Nov. 6, 1945. H. M. DITTO 2,388,635

GOGGLES

Filed Dec. 15, 1942

Fig. 1.

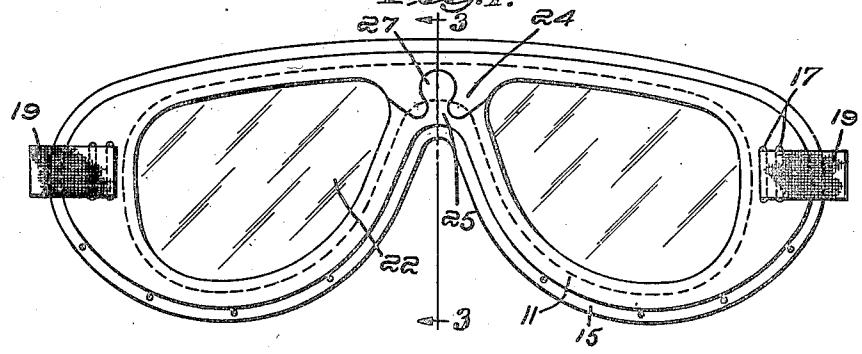


Fig. 2.

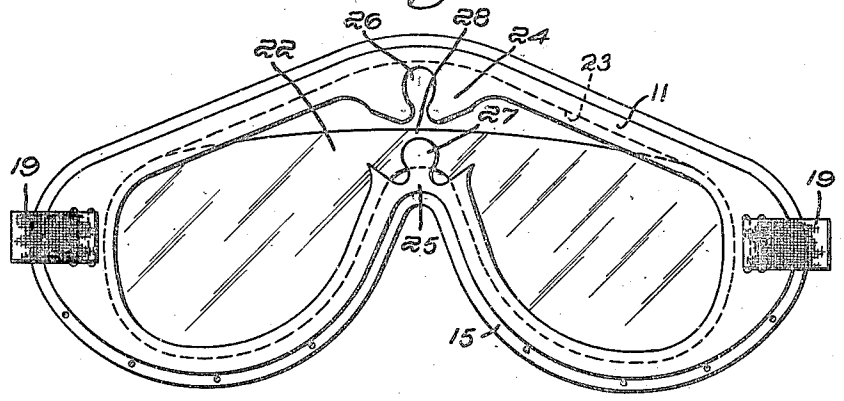


Fig. 4.

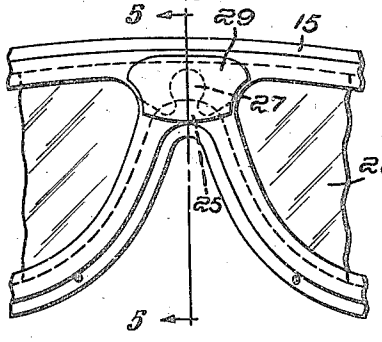


Fig. 3.

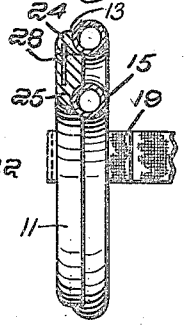
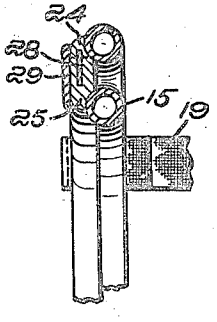


Fig. 5.



Inventor:
Hugo M. Ditto,
by Thomson & Thomson
Attorneys

Patented Nov. 6, 1945 2,388,635

UNITED STATES PATENT OFFICE

2,388,635

GOGGLE

Hugo M. Ditto, Newton, Mass., assignor, by mesne assignments, to Marine Optical Mfg. Co., Boston, Mass., a partnership composed of Arthur Ditto, Hugo M. Ditto, and Eugene D. Ditto

Application December 15, 1942, Serial No. 469,136

4 Claims. (Cl. 2—14)

This invention relates to goggles and pertains more particularly to improvements in plastic-framed goggles of the wind, glare and dust-proof type used by aviators, vehicle drivers, industrial or defense workers, and the armed forces, as well as for skiing, and other outdoor sports.

