Jan. 1, 1957 J. POLLI ET AL 2,775,968

MASK-TYPE RESPIRATOR

Filed Feb. 8, 1954

Fig. 1

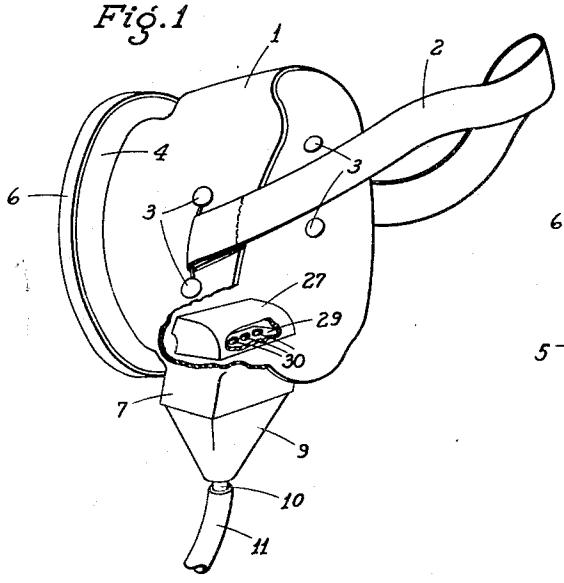


Fig. 2

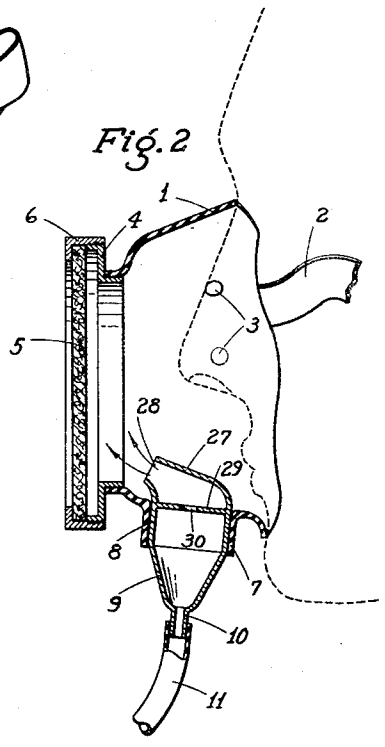


Fig. 3

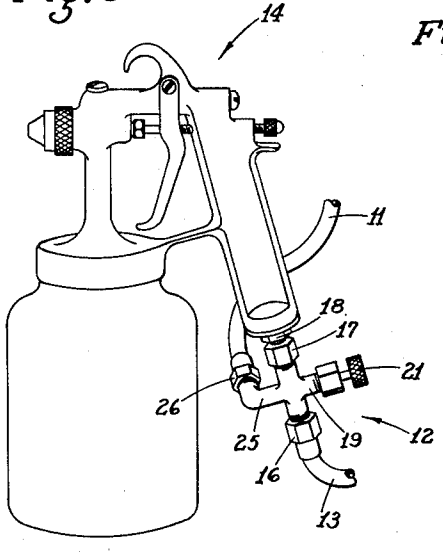
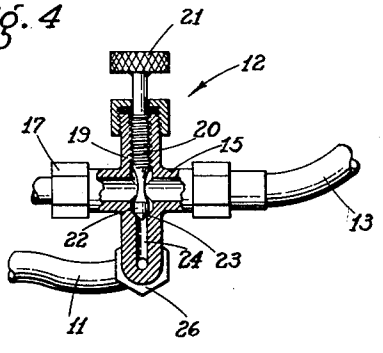


Fig. 4



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MASK-TYPE RESPIRATOR

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3 Claims. (Cl. 128—145)

The present invention is directed to, and it is a major object to provide, improvements in a mask-type respirator such as is used by industrial and commercial workers to prevent the inhalation of noxious material; the respirator being especially designed—but not limited—for use by an operator of paint spraying equipment.

Another object of the invention is to provide a mask-type respirator which is arranged in novel manner for the feeding of fresh clean air into the mask during the period of its use, yet without the entering air causing any annoyance or discomfort to the wearer.

An additional object of the invention is to provide a mask-type respirator, as in the preceding paragraph, which is adapted for use in combination with an adjustable bypass valve arranged in connection with the air pressure supply hose leading to the pneumatically actuated equipment being used by the operator; the air as so bypassed being conducted by a separate hose into said respirator.

A further object of the instant invention is to provide a mask-type respirator which includes a filter disc mounted on the mask and open to atmosphere on the outer side and facing into the mask on the inner side; such filter disc preventing access to foreign substances into the mask while it is in use, while at the same time permitting the air to escape from within the mask and without any undesirable air pressure build-up therein.

It is also an object of the invention to provide a mask-type respirator which is designed for ease and economy of manufacture, and convenience of use.

Still another object of the invention is to provide a practical and reliable mask-type respirator, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a perspective view of the mask-type respirator; the view being taken generally from one side and to the rear, and being partially broken away.

