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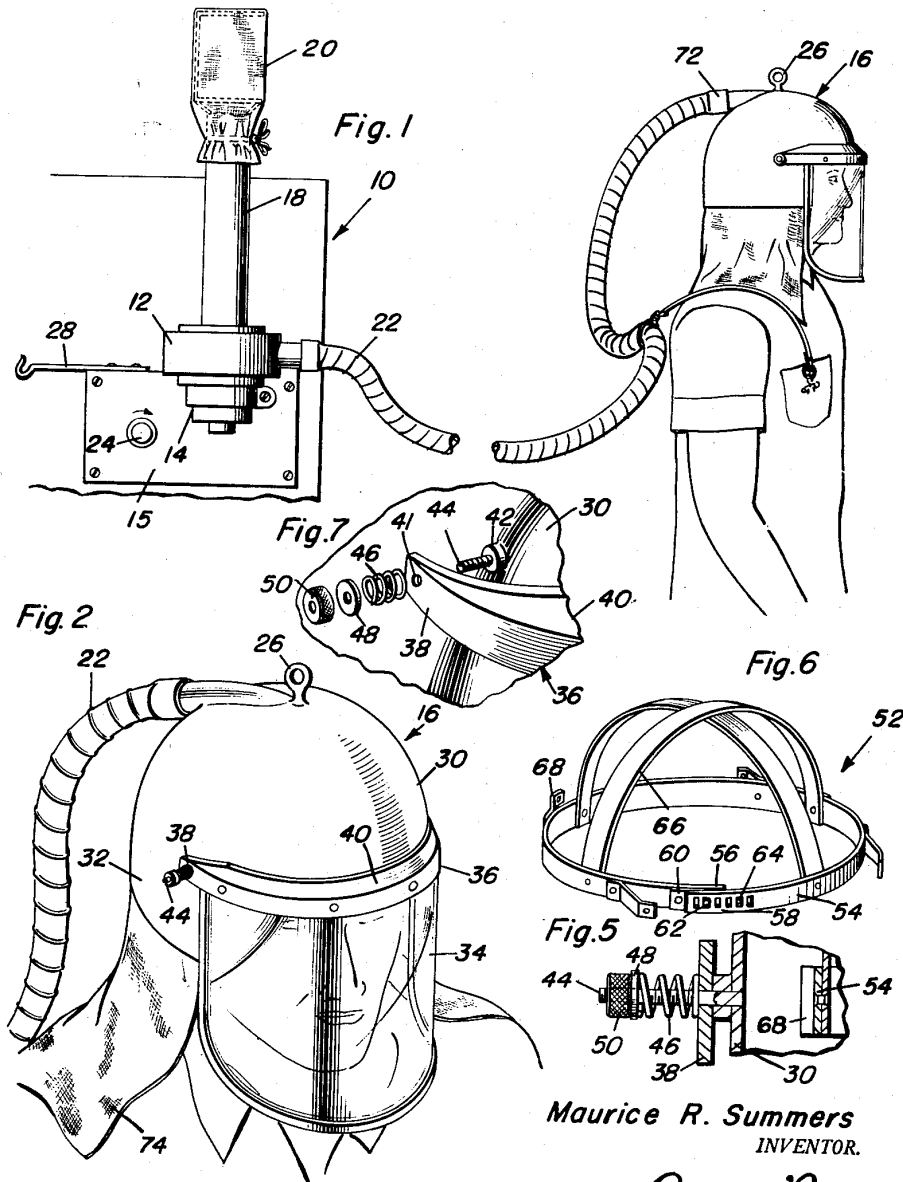
M. R. SUMMERS

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APPARATUS FOR PROTECTING WORKMEN FROM DUST

Filed April 28, 1953

2 Sheets-Sheet 1



Maurice R. Summers  
INVENTOR.