The principal object of the invention is to provide a durable, efficient and economical, all-purpose goggle which will withstand abuse without injury, which has a fully flexible frame adapted closely to conform to the face of the wearer without discomfort, and which affords a wide angle of vision without sacrifice of protection or compactness.

Further objects of the invention are to equip the margin of the goggle frame with a cushioning rim of soft plastic substance which absorbs excessive pressure or shocks of impact; to furnish a tubular rim having ventilating apertures so arranged as to ensure adequate draft and thus prevent fogging of the lenses; to ensure the easy application and replacement of removable lenses; and to provide a deformable frame which is separably connected at the nose bridge, so that a one-piece, plastic lens may be quickly removed and replaced whenever necessary or desirable.

The improved goggle is held in place by any suitable head strap adjustably connected to the ends of the frame; and it will be observed that the use of rubber, metal, or glass may be entirely avoided.

Recommended embodiments of the invention are shown in the accompanying drawing, in which:

Fig. 1 is a front elevation of the preferred form of the frame which affords a separable connection between the opposite sides of the frame at the bridge thereof;

Fig. 2 is another view of the goggle of Fig. 1 with the bridge separated to permit quick removal of the one-piece lens;

Fig. 3 is a section on line 3—3 of Fig. 1; and

Figs. 4 and 5 are detail elevational and sectional views of the separable nose bridge, showing an optional flap covering the separable joint, Fig. 5 being taken on line 5—5 of Fig. 4.

The goggle frame and its tubular cushioning rim are preferably made of a soft, flexible and resilient plastic such as polyvinyl butyral. This material is produced in varying thicknesses and densities and its flexibility will depend upon these factors and also, to some extent, upon temperature conditions. A frame having a thickness of approximately .375 inch and a cushioning tube having a wall thickness of approximately .075 inch has been found generally satisfactory for the temperate zones; and experimentation with other grades and thicknesses will indicate the most desirable material for hotter or colder climes. The assembled frame should be readily deformable to fit the contours of the face, and the cushion should yield under pressure or impact, without collapsing. The frame and rim may be united by a suitable solvent, such as denatured alcohol, or by an adhesive cement.

The lenses or eyepieces of the goggle are preferably made of cellulose acetate or other plastic having reasonable flexibility and being non-inflammable and non-shatterable, but relatively rigid glass lenses may be used, if that material is desirable and available. A single flexible lens removably fits within grooves of the frame as hereinafter explained.

The head strap for supporting the goggles against the face may be of fabric, leather or of plastic material, as desired; and each of the frame ends are preferably provided with a pair of slots in which the strap ends are adjustably retained.

The inner side of the frame 11 has a marginal channel 13, preferably curved in cross-section, receiving the tubular cushioning rim 15 which is secured therein in the manner previously described, so that the cushion projects rearwardly of the frame and serves to space the lenses from the eyes of the wearer to avoid contact of the eyelashes therewith, as well as to provide a self-conforming, cushioned seal between the face and the shaped goggle as a whole.

The end portions of the frame 11 have parallel slots 17, through which the respective ends 19 of the head strap are adjustably threaded. A one-piece lens 22 fits in a continuous groove 23 of the frame, and may be removed and replaced by spreading the upper and lower sides of the frame 11 (Fig. 2).

In order to avoid accidental displacement of the lens and to strengthen the frame at the nose bridge, a separably connected bridging member is preferably provided at the central portion of the frame. The bridge parts 24 and 25 are formed with an interlocking slot 26 and tongue 27, respectively, which may be pressed to locking engagement or pulled apart with little effort. Each of the members 24 and 25 is centrally slotted to receive and embrace the narrow center portion 28 of the one-piece lens 22, as indicated in Fig. 3. When the frame sides are separated at the joint (Fig. 2), the lens may be quickly and easily removed and replaced, and it will be se-

cured in position by locking the bridge parts together (Fig. 1). It will be understood that the soft plastic bridge members yield readily under pressure, so that the bifurcated tongue **27** may be slid endwise through the relatively narrow entrance to the groove **26**.

