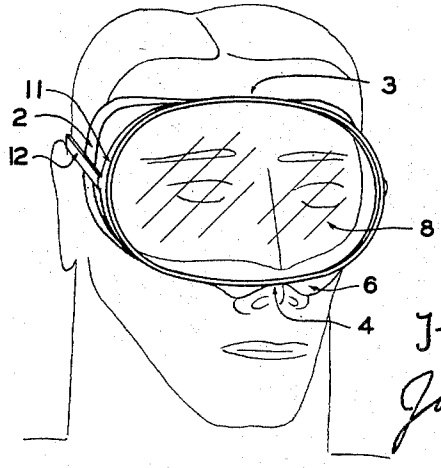
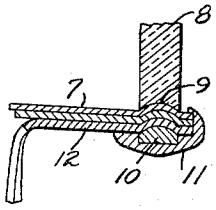


FIG. 6



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UNDERWATER GOGGLE

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3 Claims. (Cl. 2—14)

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This invention relates to improvements in diving masks or goggles designed to facilitate clear underwater vision.

The purpose of this invention is to provide an efficient underwater goggle, simple of manufacture, which is of such form that it will fit with water-tightness the contours of most faces without alteration or tailoring by the wearer.

A further purpose is to provide a mask which by virtue of its design and flexibility may be worn across or below the nose of the diver with equal water-tight integrity.

With the above general objects in view, the value of my improvement will be comprehended from the succeeding description and claims when read in connection with the accompanying drawings.

In the drawings:

Figure 1 is a perspective view of the improved underwater goggles being worn with the lower edge between the nose and upper lip, thereby completely encompassing the space in front of the eyes and nose of the wearer.

Figure 2 is a perspective view similar to Fig. 1 except that the lower edge of the goggle is fitted across the nose providing the wearer complete respiratory facilities through the nose.

Figure 3 is a plan view of the goggles.

Figure 4 is a side view thereof in elevation.

Figure 5 is an enlarged fragment in section taken on the line 5—5 of Fig. 3.

Fig. 6 is a transverse section of the goggles on an enlarged scale taken substantially on the line 6—6 of Fig. 4, looking in the direction indicated by the arrows, and showing the construction whereby the ends of the retaining straps are secured to the forward portion of the goggles.

The goggles are formed of a comparatively thin sheet material of such flexibility that it requires the support of a substantially rigid pane of transparent material to maintain its form at and in close proximity to the circumference of the pane.

Referring to the drawings, the wall of the goggles is cut from sheet material such as a rubber-cloth ply in such a design that when it is cemented into a tubular form and fitted around the form sustaining front pane, it will fit the contours of the average face. Inasmuch as the facial contours of individuals vary so much, maximum flexibility of all walls adjacent the face contacting parts and all wall edges contacting the face is necessary if a genuinely water-tight fit is to be obtained. This required flexibility is obtained by using comparatively

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thin material and feathering and stepping all edges 2 contacting the face of the wearer.

Feathering contemplates a free edge that tapers in cross section gradually to its termination. Stepping contemplates a cross section of taper of a free edge of material usually of a multiple ply construction. The stepping consists in cutting away one layer of laminated material after another in spaced relation until the terminal free edge comprises a singly ply only. For the purposes of this application feathering and feathered are deemed to be the generic terms contemplating tapering gradually to a thin flexible edge, while stepping and stepped are deemed to be specific terms and contemplate the use of laminated sheet material.

The top rear edge of the wall 3 is curved to fit the brow of the wearer. The lower edge is notched deeply as clearly shown on the drawings and is flanked by a pair of flexible flaps 6 thereby providing means whereby the goggle may be worn across the bridge of the nose as in Fig. 2. The extreme flexibility of the wall and the feather edge enables the flaps 6 forming the notch 4 to close in around the nostrils and the cheeks to give a water-tight fit. This feature provides for respiration through the nose when the lower edge is worn across the nose. When the mask is worn below the nose, as in Fig. 1, the flaps 6 fold down against the upper lip of the wearer. This mask therefore may be worn with equal water-tight integrity across or below the nose, depending on the fancy of the wearer.