BY *Almon C. O'Brien*  
and *Harvey B. Jacobson*  
Attorneys



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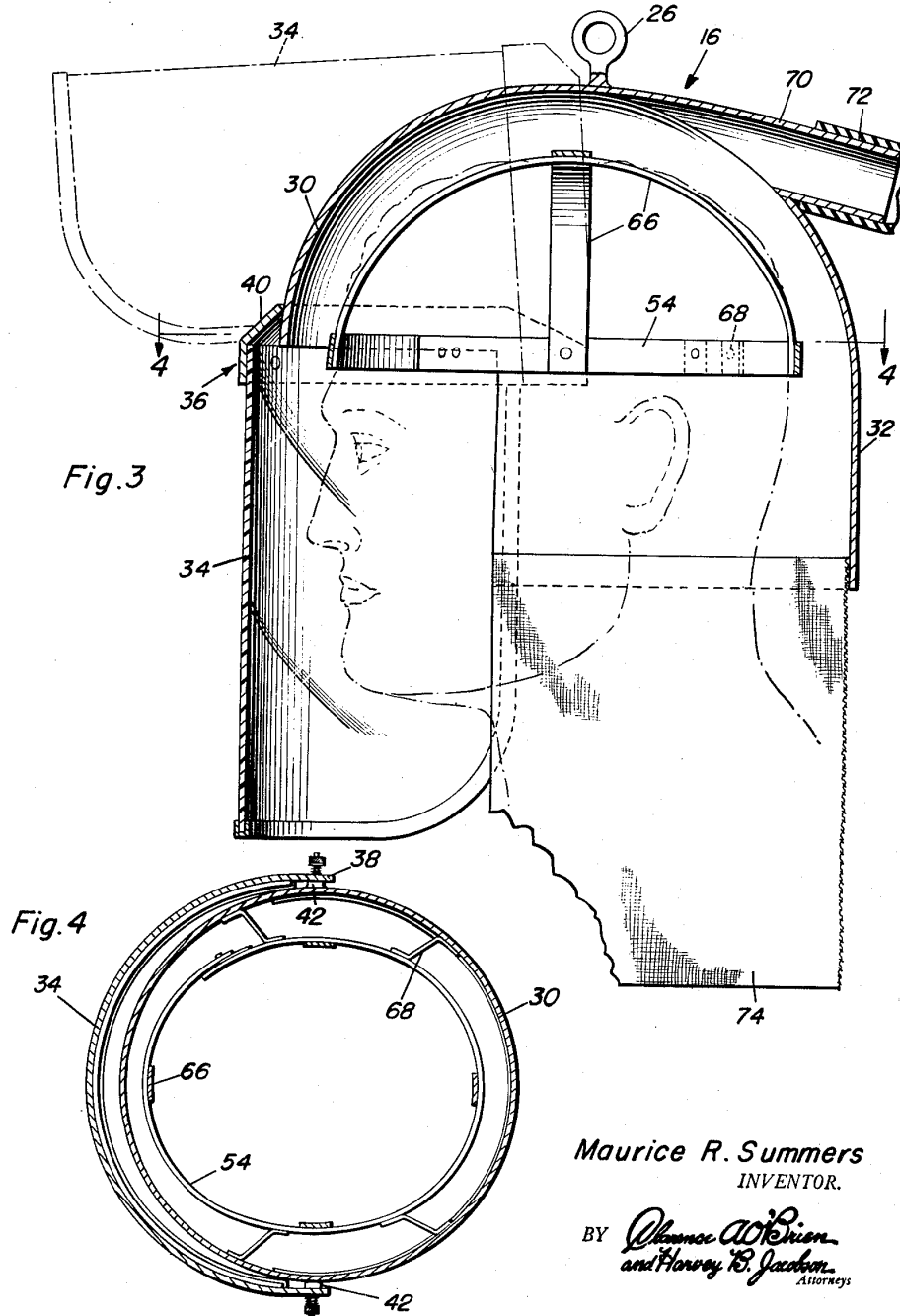
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2 Sheets-Sheet 2



Maurice R. Summers  
INVENTOR.

BY *Oliver A. Olson*  
and *Harvey B. Jackson*  
Attorneys



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## UNITED STATES PATENT OFFICE

2,688,962

### APPARATUS FOR PROTECTING WORKMEN FROM DUST

Maurice R. Summers, Monrovia, Ind., assignor of  
one-half to Charles H. Foley, Martinsville, Ind.

