July 6, 1937. N. M. BAKER 2,085,844

EYE PROTECTOR

Filed Feb. 20, 1935

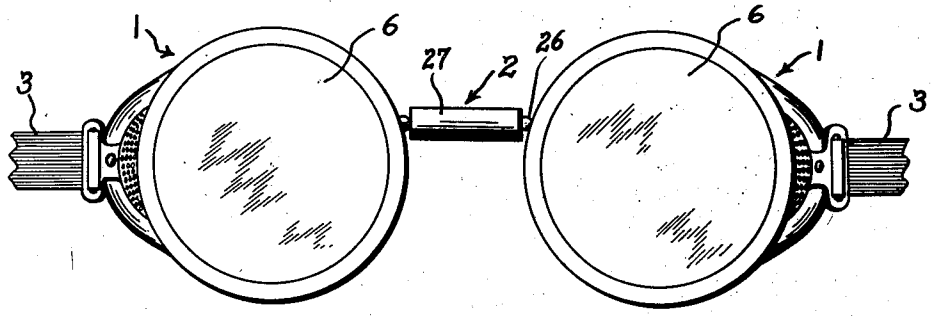


FIG. I

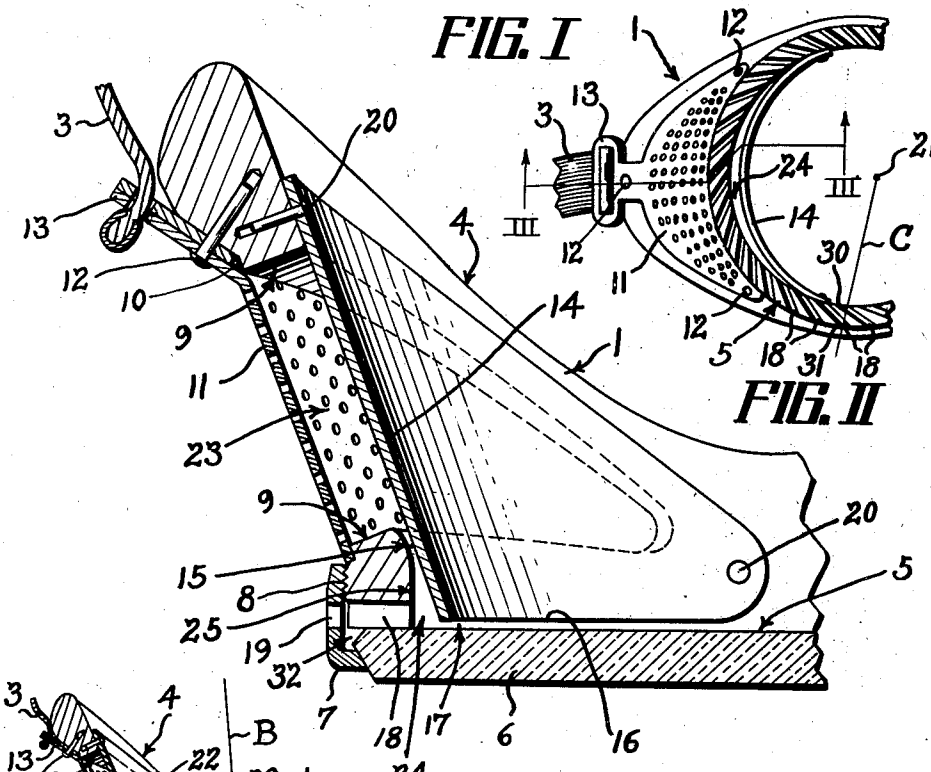


FIG. II

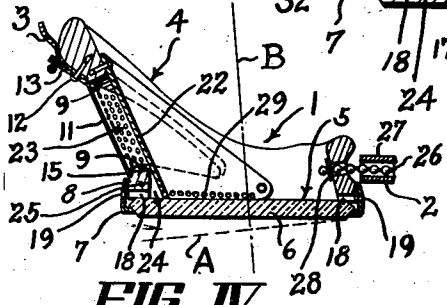


FIG. III

FIG. IV

INVENTOR
Nelson M. Baker
BY
Harry H. Stull
ATTORNEY

Patented July 6, 1937 2,085,844

UNITED STATES PATENT OFFICE

2,085,844

EYE PROTECTOR

Nelson M. Baker, Southbridge, Mass., assignor to American Optical Company, Southbridge, Mass., a voluntary association of Massachusetts

Application February 20, 1935, Serial No. 7,376

5 Claims. (Cl. 2—14)

This invention relates to improvements in eye protectors and has particular reference to an improved form of ventilating means therefor.

