

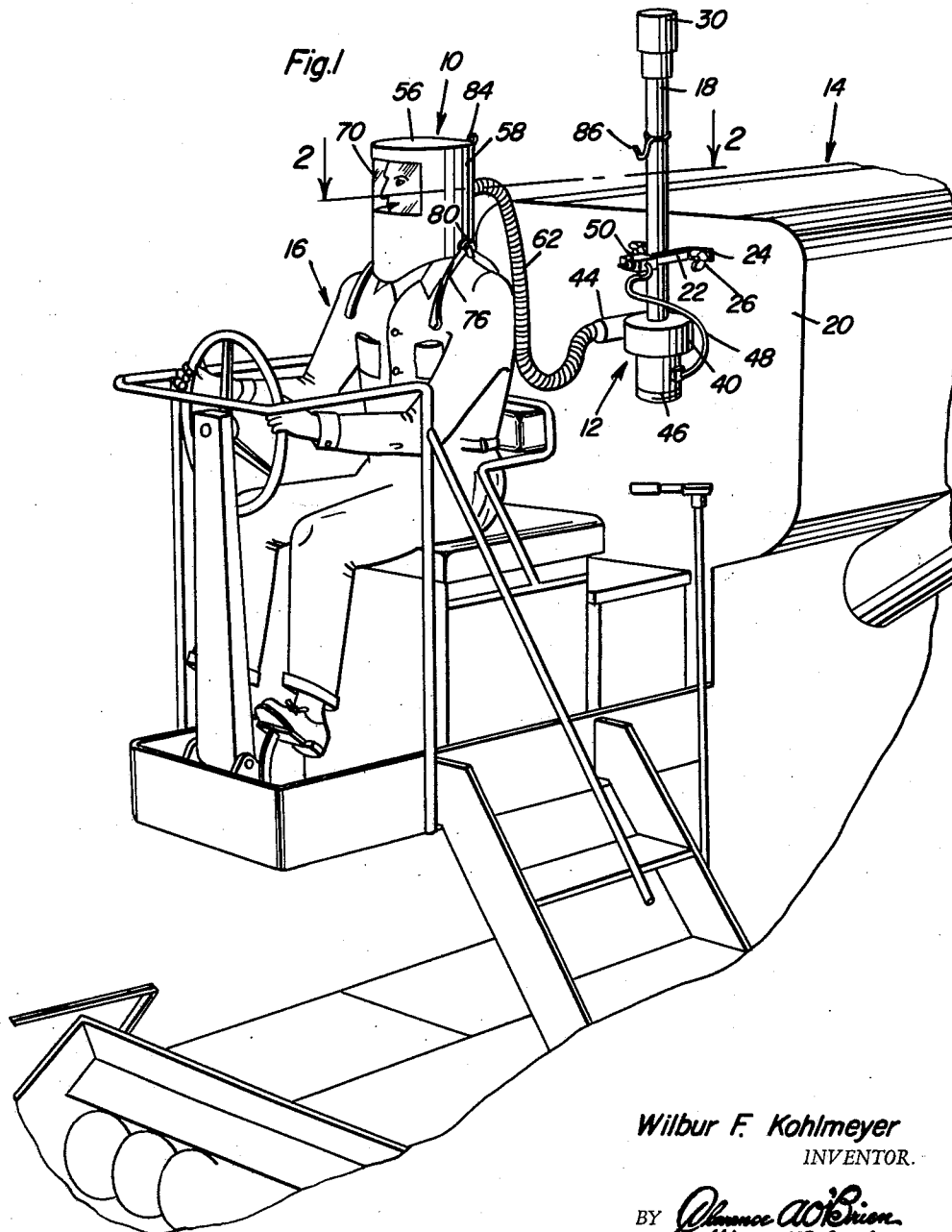
Feb. 26, 1963

W. F. KOHLMAYER
PORTABLE DUST ELIMINATOR

3,078,845

Filed March 24, 1961

2 Sheets-Sheet 1



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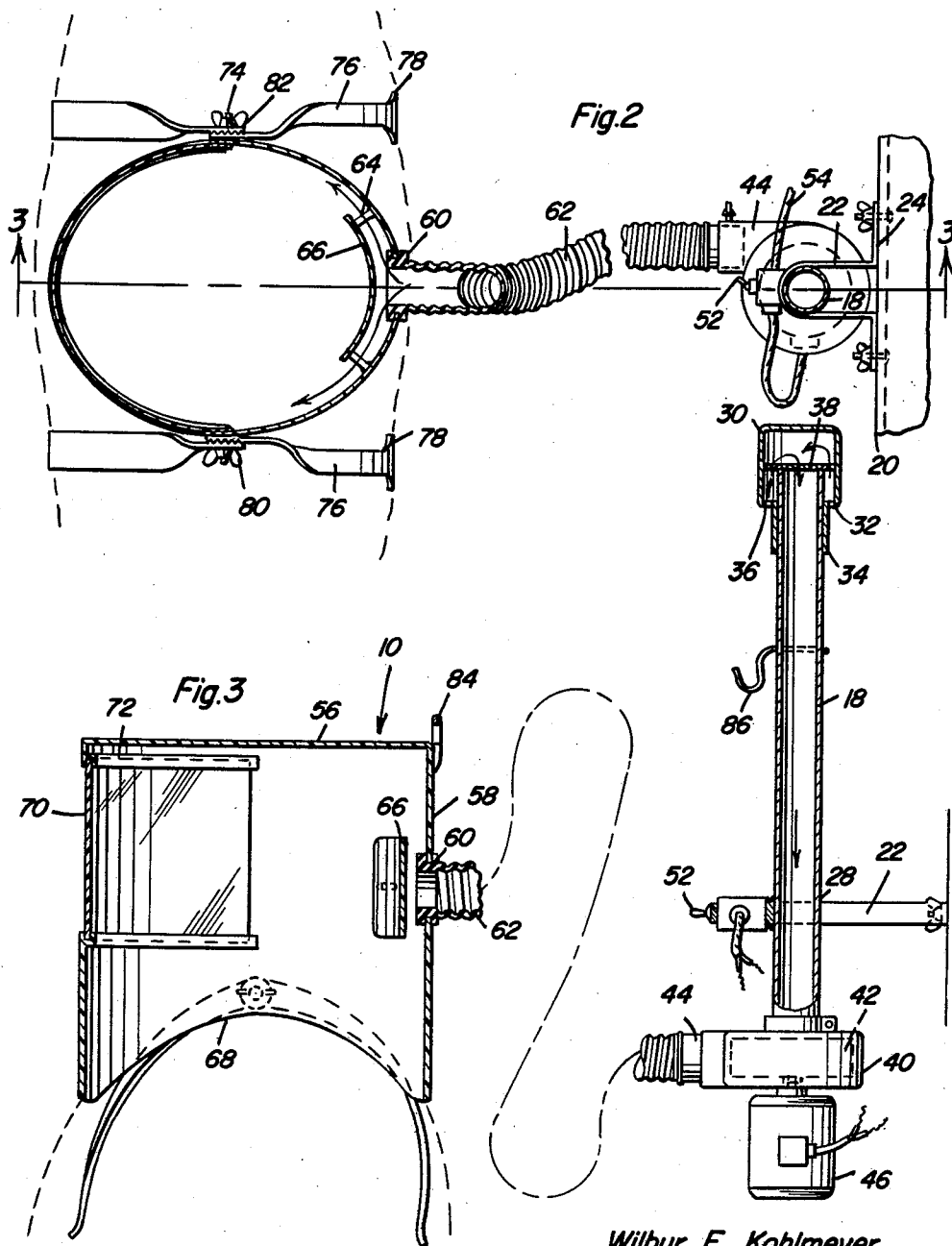
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3,078,845

PORTABLE DUST ELIMINATOR

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Filed Mar. 24, 1961, Ser. No. 98,197
3 Claims. (Cl. 128—141)

The present invention generally relates to a device for supplying filtered air to an operator of machinery normally encountering dusty or similar conditions whereby the dust or other impurities will not be breathed since any contaminated air will be replaced by forcing filtered air into a headpiece which encloses the head and rests directly on the shoulders.

A problem existent in various occupations is one in which the operators of machinery are subjected to dusty conditions during normal operations. One example of this is in the combining of sorghum crops or the like and also in various farm operations such as plowing, cultivating, harvesting and the like. Therefore, it is the primary object of the present invention to provide a head enclosure which is portable in nature and which rests on the shoulders of the person and completely encloses the head together with a forced filtered air supply mechanism for drawing in a supply of fresh air, filtering it and discharging it into the interior of the head enclosure thus preventing any possible entrance of dust or other impurities into the head enclosure thereby enabling the operator to more efficiently perform his duties with less fatigue thus reducing injuries sometimes caused by carelessness induced by fatigue and further enables an operator to work longer between rest periods and generally be in a more comfortable condition while working.

Another object of the present invention is to provide a portable dust eliminator in which the forced air is supplied by a motor powered fan driven from a suitable source of electrical energy such as a tractor battery or the battery found on self-propelled harvesters, combines and the like.