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7 Claims. (Cl. 128—142)

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The present invention relates to a portable apparatus for protecting workmen from dust and is a continuation-in-part of my co-pending application Serial No. 142,229 filed on February 3, 1950 now abandoned.

The principal object of the present invention is to safeguard indoor and outdoor workmen against breathing dust laden air, or air borne particles or other foreign matter and is primarily concerned with the protection of farm workmen while working around farm machinery such as hay balers, combines and the like about which a great deal of dust and other particles are stirred up preventing them from breathing fresh air.

Another object of the invention, ancillary to the preceding object, is the provision of an apparatus for generating a current of air continually past the workman's face which will dispel chaff and dust from the immediate vicinity of the workman's face, which current of air is substantially free of dust or other foreign particles stirred up during the operations of the workmen.

Apparatus for protecting workmen from dust have been made, but, insofar as this applicant is aware, they were designed for factory compartment use and are not adapted for use with farm machinery and related equipment, where mobility, ease of installation and removal of the apparatus in order to change from one machine to another and the necessity for a light weight apparatus which would impair neither the sight nor the hearing of the wearer must be considered.

The aforementioned difficulties are substantially overcome by the present invention and particularly by the provision of a novel helmet which is adapted to be worn on a workman's head, together with means for delivering a supply of fresh air into the helmet so as to afford the workman proper breathing.

A most important feature of the invention resides in the particular construction of the helmet itself which is constructed in such a manner that neither the sight or hearing of a wearer is impaired and which permits free and easy movement of the head and neck of the wearer while continually directing a current of fresh air downwardly over the face of the wearer.

Still another feature of the invention resides in the provision of a helmet having a transparent face plate that may be readily raised and lowered by the wearer.

Another feature of the helmet resides in the

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provision of a headband by means of which the helmet can be adapted to a wide range of head sizes.

These, together with other ancillary objects and features which will become apparent as the following description proceeds are attained by the present invention, a preferred embodiment of which is shown by way of example only in the accompanying drawings, wherein:

Figure 1 is a perspective view of the complete apparatus constituting the present invention mounted in operating position;

Figure 2 is an enlarged perspective view of the helmet per se;

Figure 3 is a side elevational view in cross-section of the helmet;

Figure 4 is a sectional view of the helmet taken substantially along section line 4—4 of Figure 3;

Figure 5 is a detail view, in section, of the pivotal connection of the face plate to the helmet;

Figure 6 is a perspective view of the headband utilized with the helmet; and

Figure 7 is an enlarged detail view of the pivotal connection of the face plate to the helmet.

Referring now to the accompanying drawings in detail, attention is first directed to Figure 1 wherein the portable apparatus constituting the present invention is designated in its entirety by the numeral 10.

As shown in this figure, the apparatus 10 comprises generally a blower 12 operated by a suitable electric motor 14, both of which are mounted on a supporting bracket 15. A vertical stack or conduit communicates with the inlet side of the blower 12 and is designated by the numeral 18. Upon the upper end of the stack 18 is secured in any suitable manner a cloth like filter 20.

A flexible hose 22 extends from the outlet side of the blower 12 to a helmet 16, the interior of which is in communication with the free end of the flexible conduit 22 whereby air forced through the blower 12 will pass through the helmet 16.

As can be seen from a comparison of the helmet with the bracket, blower and motor therefor, the entire apparatus is quite small and may be easily transported from place to place and set up as desired.

The bracket 15 may be conveniently attached to the frame of a tractor or other piece of farm machinery as desired. Also carried by this bracket, but not shown, is a rheostat connected in any known manner with the energizing circuit of the motor 14. Dial 24 on the bracket 15 provides a means for varying the resistance of the



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rheostat to vary the current entering the motor 14 and thus control the speed of the motor and consequently of the blower 12, which in turn controls the rate of flow of air through the flexible conduit 22.

The apex of the crown of the helmet is provided with an eyepiece 26 which is adapted to engage a hook 28 on the bracket 15 to support the helmet when the same is not in use.

The helmet 16, which constitutes a very important part of the invention, will now be described in detail with reference to Figures 2-7 of the drawings.

