July 4, 1933. E. B. MEYROWITZ 1,916,628

GOGGLES

Filed March 21, 1929

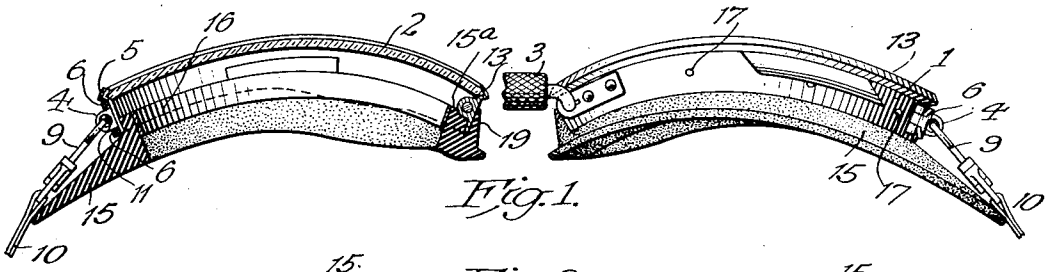


Fig. 1.

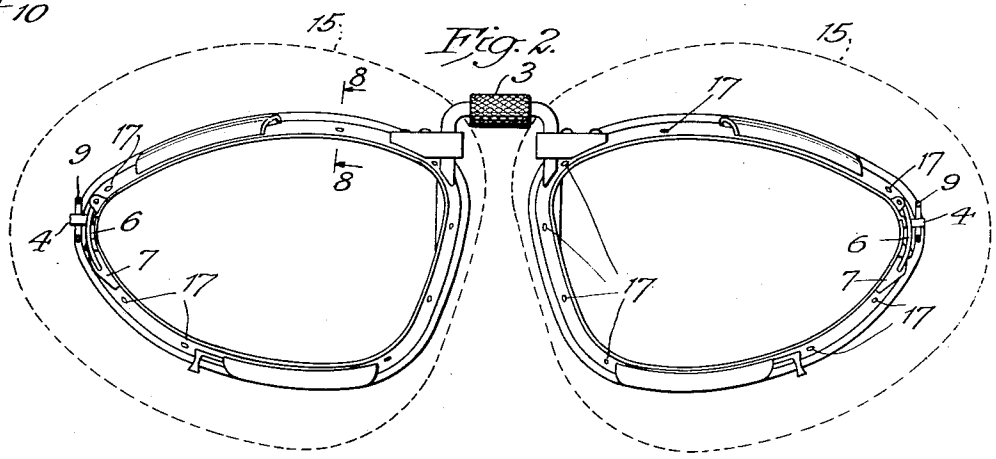


Fig. 2.

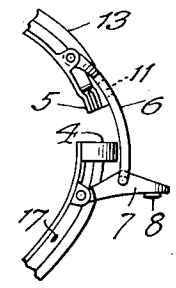


Fig. 3.

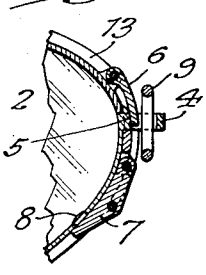


Fig. 4.

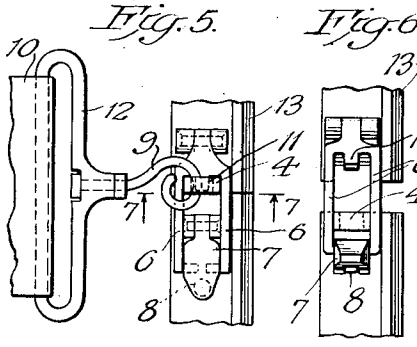


Fig. 5.

Fig. 6.

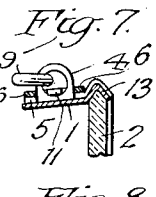


Fig. 7.

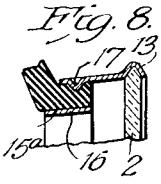


Fig. 8.