Still another feature of the present invention is to provide a dust eliminator in accordance with the preceding objects in which a novel bracket structure is provided for mounting the fan and intake filter on a machine together with a novel adjustment arrangement for supporting the head enclosure from the shoulders of the person using the device.

Another important feature of the present invention is to provide a dust eliminator in which the head enclosure is provided with an arcuate baffle disposed in the path of movement of the air as it is discharged into the head enclosure so that the air will not directly impinge upon the head but will be deflected peripherally of the head enclosure.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the dust eliminator of the present invention illustrating the manner of use thereof and the orientation in relation to a harvesting or combining machine;

FIGURE 2 is a detailed sectional view taken substantially upon section line 2—2 of FIGURE 1 illustrating further structural details of the invention; and

FIGURE 3 is a vertical, sectional view taken substantially upon a plane passing along section line 3—3 of FIGURE 2 illustrating further structural details of the invention.

The dust eliminator of the present invention includes a head enclosure generally designated by the numeral 10 and an air filtering and blowing assembly generally des-

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ignated by the numeral 12. For purposes of illustration, the present invention is being disclosed with the air filtering and blowing assembly being mounted on a farm machine such as a combine generally designated by the numeral 14 in which the operator generally designated by the numeral 16 is subjected to dusty conditions. The combine may be the type employed when combining sorghum or other farm crops and it is pointed out that the invention may be incorporated with other types of machinery and especially farm machinery having a power source such as a six or twelve volt battery thereon.

The air filtering and blowing assembly includes an elongated vertically disposed rigid intake pipe 18 attached to a vertical wall 20 of the combine 14 by virtue of a generally U-shaped bracket 22 having outwardly extending ears or feet 24 lying against and secured to the wall 20 by suitable fasteners 26. The apex of the U-shaped bracket 22 is rigidly attached to the intake pipe 18 as by welding 28 or the like. The upper end of the intake pipe 18 extends above the machine to a position that normally is relatively clean and free of dust or other impurities. The intake pipe 18 has a cylindrical cap 30 on the upper end thereof which cap is cylindrical and larger than the pipe 18. The top of the cap is closed and spaced above the top end of the pipe 18 and the lower end of the cap 30 is provided with an inwardly extending flange 32 terminating in a cylindrical portion 34 rigidly affixed to the pipe 18 by any suitable means such as welding, screw threading or the like. The flange 32 is provided with a plurality of openings 36 therein for permitting inlet of air into the area defined between the upper end of the pipe 18 and the cylindrical cap 30. Extending transversely of the cylindrical cap 30 and disposed against the upper end of the pipe 18 is a filtering screen 38 or the like for filtering dust and other impurities from the air. The filtering screen 38 may be of any suitable construction and may be in the form of a wire mesh screen, a plastic screen or any other suitable type of air filter capable of removing dust and other particles and impurities from the air. Preferably, the cap is removable in order to clean or replace the filter 38.

The bottom end of the intake pipe 18 is attached to the generally cylindrical blower housing 40 having an impeller 42 rotatably disposed therein and having a tangential outlet 44 connected thereto. The blower may be in the form of a squirrel-cage type of fan or any suitable centrifugal type blower having an inlet at the center and an outlet tangentially at the outer edge. The opposite side or bottom of the housing 40 is connected with a suitable electric motor 46 for operating the blower by rotating the impeller 42. The motor 46 may be of any suitable capacity and an electrical conductor 48 is connected to motor 46 and extends upwardly to one side of a switch 50 mounted on the apex of the bracket 22. The switch 50 is provided with an operating lever 52 facing forwardly so that the operator 16 may easily operate the switch lever 52 by merely turning partially around and grasping the lever 52 in an obvious manner. The switch 50 is also provided with an electrical conductor extending to the source of electrical energy such as a six or twelve volt battery and, of course, the motor 46 would operate on this source of electrical energy. The supply electrical conductor is designated by numeral 54 and the details of the switch may vary in that any type of suitable commercially available switch mechanism may be employed.

Referring now specifically to FIGURES 2 and 3, the head enclosure designated generally by the reference numeral 10 includes a generally oval-shaped top 56 and a depending peripheral wall 58. The portion of the wall 58 disposed at the rear of the head of the operator 16 is provided with a grommet 60 receiving one end of an elongated flexible hose 62 which has the other end thereof

secured to the tangential outlet 44 for the fan housing 40. As illustrated in FIGURE 2, the wall 53 is provided with a pair of bracket members 64 supporting an arcuate baffle 66. The arcuate baffle 66 is spaced from the discharge end of the hose 62 so that incoming air will be deflected peripherally of the internal surface of the wall 53 generally as illustrated in FIGURE 2 by the directional arrows illustrating the flow of air. This prevents direct discharge of the air onto the head of the person using the device.