One of the principal objects of the invention is to provide an eye protector which will have exceptionally free and abundant ventilation and yet provide maximum protection for the eyes when exposed to liquid chemical splashes, dust, light, heat, etc. during use.

Another object is to provide an eye protector which will fit snugly and comfortably on the face along the face contacting portions thereof so as to exclude liquid chemical splashes, dust, light, heat etc. in that vicinity.

Another object is to provide improved means of ventilation wherein the air currents may circulate directly across the rear face of the lens to prevent the fogging and steaming thereof during use.

Another object is to provide indirect ventilating means at the sides and additional ventilating means adjacent the lens supporting edges of an eye protector of the above character which, should the ventilating means at the sides be penetrated by a splash of liquid, the said liquid will be deflected towards the lenses whereby it will flow outwardly of the eye protector through the ventilating means adjacent the lens supporting edges thereof.

Another object is to provide indirect ventilation at the sides and lens supporting edges of the eyecups of an eye protector whereby the ventilating stream through both the sides and lens supporting edges will be directed towards the rear surfaces of the lenses.

Another object is to provide an eye protector of the above character which may be worn for a long period of time without discomfort and which will allow a wide and normally increased angle of vision in all directions through the eyecups.

Another object is to provide an inexpensive eye protector which is light in weight and durable and which is adapted particularly for general use.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawing 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 drawing:

Fig. I is a front view of a pair of eye protectors embodying the invention;

Fig. II is a fragmentary plan view of an eyecup showing the ventilating means at the side and a portion of the ventilating means at the lens supporting edge of the eyecup;

Fig. III is an enlarged sectional view taken on line III—III of Fig. II; and

Fig. IV is a reduced view similar to Fig. III showing a slightly modified form of the invention.

In various industrial occupations and in laboratories where the operatives or persons conducting experiments etc. are subjected to the hazards of intense heat, light, flying particles and splashing liquid chemicals, etc. it is necessary that the eye should be carefully shielded. Eye protectors of various constructions have been devised and utilized for these purposes, but usually they have been more or less unsatisfactory, either because of inadequate and poorly arranged ventilation causing fogging and steaming of the lenses during use, or of the excessive weight of the eyecups and discomfort at the face contacting edges thereof or of restricted vision through the eyecups, or because of the chemical reacting, corrosive and nondurable nature of the materials used in forming such eye protectors.

It, therefore, is one of the primary objects of this invention to provide an eye protector which will be ideal from all of the above standpoints and which will provide free and abundant ventilation with maximum protection from all eye hazards, particularly that of splashing liquid chemicals etc.

Referring more particularly to the drawing wherein like characters of reference designate like parts throughout the several views, the eye protector or goggle embodying the invention comprises broadly a pair of eyecups 1 connected by a bridge member 2 and having a head band or other suitable means 3 for holding the eyecups in position before the eyes.

In forming the eyecups 1, I depart from the usual plain cylindrical shaped cups of the prior art type and mould or otherwise shape my eyecups of fiber or other suitable chemical or acid resisting and noncorrosive material. Each eyecup is provided with a face contacting edge 4 which is shaped to the general characteristics and to fit snugly and comfortably to the wearer's face about the orbit of each respective eye. A

lens supporting edge 5 is formed on the opposite or front side of each eyecup in close proximity with the face contact edge and during use is angled rearwardly relative to a plane A normal to the line B of straight ahead vision on both the temporal and lower sides. The inner side walls of each eyecup are also angled outwardly relative to the line B of straight ahead vision and in the direction of the lens supporting edge 5 as shown in Fig. IV. All of the above features provide means whereby the field of vision through the eyecups is greatly increased over prior art goggles of this nature.

The edges 4 are restricted in their face contacting area to prevent overheating the wearer's face during continued use but are so shaped that they are extremely comfortable. The snug fit of the edges 4 provide a positive seal of the eyecups with the face and prevent splashing liquids etc. entering the eyecups in this vicinity during use.

The lenses 6, which preferably are of the hardened type to resist impact, are supported and held on the lens supporting edges 5 of the eyecups by lens retaining rings 7 attached to the eyecups by the thread connections 8.