The helmet 16 comprises generally a dome-shaped crown 30 having a depending apron integrally extending from the edge of the crown and extending partially therearound. The apron is designated by the numeral 32 and is shown as having its opposing edges being spaced from one another and providing an opening in the front of the helmet. A transparent face plate 34 closes the opening in the front of the helmet.

As will be noted from the drawings, the face plate conforms substantially to the curvature of the crown and is spaced radially outwardly therefrom. A strip 36 is secured to the upper portion of the face plate on the outer surface thereof and lies parallel to the upper edge of the face plate throughout the length of this upper edge. The end portions 38 of the strip 36 extend rearwardly beyond the side edges of the face plate and are pivoted to the crown 30 of the helmet 16 in a manner to be hereinafter described.

The strip 36 includes a flange portion 40 projecting above the upper edge of the face plate 34 and bridging the space between the upper edge of the face plate and the crown 30. When the helmet is in its face covering position, wherein it lies parallel to the apron 32, the flange 40 frictionally engages the crown 30 and prevents further downward movement of the face plate.

To fasten the end portions 38 of the strip 36 to the helmet 16, the crown 30 is provided on its outer surface at approximately diametrically opposite points with a pair of bosses 42 from which threaded pins or rods 44 extend.

The end portions 38 of the strip 36 are provided with apertures 41 through which the threaded pins 44 pass. A coil spring 46 fits over the free end portion of each pin 44. Washer 48 is slid over the free end of each pin 44 and then nut 50 is threaded onto the pin to apply the required amount of friction to each end portion 38 between the spring and the boss 42. Obviously, by loosening the nut 50, the friction will be lessened and more freedom of the pivoting action will result. It is desirable that the nut 50 be set in such a manner that the friction is such on the pivoting action of the strip 36 and consequently the plate 34 whereby as the face plate 34 is lifted, it will remain in any desired position. As will be noted in Figure 3, at its upper limit, when it is completely raised, the face plate 34 is disposed in a position substantially perpendicular to the apron 32. In this connection, it is to be noted that the face plate is pivoted about a different axis from the radius of curvature of the crown 30. This permits a decrease of the friction between the flange portion 40 of the strip 36 and the outer surface of the crown 30 as the face plate 34 is raised above the face of the wearer of the helmet.

A headband 52 is provided within the crown 30 of the helmet to adjustably support the helmet on the head of a wearer. The headband 52 comprises a flexible, adjustable strap 54 having over-

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lapping ends 56 and 58. The end 56 is provided with a bracket 60 having a projecting pin 62 thereon while the end 58 is provided with a longitudinally spaced row of apertures 64. By selectively projecting the pin 62 through a selected aperture 64, the effective diameter of the strap 54 may be varied. Bracing bands or loops 66 are secured at spaced points to the inner surface of the strap 54 to engage the head of a wearer of the helmet.

Longitudinally spaced on the outer surface of the strap 54 are a plurality of clamps 68 which spacedly secure the strap 54 to the inner surface of the helmet. Thus, when the helmet is placed upon the head of a wearer, a space is provided between the crown and the head of the wearer.

Extending tangentially from the apex or central portion of the crown 30 and opening into the interior of the crown is a tubular extension 70 constituting an air nozzle for supplying air to the interior of the helmet. The tubular extension 70 extends rearwardly from the crown and a nipple 72 received over the outer end of this tubular extension secures the flexible hose thereto.

With this particular tangential extension of the air nozzle 70, the air being forced through the flexible hose 22 after entering the interior of the helmet 16 follows the curvature of the crown to direct a current of air downwardly past the face of the wearer between the face plate and the face of the wearer. This current of air is then dissipated out the lower end of the face plate and effectively prevents chaff, dust and other foreign matter from coming in contact with the face of the wearer. Thus, a simple and highly effective means of providing clear, fresh air to the workman is provided.

As an additional protection against the incidence of chaff and dust, a flexible skirt depends from the peripheral edge of the apron 32 to surround the back and sides of the neck and shoulders of the wearer. This skirt is designated by the numeral 74.