If curvature of the goggle tends to cause the bridge joint to spread or gape, a cover tab **29** may be disposed over the joint, as shown in Figs. 4 and 5. This tab consists of a small flat piece of the soft plastic, and is cemented or otherwise secured to the outer face of the bridge part **24** so that its flap portion depends, as an apron over the separable joint. The cover tab is ornamental as well as useful, and also supplies space for a trade-mark or other mark of identification which may be applied thereto before the tab is attached to the frame.

A pair of goggles constructed as herein described will withstand abuse without loss of utility, for they may be dropped, crushed or subjected to blows which would shatter or permanently damage a frame of rigid or less flexible plastic material. The goggle is, as aforesaid, freely conformable to the face of the wearer and may be bent, curved or twisted by hand so that the yielding rim fits snugly against the face and acts as a wind and dust seal when the adjusted head strap is applied by the wearer. Suitably colored lenses will also serve as glare shields.

The frame of the goggles may be readily stamped from sheet stock of polyvinyl butyral or other plastic or synthetic material of appropriate grade and thickness and having similar properties, to provide a single elongated lens opening; and the lens grooves, rim channel and strap slots are easily formed by simple tooling operations. The frame may also be molded by injection, compression or other known molding processes, if preferred. If desired, the sides of the lens-receiving grooves may be beveled or tapered to permit ease of application and removal of the lenses; and it will be appreciated that critical cutting to precise dimensions is not required in forming these grooves or the rim channels, because the soft and yielding character of the frame material will ensure conformation to the lenses and the tubular rim as well as to the face of the wearer.

I claim:

1. Goggles of the character described, comprising a frame of flexible plastic material conformable to the face of the wearer, the frame having a single opening for a one-piece lens and a groove extending around the opening to receive the periphery of said lens, a flexible lens removably retained in said groove, the top and bottom sides of the frame having separably interlocking bridge members embracing the central portion of the lens to strengthen the frame and hold the lens in position, a cushioning tube of compressible material secured to the outer margin of the frame and projecting rearwardly thereof, and a head strap connected to the ends of the frame for supporting the goggles against the face.

2. Goggles of the character described, comprising a frame of flexible plastic material conformable to the face of the wearer, the frame having a single opening for a one-piece lens and a groove extending around the opening to receive the periphery of said lens, a flexible lens removably retained in said groove, the top and bottom sides of the frame having separably interlocking bridge members embracing the central portion of the lens, to strengthen the frame and hold the lens in position, and a head strap connected to the ends of the frame for supporting the goggles against the face.

3. Goggles of the character described, comprising a frame of flexible plastic material conformable to the face of the wearer, the frame having an opening for a one-piece lens and a groove extending around the opening to receive the periphery of said lens, a flexible lens removably retained in said groove, the top and bottom sides of the frame having separably interlocking bridge members embracing the central portion of the lens to strengthen the frame and hold the lens in position, a cover tab secured to the front of one of said bridge members and overlapping the separable joint between said members, and a head strap connected to the ends of the frame for supporting the goggles against the face.

4. Goggles of the character described, comprising a frame of soft and flexible material conformable to the face of the wearer, the frame having a lens opening, a flexible lens removably retained in said opening, the top and bottom sides of the frame having separably interlocking bridge members embracing the central portion of the lens to strengthen the frame and removably hold the lens in position, the rear of the frame having a peripheral channel, a tubular cushioning rim of soft, compressible material secured in said channel, and means for supporting the goggles with the rim conforming to the contour of the wearer's face.

HUGO M. DITTO.