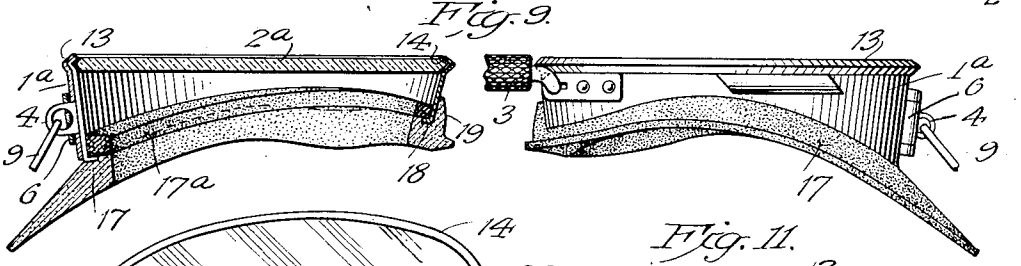


Fig. 9.

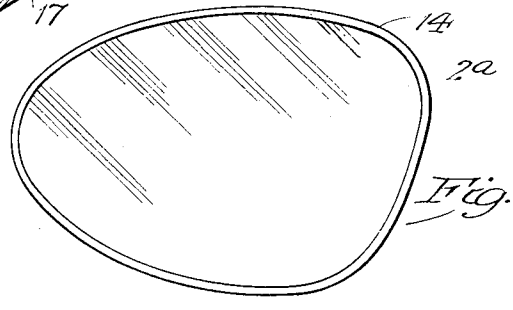


Fig. 10.

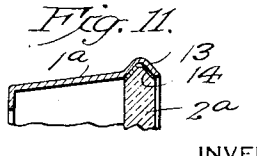


Fig. 11.

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UNITED STATES PATENT OFFICE

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GOGGLES

Application filed March 21, 1929. Serial No. 348,851.

This invention is especially serviceable in aviation and other uses in which goggles are subjected to heavy wind pressure. In certain particulars the invention has its chief application to goggles having eye cups which open up at one transverse joint and flex in their own plane to open and closed positions to release and secure the lenses. One object of the invention is to provide locking means for such eye cups which will be convenient to operate both to open and close the eye cups and which will be reliable in its function. Another object is to provide dependable means in conjunction with the opening and closing means which will enlist the cooperation of the head band attachment to hold the closing means securely in locked position. Another object is to provide a novel and improved form of head band attachment which will be convenient to connect and disconnect, while being secure against accidental release. Another object is the elimination of seepage of air around the edge of the lens. Another object is to provide an improved form of cushion which will be particularly serviceable and suitable for application with the type of eye cups above referred to. Still other objects and advantages of my invention will appear from the following description.

The locking structure for the eye cups as contemplated by my invention comprehends a modified type of toggle arrangement which serves by its operation both to open the eye cup so as to admit or release a lens, and to draw it shut and lock it against accidental opening. In a form which I have found entirely acceptable the catch or hook on the head band engages in the attaching eye in such relation to the locking elements as to prevent the breaking of the toggle with the consequent opening of the joint while the head band is attached. For security as well as convenience in attachment of the head band and avoidance of twisting it, I make the hook in convolute form and provide it with a swivel joint.

I have found that the seepage of air around the edge of the lenses can be minimized, and with sufficient care entirely eliminated, by making the bezel or lens-retaining groove in the eye cup of V-shape in cross section and grinding the lens to a corresponding edge. My invention accordingly contemplates this shape for these elements. To avoid the necessity for extreme accuracy in edging the lens to obtain the required exactness of fit, my invention contemplates an individual rim for each lens which is secured to the lens in such a manner as to be proof against leakage of air, and which by suitable die work may be made to fit the bezel exactly or may be of such material as to conform readily to the precise shape of the bezel.