The lower edge of the peripheral wall 53 is provided with opposite arcuate recesses 63 which conform to the shoulders of the operator 16. The front portion of the wall 58 is provided with a transparent insert 70 which enables the operator to easily observe the field or other area so that his duties may be properly conducted. The transparent insert may be received in a channel shaped framing groove 72 formed in the peripheral wall 58. Also, the entire wall 58 may be transparent if desired or a portion thereof may be opaque or translucent with the remainder being transparent. In conditions where bright sunshine is encountered, it sometimes is desirable to have the top and rear portion of the head enclosure of opaque material with only the front portion thereof being transparent or with only the insert 70 being transparent.

Attached to opposite side portions of the peripheral wall 58 is a pair of mounting pivot bolts 74 disposed adjacent the arcuate notch 68. Each of the bolts 74 receives an arcuate shoulder engaging strap 76 having outwardly flared and enlarged terminal end portions 78 for engagement with the surfaces of the front and rear portion of the shoulders of the operator thus positioning and supporting the head enclosure 10 as well as a portion of the hose 62. Each bolt 74 is provided with a wing nut 80 thereon for securing the straps 76 in place and each of the straps 76 is provided with radial serrations 82 on the facing surfaces thereof underlying the wing nuts 80 for locking the straps 76 in angularly adjusted position in relation to each other whereby the straps 76 may be adjusted for different sized shoulders for the expeditious supporting engagement with the shoulders.

With the head enclosure supported from the shoulders, there is no weight whatsoever exerted on the head of the operator and the lower edge of the wall 58 generally conforms to the shape and configuration of the portion of the body adjacent the neck whereby normal movement of the head may be permitted without any interference from the head enclosure 10.

For supporting the head enclosure 10, there is provided an upstanding loop or eye member 84 at the rear upper edge of the head enclosure 10 and the eye member 84 is adapted to engage over a hook 86 rigidly attached to the intake pipe 18 at a suitable elevational position thereby enabling the head enclosure to be supported conveniently when not in use.

As the air is pulled in through the cap 30, it is filtered by the screen or filter 38 and then moves downwardly through the intake pipe 18 into the blower which discharges the clean filtered air through the flexible hose 62 into the head enclosure and against the external surface of the baffle 66. The air then encircles the head so that it may be readily available for breathing purposes and a certain amount of the air will be continuously discharged downwardly through the bottom end of the enclosure which is somewhat spaced from the shoulder and adjacent area of the body but which generally conforms thereto. This will provide the operator with a constant supply of fresh filtered air thus eliminating the aggravating conditions caused by dust and other impurities in the air. While the head enclosure is disposed in enclosing relation to the head, the shoulder straps provide support therefor from the shoulders thus eliminating any weight being supported by the head which would be quite tiring to the operator. The transparent insert or the completely

transparent wall whichever is used will not interfere with the normal peripheral vision of the operator and the operator can twist his head within the interior of the enclosure a certain amount and, of course, may twist his body in the usual manner for observing the operation of the harvester or combine or for observing whatever operation desired.

While a pair of shoulder engaging straps 76 have been illustrated, it is also contemplated to use a single inverted U-shaped member engaging over each shoulder and connected to the head enclosure in the same manner as illustrated. This type of construction is contemplated if heavy wire is employed rather than strap material.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a portable apparatus for the protection against dust a head enclosure comprising a flat top wall, a perpendicularly depending peripheral wall connected to the top wall, a transparent area included in said peripheral wall for enabling a wearer to observe the operation of a machine or the like wearing the head enclosure, the bottom edge of the peripheral wall having arcuate notches therein generally conforming to the shoulders whereby the head enclosure forms a hood for the entire head and neck, and means for supporting the head enclosure from the shoulders of the wearer, said last named means including a pair of arcuate straps for engaging each shoulder, a pivot bolt means connecting the straps to each other and mounting the straps at the point of connection thereof to the head enclosure for adjustment of the straps in relation to each other and in relation to the head enclosure for supporting the head enclosure in the desired position from the shoulders.

2. The structure of claim 1 wherein each strap is provided with radial serrations at the point of connection of the straps to each other for locking the straps in angularly adjusted position to each other and in relation to the head enclosure.

3. The structure as defined in claim 1 wherein said head enclosure is provided with a hole in the rear and top of said depending peripheral wall for the forced entrance of conditioned air and an arcuate baffle disposed interiorly of said head enclosure and spaced from the peripheral wall in overlying relation to the air entrance hole whereby air forced into the head enclosure will be deflected peripherally of the head enclosure by the baffle and associated depending wall.

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