To provide ventilation the outer or temporal walls of the eyecups are cut away as indicated at 9 to form vent openings. These openings are each provided with an outer recessed shouldered edge 10 in which a perforated shield 11 is secured by rivets or other suitable means 12 with its outer surface flush with the outer surface of the eyecup. These shields are each provided on the sides thereof towards the face of the wearer with an integral perforated lip 13 to which the head band 3 is attached.

A solid baffle plate 14 is secured inwardly of each eyecup by rivets or other suitable means 20 with its rear edge and sides overlapping the edges of the side opening or cut out portion 9 as indicated in Fig. III. This baffle plate 14 is fitted and held in close contact with the inner walls of the eyecup along the rear and sides of the opening 9 by rivets or other suitable means 29 but is spaced from the inner wall of the eyecup at the front edge of the opening 9, as indicated at 15, to provide an air passageway towards the lens 6. The front edge 16 of each baffle plate 14, as indicated in Fig. III, is extended towards the rear surface of the lens 6 but is spaced slightly therefrom to provide an air passageway 17 inwardly of the eyecup. This arrangement provides means whereby the flow of air entering the perforations of the shield 11 will be directed by the baffle plate 14 through the space 15 and through the space 17 across the rear surface of the lens 6. The baffle plate 14, in addition to directing the flow of air completely isolates the eye from all eye hazards such as chemical splash, light, dust, etc.

To provide additional ventilation and to insure against the fogging and steaming of the lenses during use, the lens supporting edge 5, as shown in Figures II and III, is provided with a plurality of slots 18 preferably formed all around the said edge. These slots are formed to a sufficient depth to register with a plurality of vent apertures 19 formed in the lens retaining ring 7 so that the flow of air entering the apertures will circulate across the rear face of the lens 6. This ventilation, in addition to the side wall ventilation, which also is directed towards the lens 6, provides exceptionally free and normally more ventilation than has been usual in eye protectors or goggles of this character in the past, particularly chemical goggles, and definitely prevents fogging or steaming of the lenses or other discomforts due to heat and lack of ventilation, etc. during use.

To protect the eyes against chemical splash, light, dust, or other foreign matter during use, the slots 18 are angled relative to lines C radiating from the center 21 of the eyecup, see Fig. II. The angle of the slots 18 are such that, in the direction of the radial lines C, the inner end 30 of one of the side walls of each slot overlaps the outer end 31 of the other side wall of the slot and thereby prevents a liquid splash, light or other foreign means reaching the wearer's eyes. It is apparent that if a splash of liquid should enter the outer ends of the slots 18 it will strike the transversely angled side walls of the slots and be directed away from the eye of the wearer. To allow all the slots 18 to function properly during use the lens retaining ring 7 is shaped to form a circumferential air channel 32 which cooperatively associates all of the slots with the perforations 19 of the retaining ring. The side ventilation means is so constructed that if a splash of liquid should penetrate the perforations of the side shield 11 it will be deflected by the baffle plate 14 towards the lens 6 and in instances of this nature the slots 18 function as outlet means through which the liquid deflected by the baffle plate 14 may flow to the outside of the eye protector or goggle where it will not endanger the eyes of the wearer.

In Figure IV there is shown a slight modification wherein a baffle plate 22 similar to the baffle plate 14 is used but in this instance the front edge of the baffle plate is shaped to fit in close relation with the rear surface of the lens 6 and is provided adjacent said front edge with a plurality of vent apertures 29. These apertures provide means whereby the air entering the eyecups through the perforated plate 11 and slots 18 may enter the interior of said eyecups in the vicinity of the rear surface of the lens.

In each of the above described structures, as shown in Figures III and IV, the spaced side shield 11 and baffle plate 14 or 22, as the case may be, form a hollow air receiving chamber 23 at the side of the eyecup. The air from this chamber is adapted to pass through the restricted passageway 15 into another smaller chamber 24 formed between the front portion of the baffle plate and an outwardly deflected portion 25 of the side wall of the eyecup. This small chamber 24 also receives the flow of air entering the eyecup through the slots 18 and is adapted to direct the flow of air from both the large chamber 23 and slots 18 into the interior of the eyecup through the space 17 or perforations 23 as the case may be. This causes the flow of air from both sources to be directed across the rear surface of the lens 6. The slots 18 and perforations 19 on the nasal side of the eyecup, as shown in Fig. IV, provide air outlet openings by means of which a continuous circulation of air through the eye cup will be effected. It is apparent that the flow of air may pass through the eyecup from the temporal to the nasal side, or from the nasal side to the temporal side, depending upon the direction of the external flow of the air relative to the eye protector.