Another phase of my invention relates to the construction of cushion and mode of securing it in eye cups which are jointed to open and close in their own plane. A lip which protrudes forwardly from the body of the cushion and fits within the eye cup is reinforced so as to be substantially non-deformable and the parts are so shaped as to interengage when the cup is closed while permitting ready insertion of the lip when the cup is open. For example, if the lip is of soft rubber like the body, it may be reinforced by an internal metallic band which I have found may be vulcanized to the face of the lip, and the inner face of the cup may have upstanding sharp points which will pierce the outer face of the lip when the cup is closed. Alternatively, the lip may be of hard rubber vulcanized to the soft rubber body and have an overhang to interengage with a flange on the cup.

My invention also contemplates other features of construction and details and arrangements of parts as will hereinafter more fully appear.

I shall now describe the illustrated embodiments of my invention and shall thereafter point out my invention in claims:

Fig. 1 is a top plan of a pair of goggles embodying my invention, the left goggle being in section;

Fig. 2 is an elevation of the same as viewed from the inner or face side;

Fig. 3 is an enlarged detail of a portion of the right eye cup in elevation showing the joint and the associated parts in open position;

Fig. 4 is a central circumferential sectional elevation of the same, but in closed position;

Fig. 5 is an end elevation of the same in closed position with the end of the head band and its attaching parts shown attached to the eye cup;

Fig. 6 is an end elevation of the jointed end of the eye cup with the parts in open position;

Fig. 7 is a transverse section on line 7—7 of Fig. 5;

Fig. 8 is a transverse section on line 8—8 of Fig. 2;

Fig. 9 is a top plan of a pair of goggles constituting a somewhat modified embodiment of my invention, the left goggle being in section and the eye cups being of the so-called flat type as distinguished from the curved or meniscus type of Fig. 1;

Fig. 10 is a detail in plan of the lens with its individual rim, as incorporated in the construction of Fig. 9;

Fig. 11 is a transverse section through one of the eye cups and associated parts of Fig. 9 but with the cushion omitted.

The locking means illustrated in the drawing is the same both for the curved eye cup 1 of Figs. 1 to 8, inclusive, which takes the meniscus lens 2, and for the flat eye cup 1*a* of Figs. 9 to 11, inclusive, which takes the flat lens 2*a*. The eye cup is of flexible sheet metal stock of substantial width and circumferentially has the usual approximately oval shape. The eye cup is composed of one continuous strip of metal which is jointed to open at the outer or temple end of the cup, being expansible and contractible in its own plane due to the flexibility of the metal. The two eye cups of the pair of goggles are coupled as usual by a bridge member 3 and are hinged upon the legs of the bridge in conformity with the construction in this regard which is disclosed and claimed in my copending application Serial No. 337,559, filed February 5, 1929. The ventilating means at the top and bottom of the eye cup are the same as those illustrated in my said copending application and form no part of the present invention.

The ends of the metal strip forming the body of the eye cup are made to overlap slightly in closed position. At the extremity of one end there is provided an upstanding eye member 4 into which the head band hooks, as will presently be described. The extremity of the other end 5 of the sheet metal strip is bifurcated and straddles the eye member 4 as it overlaps its companion when the eye cup is closed.

The opening and closing elements which also serve to lock the joint shut comprise two links that are pivoted respectively to the opposite ends of the metal strip forming the body of the eye cup, and are pivoted to each other, constituting in effect a modified form of toggle. They are so pivoted, however, that in closed position they overlap, both folding down in the same direction upon the face of the eye cup, the shorter or overlapped element having an extension beyond the point of pivotal connection with its companion, which extension serves as a finger piece to operate the mechanism. The link 6, which is pivoted to the bifurcated or overlapping end of the eye cup, is of sufficient length to extend considerably over the joint and in closed position lies against the face of the cap, overlapping the opposite end. To enable it to do this it is in the form of an open link so as to straddle the eye member 4. Specifically, it is a bifurcated member and has its two ends turned inwardly and pivotally attached to the operating link 7 which is pivoted to the opposite end of the eye cup wall beyond the eye member 4. This member 7 has the extension above referred to which serves as a finger piece, and is designed to fold down against the face of the eye cup, being provided at its free end on its under face with a projecting lug 8 which enters a hole in the wall of the eye cup when the parts are folded down to closed position.

