Dec. 29, 1931. N. M. BAKER 1,838,649

EYE PROTECTOR

Filed March 1, 1930

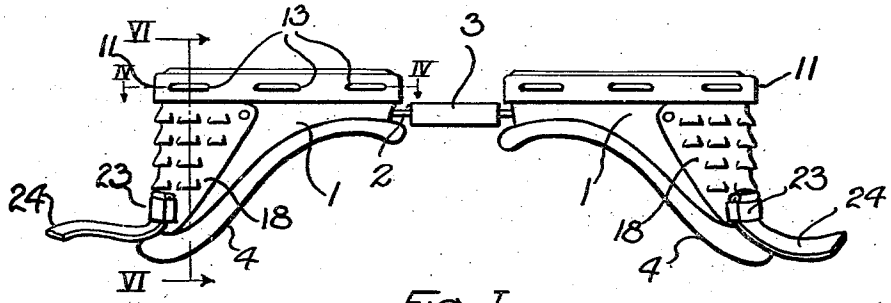


FIG. I

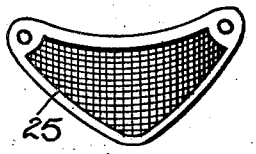


FIG. VII

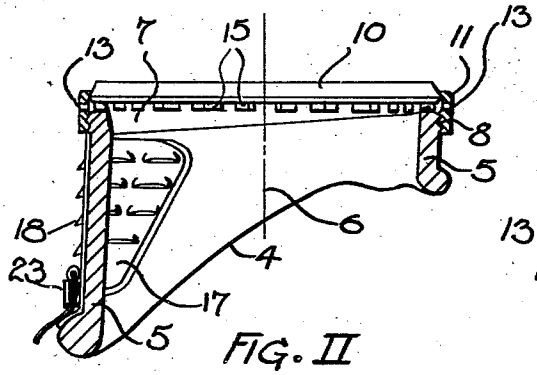


FIG. II

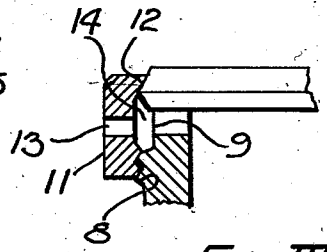


FIG. III

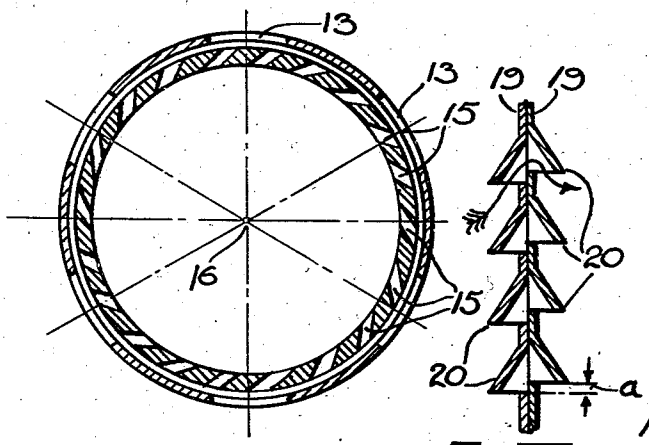


FIG. IV

FIG. VI

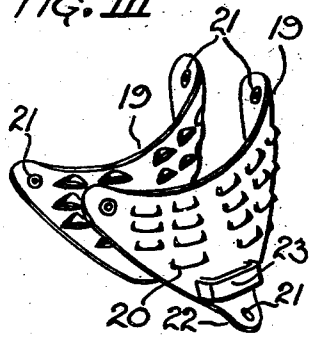


FIG. V

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EYE PROTECTOR

Application filed March 1, 1930. Serial No. 432,450.

This invention relates to improvements in eye-protectors and has particular reference to an improved form of ventilating means for use therein.

The principal object of this invention is to provide free and abundant ventilation in an eye-protector while excluding dust, light and heat.

Another object of this invention is to provide means whereby eye-protectors fitting closely to the facial contour, particularly at the nasal side, may be ventilated as freely as those projecting away from the face for greater distances.

Another object of this invention is to provide said improved ventilation and light excluding means without adding baffle-plates or other parts which involve unnecessary expense and added weight to the eye-protector.

Another object of this invention is to provide means whereby single lenses of different thicknesses or a plurality of lenses may be held with equal facility without disturbing the ventilating stream. Another object of the invention is to provide improved means of ventilation wherein the air currents may circulate directly across the face of the lens to prevent the fogging and steaming thereof.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings and it will be understood that many changes may be made in the details of construction and arrangement of parts without departing from the spirit of the invention as expressed in the accompanying claims. I, therefore, do not wish to be limited to the exact details shown and described as the preferred forms only have been shown by way of illustration.

In the drawings:—

Fig. I is a front elevation of a pair of eye-protectors embodying the invention.

Fig. II is an enlarged central longitudinal section through one of the eyecups thereof.

