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WELDER'S HELMET

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Fig. 1.

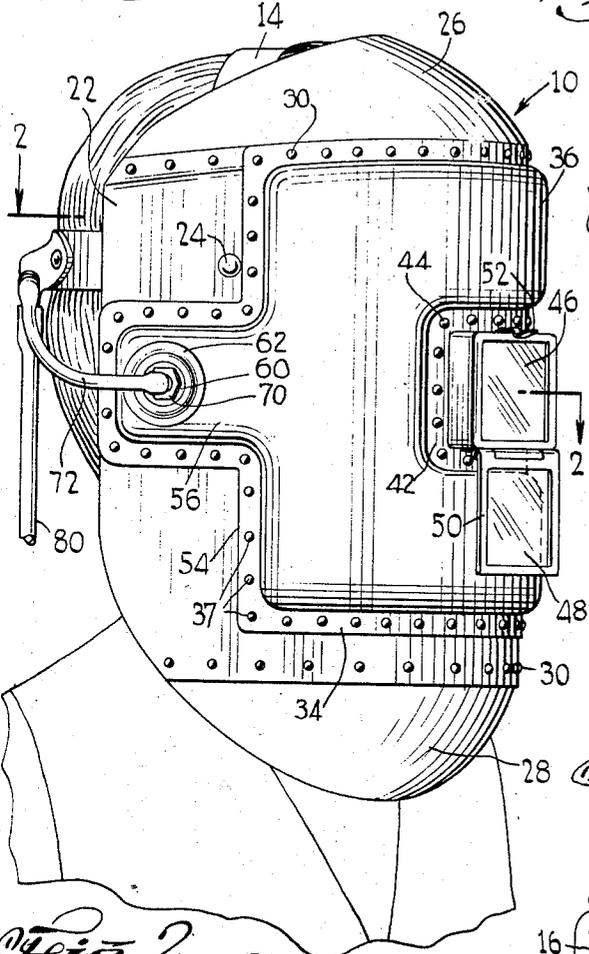


Fig. 3.

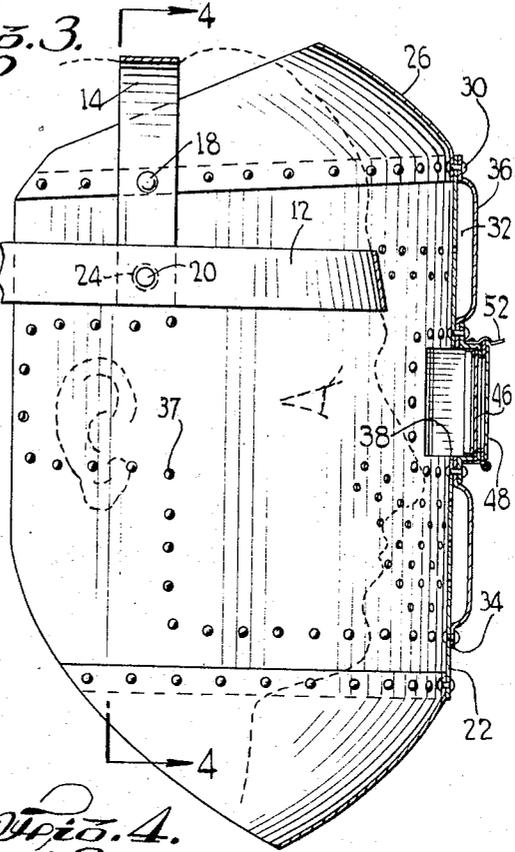


Fig. 4.

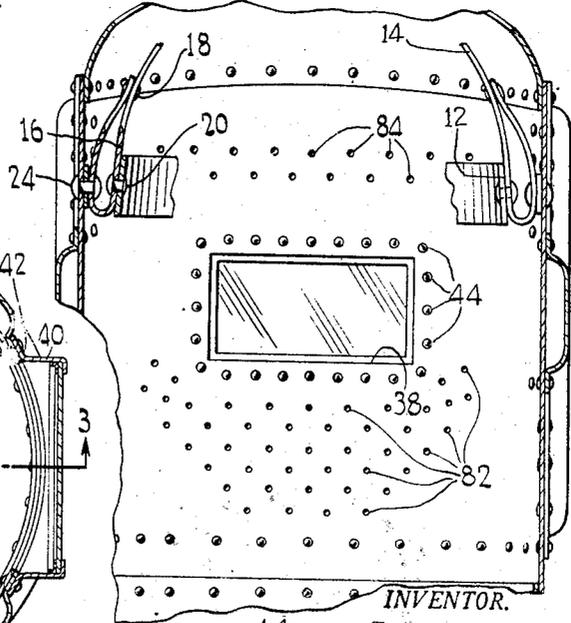
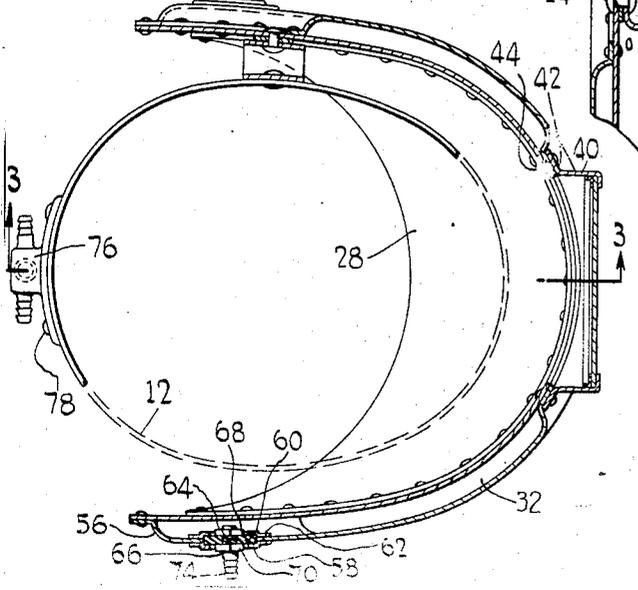