The pivot for the member 7 is so located as to permit the two links to be folded down flat against the eye cup. Due to the connection between the two members, the raising of the member 7 serves to separate the two ends and open the eye cup at the joint, while the pivotal movement of the member 7 in the direction to fold it down against the eye cup serves to draw the two ends together. In this closed position, the link 6 overlaps the link 7 and the parts are folded slightly past the center line so that an expansive or opening strain on the eye cup serves to exert an inward pull upon the operating link 7 and thus pull the locking members more tightly against the face of the cup in locking position.

As a safeguard against the possibility of an accidental raising of the member 7 and consequent opening of the eye cup at the joint, means are provided which cause the hook 9 on the end of the head band 10 to hold the locking members against releasing movement while the hook 9 is engaged in the eye member 4. Specifically, the link member 6 has at the center of its base between the two arms of the bifurcation a projecting tongue 11 which in the closed position of the parts enters the eye member 4. In the movement of the parts to open the eye cup this tongue 11 has a considerable outward or upward component of movement in addition to the backward or receding movement. The hook 9 in the eye member 4 holds the tongue 11 against raising and it is, therefore, impossible to swing the operating link member 7 upwardly to open the parts due to the engagement of the tongue 11 against the hook 4. Hence, when it is desired to open the eye cup, it is necessary first to unhook the head band.

In the head band construction shown, the hook 9 is of convolute form. This form of hook is calculated to prevent any accidental detachment of the head band. However, it requires the turning of the end of the head band in a complete circle around the eye after the end of the hook is entered in the eye in order to effect the engagement of the hook. To avoid a twisting of the head band during such manœuvre as well as to enable the wearer to remove any twist from the head band, the hook has a swivel connection. Specifically, the end of the head band is attached to a metallic loop 12, the hook 9 being swiveled to this loop.

The eye cup at its front edge is provided with a circumferential lens-retaining groove or bezel 13. As above explained, in order to eliminate seepage of air past the edge of the lens 2, this bezel is of V-shape in cross section and the edge of the lens is correspondingly shaped. The contraction of the size of the eye cup in its closing movement draws the walls of the bezel tightly over the edge of the lens and due to the shape of the parts any slight inaccuracies in the fit will be compensated for since slight variations from the extent to which the edge is entered into the groove will not affect the tightness of the fit.

In the construction shown in Figs. 9, 10 and 11, the lens has still further provision made against seepage of air past its edge due to possible inaccuracies in the grinding of the edge of the lens. In this construction the lens 2*a* has its own individual rim 14. This rim may be formed in various ways and of various materials. It may, for example, be pliable sheet metal shaped with suitable tools in engagement upon the beveled edge of the lens; or it may be formed from steel or from shell or other material which will require complete formation prior to its application to the edge of the lens. In the latter case its external size can be determined with extreme accuracy so that its fit into the groove of the eye cup will be absolutely tight; while in the former case it is of such a nature as to adapt itself to the groove. In either case the lens with its individual rim will constitute a separate article of manufacture and will insure a tight fit into the eye cup without the necessity of extreme accuracy in the size of the lens around its entire periphery.

The cushion shown in Figs. 1, 2 and 8 has the usual soft rubber body 15 which is shaped to the contour of the face and has a lip 15*a* projecting from its outer face and fitting into the eye cup 1. The lip in this case is of the same composition as the body and is reinforced against deformation by an internal metallic band 16 which is vulcanized or otherwise secured to its inner face. The eye cup has about its inner face several inwardly directed sharp points 17 which in the construction shown are formed by pressing in the metal of the eye cup. These sharp points 17 prick into the outer face of the lip 15*a* when the eye cup is closed around it and the cushion is thereby secured to the eye cup.