Fig. III is a fragmentary enlarged view of a portion of the eyecup shown in Fig. II.

Fig. IV is a section taken on line IV—IV of Fig. I.

Fig. V is a perspective view of the temporal ventilating means showing the parts separated.

Fig. VI is an enlarged partial sectional view taken on line VI—VI of Fig. I.

Fig. VII is a front view of a modification.

In various industrial occupations where the operatives are subjected to the hazards of intense light, heat and flying particles it is necessary that the eyes should be carefully shielded. Eye-protectors of various construction have been utilized for this purpose, but all have been more or less unsatisfactory, for various reasons, but chiefly because of inadequate and poorly arranged ventilation.

The generally accepted theory of industial goggle ventilation is that air will enter the nasal side and exhaust at the temporal side after travelling across the interior of the eyecups. It will readily be seen that as the nasal side of each eyecup rests against the wearer's nose and is much shorter than the temporal side, very little air is able to enter the usual eyecup having apertures in its nasal side. This difficulty has given rise to much discomfort to the wearers of eye-protectors and in my invention I have taken cognizance of this and provided means whereby ample quantities of air will be permitted to enter the eyecup at the nasal side notwithstanding the close contact thereof with the wearer's nose.

In prior art eye protectors the air for ventilation has usually been admitted and exhausted through the eyecup at a point intermediate the facial contact edge and the inner surface of the lens. It has been found from experience that with this construction there is a great tendency of the lenses to steam and fog owing to the difference in temperature between the inside of the eyecup and the outside thereof. In my invention means have been provided by which the air currents are brought into and exhausted from the eyecup so that the air may circulate directly across the surface of the lens to maintain a substantially equal temperature on the two sides of the lens and thus prevent this fogging and steaming.

Together with the improvement, in the ventilation of industrial eye-protectors I

have provided improved means of excluding undesired light-rays which are encountered in welding the furnace work. One of the major disadvantages of prior art eye-protectors was that when a better ventilation was created it was often at the expense of admitting light to the wearer's eyes and so detracting wholly from the value of the article as an eye-protector.

It is the prime object of this invention, therefore, to provide an improved construction for an eye-protector embodying adequate ventilation without sacrifice of the light-excluding properties.

Referring to the drawings wherein the preferred embodiment of the invention is shown for the purpose of illustration the numeral 1 denotes the cup portions of the eye-protector which are connected by means of a chain 2 having a suitable flexible covering 3 constituting a bridge portion.

The eyecups 1 are preferably shaped with a face-contacting portion 4 which fits snugly to the facial contour and the sides 5 of the cups are also slightly angled with the center line 6 to cause convergence when upon the face and allow a wide angle of vision. A cone-shaped portion 7 at the upper end of the eyecups 1 also aids in widening the field of vision.

At the upper end of the eyecups 1 is a threaded portion 8 having the initial thread removed to form an undercut portion 9 as shown in Fig. III. A lens 10 or lenses of some light retarding glass may be placed upon the upper end of the eyecup 1 and held in position by the cap-member 11.

The novel construction of the ventilating means will now be apparent, inasmuch as I utilize the cap 11 itself as part of these means. In this regard it will readily be seen that the cap 11 is always free from obstruction at the nasal side being much farther from the face than the eyecup wall 5 which fits snugly against the nose.

The cap 11 is preferably threaded to fit the threaded portion 8 of the eyecup and has a tapered portion 12 fitting against a suitably bevelled edge on the lens 10. With this construction the lens 10 protrudes slightly beyound the cap 11 with either thick or thin lenses in position and among other advantages permits the lens to be wiped off easily and also permits flying particles to glance off its surface without breakage.

In utilizing the cap 11 for ventilating purposes I provide a series of apertures 13 preferably equally spaced around the side thereof communicating preferably at the junction of the taper 12 and the threaded portion where a suitable recess 14 is provided around the interior of the cap. This recess 14 will be opposite the undercut 9 of the eyecup 1 when the lens 10 and cap 11 are in position as shown in Fig. III and allow a circulation of air all around the eyecup between the said eyecup 1 and cap 11.

In order to allow this air to reach the interior of the eyecup I provide a series of slots 15 preferably all around the top of the eyecup, as shown in Fig. IV. These slots 15 are formed to sufficient depth to register with the apertures 13 in the cap 11 so that when the cap is screwed down with the lens 10 in position all of said apertures 13 will communicate with the slots 15 and allow ample air to enter the eyecup. It will be apparent from this construction that air may enter and circulate across the surface of the lens 10 and prevent the fogging or steaming thereof which has been a big factor in the inefficiency of prior art eyecups and detracted from their comfort. It will also be apparent that due to the angular dispostion of these slots 15 relative to the center 16 of the eyecup 1 as shown in Fig. IV no direct light can enter and reach the wearer's eye, but the rays will strike the sides of the slots and be directed away from the eyes. This feature is particularly valuable in welding operations where intense and injurious light rays are combined with considerable heat and it is imperative that operatives' eyes be protected from both. In my invention it will be seen that this has been accomplished so far at the nasal side and the entrance of ample air without injurious light is assured.