From the foregoing description, it will be readily understood that the present invention provides a simple and effective means for inducing an air current through a helmet to be worn by a workman, which helmet allows room for continuous movement of air from the crown of the helmet down over the face of the wearer and exhausting at the lower extremities of the face piece. However, since numerous modifications and changes will readily occur to those skilled in the art after a perusal of the foregoing description taken in conjunction with the accompanying drawings, it is not desired to limit the invention to the exact construction shown and described. But, all suitable modifications may be resorted to which fall within the scope of the appended claims.

What is claimed as new is as follows:

1. In a portable apparatus for protecting workmen against dust, a helmet comprising a dome-shaped crown, a depending apron secured to said crown and extending partially therearound, a transparent face plate closing the space between the opposing edges of said apron, means pivotally securing said face plate to said crown for raising and lowering said face plate relative to said crown, an air inlet nozzle opening into said crown for directing a current of air downwardly past said face plate.

2. In a portable apparatus for protecting workmen against dust, a helmet comprising a dome-





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shaped crown, a depending apron secured to said crown and extending partially therearound, a transparent face plate closing the space between the opposing edges of said apron, means pivotally securing said face plate to said crown for raising and lowering said face plate relative to said crown, an air inlet nozzle opening into said crown for directing a current of air downwardly past said face plate, said face plate substantially conforming to the curvature of said crown and being spaced outwardly therefrom.

3. In a portable apparatus for protecting workmen against dust, a helmet comprising a dome-shaped crown, a depending apron secured to said crown and extending partially therearound, a transparent face plate closing the space between the opposing edges of said apron, means pivotally securing said face plate to said crown for raising and lowering said face plate relative to said crown, an air inlet nozzle opening into said crown for directing a current of air downwardly past said face plate, said face plate substantially conforming to the curvature of said crown and being spaced outwardly therefrom, a rigid strip secured to the upper portion of said face plate and extending parallel to the upper edge of said face plate, said strip including a flange portion extending substantially throughout its length overlying the upper edge of the face plate and frictionally engaging said crown when the face plate is in covering position to prevent further downward movement of the plate.

4. In a portable apparatus for protecting workmen against dust, a helmet comprising a dome-shaped crown, a depending apron secured to said crown and extending partially therearound, a transparent face plate closing the space between the opposing edges of said apron, means pivotally securing said face plate to said crown for raising and lowering said face plate relative to said crown, an air inlet nozzle opening into said crown for directing a current of air downwardly past said face plate, said air inlet nozzle comprising a tubular extension projecting tangentially from the central portion of the crown rearwardly of the crown.

5. In a portable apparatus for protecting workmen against dust, a helmet comprising a dome-

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shaped crown, an apron integrally depending from said crown and extending partially therearound and providing an opening between the spaces opposing edges of the apron, a transparent face plate closing said opening, said face plate substantially conforming to the curvature of the crown and being spaced radially outwardly therefrom when in its closed position, a strip secured to the upper portion of the face plate and lying parallel to the upper edge of the face plate throughout the length of said edge, the ends of said strip projecting beyond the side edges of said face plate, means pivotally securing the ends of said strip to said crown whereby the face plate may be raised and lowered with respect to the crown, an air inlet nozzle opening into said crown for directing a current of air past said face plate.

6. The combination of claim 5 wherein said strip includes a flanged portion bridging the space between said plate and said crown frictionally engaging said crown to prevent further downward movement of the face plate with respect to the crown when in closed position.

7. In a portable apparatus for protecting workmen against dust, a helmet comprising a dome-shaped crown, a depending apron secured to said crown and extending partially therearound, a transparent face plate closing the space between the opposing edges of said apron, means pivotally securing said face plate to said crown for raising and lowering said face plate relative to said crown, an air inlet nozzle opening into said crown for directing a current of air downwardly past said face plate, and a liner mounted within the crown for securing the helmet on the head of a wearer.

## References Cited in the file of this patent

### UNITED STATES PATENTS

Number	Name	Date
680,419	Schaeffer	Aug. 13, 1901
2,436,508	Fairbanks	Feb. 24, 1948
2,579,942	MacLean	Dec. 25, 1951

### FOREIGN PATENTS

Number	Country	Date
484,638	Great Britain	May 9, 1938