The flexible wall 7 is beaded at its front inside edge to be received by the grooved edge of the circumferential edge of the transparent pane 8. The pane 8 maintains the form of the flexible wall at the juncture of the wall with the pane and adjacent thereto. The two parts are held together by the elastic tension of the wall which must be stretched to provide for the insertion of the pane. The edge of the pane 8 is provided with the groove 9 and accommodates a metal band 10 rounded in cross section to securely bind the wall 7 to the grooved pane 8. The forward end of the wall may be finished with a tape covering 11 thereby giving the forward portion of the goggles the appearance of a beaded finish.

A headband 12 is provided to hold the goggles firmly against the face of the wearer. This headband 12 may have an adjusting buckle (not shown). The band is attached to the forward end of the goggles by suitable means. As shown, the band is cemented to the wall and lies be-

tween the metal band 10 and the wall 7, so that it is securely held in place. Since the band is secured to the wall adjacent to the transparent pane, this rigid piece comprising the pane 8 distributes the headband tension substantially equally over all the rear wall portions including the flexible stepped and feathered edges thereof thereby maintaining a water-tight contact even against unusual facial contours. When the wearer of the goggles is in the water the water pressure forces laterally the stepped and free edge and adjacent wall portions against the face of the wearer of the goggles.

What I claim is:

1. A goggle providing for clear under-water vision for a diver, comprising a substantially rigid flat transparent pane, said pane having a rounded edge contour in combination with a wall of comparative thin sheet material of such flexibility so as to require the support of the rigid transparent pane to maintain its form at and in close proximity to the circumference of said pane, the forward edge portion of said wall being fixedly secured to said pane, said wall being disposable against the face of the diver to give a watertight fit, the rear trailing edge of said wall being feathered to provide for lateral flexure of its free edge, the wall portions adjacent the free edge being laterally flexible and responsive to lateral pressure, the upper rear edge of said wall being curved to yieldably fit against the brow and the lower edge being deeply notched and being flanked by flexible flaps so that the goggle may be worn either across the nose of the diver or below the nose, in one case encompassing the eyes but not the nostrils of the diver, thus providing for nasal respiration while wearing the mask, and in the second case encompassing both the eyes and nose of the wearer in a watertight compartment.

2. An underwater goggle construction comprising a wall structure of multiple ply waterproof sheet material of such thinness and flexibility as to require support from within to prevent the collapsing thereof, said sheet material being disposed in tubular form and having a front edge portion in a common plane and a rear trailing edge portion cut to conform to the head and facial contour of the wearer, in combination with a substantially rigid flat pane of transparent material disposed within the front edge portion of the tubular form and fixedly secured thereto, said rigid pane constituting an internal support for the front portion of the tube to prevent collapsing of the forward portion thereof, the flat pane being provided on its circumferential edge with a groove, the front inside portion of the tube being provided with a beaded edge received in the grooved edge of the pane, in further combination with means engaging the forward edge of said tube to firmly and securely unite the tube and pane in a leak-proof condition, the trailing edge of said tube having its outer ply of the multiple ply sheet cut away, to thereby constitute a stepped trailing edge which readily yields to lateral pressure to form a sealing contact with the head and facial contour of the diver wearing the goggles, said thin flexible material being laterally yieldable adjacent its trailing edge and responsive to lateral pressure, means on said goggles attached to the forward edge thereof and adapted to engage the head of the wearer to aid in maintaining the goggles in position on the wearer while in use.

3. An underwater goggle construction comprising a wall structure of multiple ply waterproof sheet material of such thinness and flexibility as to require internal support to prevent collapsing thereof, said sheet material being disposed in tubular form having a front edge portion in a plane substantially at right angles to the axis of the tube and a trailing free edge portion, said trailing edge portion being cut to substantially conform to the head and facial contour of the wearer, in combination with a pane of transparent substantially rigid material disposed within the front edge portion of the tubular form and constituting an internal support for the front portion of the tubular form to prevent collapsing of the forward portion thereof, in further combination with sealing means connecting said pane and said tubular form to provide a leak-proof joint, said rear edge of said tubular form having its outer ply of the multiple ply sheet material cut away to constitute a stepped trailing rear edge which readily yields to lateral pressure, the portions forward of but adjacent the trailing rear edge being laterally flexible and responsive to lateral pressure thereby forming a sealing contact with the head and facial contour of the diver, means on said goggles attached to the forward portion thereof and adapted to engage the head of the diver to aid in maintaining the goggles in position.

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