In the construction of cushion shown in Fig. 9, the body 17 of the cushion is of soft sponge rubber while the lip 17*a* is of hard rubber that is vulcanized to the body of the cushion. This lip 17*a* is shaped to provide an overhang and forms an outwardly open retaining groove within which an inwardly turned flange 18 on the inner edge of the eye cup engages when the eye cup is closed. When the eye cup is open the lip 17*a* is readily inserted past the inturned flange 18. As in the construction of my copending application Serial No. 318,357, filed November 10, 1928, the cushion in both instances has a short flap 19 on the nasal end to form an extra cushion for the nose.

It is obvious that various modifications may be made in the constructions shown in the drawing and above particularly described within the principle and scope of my invention.

I claim:

1. As a frame member for goggles, an eye cup jointed to open transversely at one point, and locking means at the joint comprising two operatively connected links, one pivoted to the eye cup at one side of the joint and being of a length substantially to overlap the eye cup at the other side of the joint, and the other being pivoted to the eye cup at the other side of the joint between the joint and the overlapping end of the first link at such point as to permit the two links to be folded compactly against the face of the eye cup.

2. As a frame member for goggles, an eye cup jointed to open transversely at one point, and locking means at the joint comprising two pivotally connected links, one pivoted to the eye cup at one side of the joint and being of a length substantially to overlap the eye cup at the other side of the joint, and the other being pivoted to the eye cup at the other side of the joint between the joint and the overlapping end of the first link at such point as to permit the two links to be folded compactly against the face of the eye cup, an eye member at the joint on the said overlapped end of the eye cup, and a tongue piece on the overlapping link arranged to enter the eye member as the links are folded down to close the eye cup.

3. As a frame member for goggles an eye cup jointed to open transversely at one point, and locking means at the joint comprising an open link member pivoted to one end of the eye cup body and adapted substantially to overlap the other end, an eye upstanding on the other end of the eye cup body in position to be straddled by the open link, a

tongue on the link adapted to enter the eye as the link is folded down, and an operating member pivotally connected to the overlapping end of the link and pivoted to the said other end of the eye cup body beyond the said upstanding eye.

4. Goggles including an eye cup jointed to open transversely at one point, and locking means at the joint comprising an open link member pivoted to one end of the eye cup body and adapted substantially to overlap the other end, an eye upstanding on the other end of the eye cup body in position to be straddled by the open link, a tongue on the link adapted to enter the eye as the link is folded down, an operating member pivotally connected to the overlapping end of the link and pivoted to the said other end of the eye cup body beyond the said upstanding eye and a head band having a hook engaging in the eye on the outer side of said tongue and restraining the tongue from sufficient outward movement to escape from the eye and permit the cup to open while the hook is in said eye.

5. A goggle member comprising an eye cup having pointed projections about its inner face, and a soft rubber cushion for the inner edge of the cup having an outwardly projecting lip fitting within the eye cup and impaled upon said points.

6. A goggle member comprising an eye cup having pointed projections about its inner face, and a soft rubber cushion for the inner edge of the cup having an outwardly projecting lip fitting within the eye cup and impaled upon said points and having a reinforcing backing band attached to the inner face of the lip.

7. A goggle member comprising an eye cup of flexible material transversely jointed at one point to expand and contract in its own plane and having pointed projections about its inner face, and a soft rubber cushion for the inner edge of the cup having an outwardly projecting lip fitting within the eye cup and impaled upon said points and having a reinforcing backing band attached to the inner face of the lip.

8. A goggle member comprising an eye cup of flexible material transversely jointed at one point to expand and contract in its own plane and having cushion retaining means about its inner face, and a soft rubber cushion for the inner edge of the cup having a relatively inflexible lip fitting within the cup and adapted to be entered therein when the eye cup is expanded and to be locked by the retaining means when the eye cup is contracted.

In witness whereof, I hereunto subscribe my signature.

EMIL B. MEYROWITZ.