In the emission of the air at the temporal side similar considerations must be satisfied inasmuch as free passage for the air must be provided without the danger of light entering the eyecup. I have provided novel means of satisfying these requirements by forming a large opening 17 in the temporal wall of the eyecup 1 and placing thereover the shield member 18.

The shield member 18 is preferably formed of a pair of thin plates 19 of metal or other suitable material having a series of louvres 20 struck-up from their surfaces in opposite directions as shown in Fig. VI. One plate is made convex and the other concave in contour so that they may be secured one within the other by soldering or other suitable means. The plate 19 which is to be placed against the eyecup is preferably secured to its fellow with a slight difference in height between the edges of the registering louvres as shown by (*a*) in Fig. VI. In this manner I obtain the desired result of securing a free flow of air from the interior to the exterior of the eyecup 1 without admitting direct light-rays to the wearer's eyes as shown by the arrow in Fig. VI.

In securing the shield member to the eyecup I preferably form rivet holes 21 therein and in a tag portion 22 formed at the lower edge of the shield whereby the member may readily be secured to the eyecup by riveting or other securing means. I also preferably se-

cure a head-band holding member 23 to the outer plate member 19 of the shield and this member 23 may be formed of a rectangular strip of the same material used for the shield 18 and secured thereto by soldering or other suitable means. A headband 24 is secured in position by means of the said holding member 23.

In use the eye-protector is placed over the wearer's eyes in the usual manner and air will impinge on the front of the wearer's face and be deflected into the nasal ventilation apertures 13. After circulating across the eyecup and preventing overheating the wearer's eyes and fogging of the lenses 10 the air will pass out through the temporal ventilation means or louvres 20. No light will be able to enter at either the nasal or temporal side and only light which is properly filtered by the lens 10 will reach the wearer's eyes.

It will be apparent, however, that should this eye-protector be used in chipping or other occupation where the exclusion of light is not a factor in the construction I may utilize the nasal ventilating means described without using the temporal. I may for instance place a wire mesh screen 25 as shown in Fig. VIII or other prior art device over the temporal opening 17 to obtain quite unrestricted ventilation whilst utilizing the novel cap ventilation at the nasal side. In this manner my device may be employed for occupations requiring both light and heat protection and also those requiring only protection from flying particles.

From the foregoing it will be apparent that I have provided simple and economical means of ventilating eye-protectors both where light must be excluded and where this is not necessary. The entrance of air is not impeded by the close contact of the nasal side with the wearer's face and at all times a good flow of air will travel across the eyecup to the temporal side. It will also be apparent that this advantageous feature has been obtained without admitting injurious light-rays to the interior of the cup thus rendering this novel construction of wide application for industrial and other purposes.

Having described my invention, I claim:

1. In a device of the character described, a substantially annular eyecup having one end to fit the face and its other end scored across with a plurality of separated ventilation grooves extending from the outer to the inner surfaces thereof, and thread means on the outer surface adjacent the bottom of the grooves, a lens resting on top of the grooves and a cap member over the lens having thread means engaging the thread means on the eyecup and having transverse openings in substantial alignment with the grooves.

2. In a device of the character described a substantially annular eyecup having one end to fit the face and having the other end scored across with a plurality of ventilation grooves extending from the outer to the inner surfaces thereof, said grooves being open at the top, and thread means on the outer surface adjacent the bottom of the grooves, a lens resting on the grooved end and forming the top of the ventilation grooves, and a cap member over the lens having thread means engaging the thread means on the eyecup and having transverse openings in substantial alignment with the grooves.

3. In a device of the character described, a substantially annular eyecup having one end to fit the face, a plurality of ventilation openings adjacent the other end, thread means on the outer surface adjacent to and on the eye side of said openings, a lens resting on the eyecup on the end opposite from the face and a cap member over the lens having an unthreaded portion adjacent the outer end thereof, a plurality of openings adjacent said unthreaded portion, and a threaded portion adjacent the inner end thereof, said cap fitting over the lens and said thread means engaging the thread means on the eyecup and said openings being in substantial alignment with the openings in the eyecup.

4. In a device of the character described, a substantially annular eyecup having one end to fit the face, a plurality of ventilation openings adjacent the other end, and a threaded portion on the outer surface adjacent the ventilation openings, a lens resting on the outer end of the eyecup, said lens having a beveled edge and a cap member over the lens having a beveled portion to engage the beveled portion of the lens and an unthreaded portion adjacent the beveled portion and a plurality of transverse ventilation openings adjacent the unthreaded portion and a threaded portion between the inner end and the said openings the threaded portion of the cap engaging the threaded portion of the cup and adapted to lock the beveled portion of the cap against the beveled portion of the lens with the openings in the cap substantially in alignment with the transverse openings in the cup.

NELSON M. BAKER.