In some instances it may only be necessary, particularly in an eye protector or goggle designed for protection only against flying particles, dust, etc. to use only one or the other source of ventilation, that is, only the side shield or slot ventilation.

It is to be understood that the eyecups of the eye protectors or goggles must be in all instances properly fitted to the wearer as regards the distance between the eyecups during use in order to fit snugly and comfortable on the face.

This is accomplished through the provision of the adjustable bridge member **2** which, as shown in Fig. IV, comprises a ball chain tie member **26** or other suitable means having a flexible covering **27** thereon. The ends of the ball chain extend through openings in the nasal walls of the eyecups and are attached therein by removable anchor plates **28** internally of said eyecups. The distance between the eyecups may be varied to meet the requirements of the wearer by shortening or lengthening the chain. If properly adjusted the eye protector or goggle will fit snugly and comfortably on the face.

From the foregoing description it will be seen that I have provided simple, efficient and economical means of ventilating eye protectors of the above character wherein an abundant and free ventilation is provided with absolute protection against all eye hazards.

Having described my invention, I claim:

1. In a device of the character described, a goggle eyecup having an edge shaped to fit the face and an edge shaped to support a lens, said eyecup having a vent opening in the side wall thereof, a lens supported adjacent the lens supporting edge, means for securing the lens to the eyecup, a perforated screen secured outwardly of the eyecup with its edges overlapping the outer edges of the vent opening, a baffle plate secured internally of the eyecup with its edges overlapping the inner edges of the vent opening and forming an air chamber between it and the screen, the inner wall of said eyecup adjacent the front edge of the baffle plate being spaced from said baffle plate to form a relatively small chamber adjacent the rear surface of the lens and to form a restricted passageway leading from the first air chamber into the relatively small chamber, said small chamber having an air passageway extending into the interior of the eyecup adjacent the rear surface of the lens.

2. In a device of the character described, a goggle eyecup having means for engagement with the face and means for holding a lens in said eyecup, said eyecup having a relatively large vent chamber in a side wall thereof occupying the greater part of the area of said side wall and being closed to the interior of the eyecup on all sides except its side towards the lens and a relatively small vent chamber between said large chamber and rear surface of the lens, said large chamber having an air passageway leading into the small chamber and from said small chamber internally of the eyecup adjacent the rear surface of the lens.

3. In a device of the character described, a goggle eyecup having means for engagement with the face and means for holding a lens in position in said eyecup, said eyecup having a relatively large vent chamber in a side wall thereof closed to the interior of the eyecup along its peripheral edges on all sides except the side towards the lens and a relatively small vent chamber adjacent said large chamber and rear surface of the lens, said large chamber having an air passageway leading therefrom into the small chamber and from said small chamber into the eyecup adjacent the rear surface of the lens, said small chamber also having an air passageway leading therefrom outwardly of the eyecup.

4. In a device of the character described, a goggle eyecup having means for engagement with the face and means for supporting a lens in position in said eyecup, said eyecup having a vent chamber in a side wall thereof, the outer wall of said chamber having a plurality of openings therein and the inner wall of said chamber being relatively solid and closed on all sides except its side towards the lens to form a baffle plate internally of the eyecup, said relatively large vent chamber having an air passageway leading therefrom into the eyecup adjacent the rear surface of the lens.

5. In a device of the character described, a goggle eyecup having means for engagement with the face and means for supporting a lens in position on said eyecup, said eyecup having a vent opening in a side wall thereof, a lens supported by the lens supporting means, means for securing the lens to the eyecup, a perforated screen secured outwardly of the eyecup with its edges overlapping the outer edges of the vent opening and in intimate relation with said edges, a baffle plate secured internally of the eyecup with its edges overlapping the edges of the vent opening and forming an air chamber between it and the screen, said baffle plate being in substantially surface contact with the inner surface of the walls of the eyecup adjacent the vent opening on all sides including the side towards the means for engaging the face except the side towards the lens wherein it is spaced from the inner surface of the side wall and from the rear surface of the lens an amount sufficient to form a passageway leading from the air chamber to the rear surface of the lens.

NELSON M. BAKER.