Fig. 2.



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WELDER'S HELMET

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3 Claims. (Cl. 128-143)

This invention relates to welders' helmets and the like.

The primary object of the invention is to provide an article of the character described having improved means for keeping noxious fumes and odors, and air-borne particles away from the respiratory orifices. In this connection a more specific object of my invention is to provide an article of the character described in which an ambient respirable medium is directed against the face in such manner as to form a gaseous curtain which segregates the nostrils and mouth from the atmosphere in which the wearer is working.

An ancillary object of my invention is to provide an article of the character described in which the said ambient medium is also employed to provide an auxiliary curtain which excludes contaminants and helps to cool the wearer.

Another object of my invention is to provide an article of the character described which comprises relatively few and simple parts, is rugged and durable in construction, comfortable to wear and highly efficient for the purposes set forth.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the claims.

In the accompanying drawing, in which is shown one of the various possible embodiments of this invention,

Fig. 1 is a perspective view of a welder's helmet embodying my invention;

Fig. 2 is a horizontal sectional view there-through taken substantially along the plane indicated by the line 2-2 in Fig. 1;

Fig. 3 is a central, vertical sectional view taken substantially along the plane indicated by the line 3-3 in Fig. 2; and

Fig. 4 is a sectional view taken substantially along the plane indicated by the line 4-4 in Fig. 3.

Referring now to the drawing, I have there shown a welder's helmet 10 constructed in accordance with my invention. The supporting and protective elements of said helmet may be of any standard form well known to the art.

In the embodiment herein disclosed, the supporting element comprises a head piece consisting of a thin oval band 12. The band 12, as well as the other sheet material used in the helmet and hereinafter described, preferably comprises a light, strong, semi-stiff and semi-resilient substance, such as a fibrous material impregnated with a synthetic resin and moulded or pressed to shape. A thin cross bow-strap 14 which connects the sides of the oval band 12 carries the weight of

the helmet. The ends of said bow-strap are turned up into loops 16 and held in this position by rivets 18. The inner sides of said loops are connected to the band 12 by rivets 20.

The protective element or face shield includes a main vertical arcuate wall 22 of sheet material pivotally connected adjacent the rear edge thereof by rivets 24 to the outer sides of the loops 16. To afford additional protection, rounded top and bottom pieces 26 and 28 of sheet material are attached to the upper and lower curved edges of the main sheet 22. The connections between the several sheets 22, 26 and 28 may be effected by plasticizing overlying portions of said sheets and allowing such plasticized portions to cohere or by adhering said portions with a plastic adhesive. To strengthen the joints between the sheets a plurality of small rivets 30 are employed.

In accordance with my invention, a plenum chamber 32 is incorporated in the face shield. Said chamber may be formed by attaching to the main curved sheet 22 the set-back peripheral edges 34 of an arcuate sheet 36 having a plan contour approximating that of said main sheet. The set-back edges 34 are joined and sealed to said main sheet 22 by plastic adhesives or plasticizers, and rivets. The upper edge of the front sheet 36 may be held to the plenum by the same rivets 30 that are employed to attach the rounded portion 26 to the main sheet 22. The remaining edges of the chamber front sheet are attached to the main sheet 22 by a plurality of rivets 37.

The central portion of the front sheet 36 is set back and apertured to coincide with an aperture 38 in the main sheet 22 so as to provide a viewing opening. A short rectangular tube 40 projects from this opening. Extending from the rear edges of said tube is an angular flange 42 which is of the same shape and size as the set-back edges surrounding the central aperture of the front sheet 36. Rivets 44 clamp said front sheet between the flange 42 and edges of the main sheet.

The forward end of the tube 40 is provided with two glass panes 46 and 48. The rear pane 46 is clear and stationarily mounted and the forward pane 48 is deeply tinted and carried in a frame 50 hinged to the tube 40. Said frame 50 may be detachably secured in its upper vertical position (shown in Fig. 3) by a spring catch 52.

It will be noted that the side edges 54 of the front sheet 36 do not extend as far back as the side edges of the main sheet 22, since, for a reason which will be shortly apparent, there is no need to provide a plenum chamber at this portion of the helmet 10. However, the front sheet does have a pair of narrow rearward extensions 56 which terminate at the side of the helmet, said extensions being employed to facilitate supply of an ambient respirable medium to the plenum chamber 32. In each of said extensions,

a large aperture 58 is provided which is closed off by a leather washer 60. Said washer is clamped in place between a pair of escutcheons 62 rigidly secured to opposite faces of the front sheet 36. The threaded shank 64 of a hose coupling 66 extends through an aperture in the leather washer, being held in this position by a nut 68 which compresses the washer between itself and a central flange 70 on said coupling. Short rubber tubes 72 connect the ridged end 74 of the hose coupling to a branch fitting 76 permanently and rigidly secured by rivets 78 to the rear of the band 12. A flexible impervious hose 80 supplies a respirable medium under pressure to the branch fitting 76 and through it to the two sides of the plenum chamber 32 through the short tubes 72.

It is desirable to offset the pivot rivet 24 from the plenum chamber in order to avoid packing this revolving joint. However, it will be appreciated that by virtue of the construction just described the face shield may be pivotally moved relative to the head band 12 without breaking the offset connection between the source of supply of the ambient medium and the plenum chamber, and that any angular strain placed upon the coupling 66 during rotary movement of the face shield is absorbed by flexing of the leather washer 60.

Further in accordance with my invention, the main sheet 22 is provided with a plurality of apertures which are laid out in accordance with a specific design in order to provide a blanket or protective curtain of a respirable medium surrounding the respiratory orifices. To this end, the orifices are located in and around the vicinity of the mouth and nostrils and are so disposed that the respiratory medium is directed substantially normal to the face. This will cause said medium to strike the face and mushroom out to regions of lower pressure away from the breathing passageways and carry with it all noxious odors and fumes and air-borne particles.

I have found that helmets of the type above described are superior to helmets wherein the ambient respirable medium is discharged at a point remote from the respiratory orifices or is supplied locally to the respiratory orifices but is not directed normally to the face.

My improved helmet, wherein an invisible curtain of air is generated, has also proved to be much more comfortable than respirators which rest against the face around the mouth and nostrils.

A pattern of apertures 82 is shown in Fig. 4 which will give highly satisfactory results. It will be understood, however, that any pattern which causes the breathing orifices to be blanketed and which is directed substantially normal to the wearer's face is within the scope of my invention.

A feature of my invention is the provision of a plurality of apertures 84 disposed in the vicinity of the wearer's brow. The ambient respirable medium forced out of the chamber in this region will noticeably cool the wearer and by mushrooming toward the low pressure area adjacent the top of the head will carry with it objectionable atmospheric elements thereby aiding the curtain created by the apertures 82 and keeping contaminants out of the eyes.

It will thus be seen that there is provided a device in which the several objects of this inven-

tion are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A device for excluding undesirable atmospheric elements from admission to the respiratory orifices, said device comprising a member which is adapted to be maintained in predetermined position in front of and spaced a short distance from the wearer's face, the space between said member and the wearer being open to the outside atmosphere, said member having a plenum chamber therein, apertures in the wall of said chamber immediately in front of the respiratory orifices, means to supply a respirable medium under pressure to said chamber, said apertures being so disposed that they will direct said medium toward and normal to the wearer's face around and close to the respiratory orifices whereby said medium will strike the face and flow toward the outside atmosphere thus preventing the outside atmosphere from reaching said respiratory orifices.

2. A device for excluding undesirable atmospheric elements from admission to the respiratory orifices, said device comprising a plate which is adapted to be maintained in predetermined position in front of and spaced a short distance from the wearer's face, the space between said plate and the wearer being open to the outside atmosphere, a second plate whose edges are attached and sealed to said first plate, the remainder of said second plate being spaced from said first plate whereby to provide a plenum chamber, means to admit a respirable medium under pressure to said chamber, said first plate having a plurality of apertures therein immediately in front of the respiratory orifices so as to direct said medium toward and normal to the wearer's face around and close to the respiratory orifices thereof whereby said medium after striking the wearer's face will flow outwards toward the atmosphere.

3. A device for excluding undesirable atmospheric elements from admission to the respiratory orifices, said device comprising a plate which is adapted to be maintained in predetermined position in front of and spaced a short distance from the wearer's face, the space between said plate and the wearer being open to the outside atmosphere, means to support said plate for pivotal movement relative to the wearer, a second plate whose edges are attached and sealed to said first plate, the remainder of said second plate being spaced from said first plate whereby to provide a plenum chamber, flexible means in said second plate to admit a respirable medium under pressure to said chamber, said first plate having a plurality of apertures therein immediately in front of the respiratory orifices so as to direct said medium toward and normal to the wearer's face around and close to the respiratory orifices thereof whereby said medium after striking the wearer's face will flow outwards toward the atmosphere.

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