Fig. 2 is a sectional elevation of the mask-type respirator as in use.

Fig. 3 is a side elevation showing the adjustable bypass valve as arranged in connection with the air pressure supply hose leading to a pneumatically actuated piece of equipment; such equipment here being shown as a paint spray gun.

Fig. 4 is an enlarged fragmentary elevation, mainly in section, showing the structure of the adjustable bypass valve.

Referring now more particularly to the drawings and to the characters of reference marked thereon, the improved mask-type respirator comprises a cup-type mask body 1 of relatively stiff but flexible rubber; such mask body being open at the rear and shaped to engage the face of an operator in surrounding relation to the nose and mouth. See Fig. 2.

The mask is held in place on the operator's face by a flexible head strap 2 connected to opposite sides of the mask body, as at 3.

At the front the mask body 1 is formed with a relatively large-diameter opening into which is fitted a mounting ring 4, and a replaceable filter disc 5 of suitable air pervious material is removably secured, in full covering relation, to the mounting ring 4, by means of a retention collar 6 threaded onto said ring 4, as shown.

At the bottom thereof the mask body 1 is formed with an integral depending neck 7, and an air intake member in the form of a hollow coupling 8 matchingly and frictionally engages in said neck 7.

The hollow coupling 8, which is generally rectangular in plan in the central portion thereof, tapers downwardly in the lower portion, as at 9, terminating at the lower end in a nipple 10.

The nipple 10 is connected to one end of a flexible hose 11; such hose being of substantial length, and terminating at the end opposite the nipple 10 adjacent an adjustable bypass valve, indicated at 12. This bypass valve 12, which is hereinafter described in greater detail, is connected between the air pressure supply hose 13 and a pneumatically actuated piece of equipment, here shown as a paint spray gun, indicated generally at 14.

The adjustable bypass valve 12 includes a main tubular body 15 connected at one end by a coupling 16 to the air pressure supply hose 13, and connected at the other end by a coupling 17 to the air intake fitting 18 of the paint spray gun 14. With this arrangement the major portion of the air pressure supply delivers from the hose 13 to the paint spray gun 14 to pneumatically actuate the latter.

The tubular valve body 15 is formed, on one side, with a laterally projecting boss 19 into which is threaded a metering screw 20 having a knurled head 21 on its outer end. The metering screw 20 intersects the bore of the tubular valve body 15, and said screw is reduced in diameter at such point in order to assure free flow of the air pressure supply through the tubular valve body 15.

At its inner end the metering screw 20 is formed with a taper valve 22, which cooperates with a matching valve seat 23 in the bore 24 of a laterally extending bypass leg 25 formed on the tubular valve body 15 opposite the boss 19. At its outer end the leg 25 is connected by a coupling 26 to the adjacent end of the hose 11.

With the above described adjustable bypass valve 12 a controlled quantity of air from within said valve can, by the simple expedient of adjusting the valve 22 by the head 21, be bypassed from within the tubular valve body 15 into the hose 11, which bypassed air thence flows into the mask body 1 through the coupling 8, providing a constant supply of fresh clean air to the operator wearing the respirator.

In order to prevent the air stream which enters the respirator from directly striking the nose or mouth of the operator, and which would be annoying—if not dangerous—the following arrangement is provided:

At its inner end the hollow coupling 8 is formed with an integral nozzle 27 which has a discharge mouth 28 which opens forwardly and upwardly; i. e., in the direction of the filter disc 5, and as shown by the arrows in Fig. 2. Thus, as the air stream enters the mask body 1 of the respirator, such stream is first directed toward and impinges against the inner face of the filter disc 5, which effectively reduces the velocity, so that the air thence flows easily in the respirator about the nose and mouth of the operator without annoyance to him.

To further assure of proper distribution of the air stream as it emits from the nozzle 27, the hollow coupling 8 is formed, at the base of said nozzle, with an

integral baffle plate **29** having a plurality of ports **30** in spaced relation therein.

The nozzle includes an upper forwardly and upwardly sloping wall, as clearly shown in Fig. 2, and the baffle **29** and holes or ports **30** therein are disposed so that the air passing through such holes will be thrown against said nozzle wall before leaving the mouth **28** of the nozzle.

The filter disc **5** serves a dual purpose in that it not only permits of the escape of the constantly flowing air from within the mask body **1** to atmosphere, carrying off the impurities of breathing, but additionally prevents the access into the mask body **1** from exteriorly of said disc of foreign substances. Further, the filter disc **5** is sufficiently porous that the constantly flowing air passes relatively freely through such disc, to the end that there is no built-up or undesirable back-pressure within the confines of the mask body **1**.

With the described mask-type respirator fresh clean air is constantly supplied in the zone of the nose and mouth of the operator of the pneumatically actuated equipment, such as the paint spray gun **14**, and as long as it is in operation the respirator prevents the access of noxious materials into such zone. By reason of the concept of using a bypassed quantity of the air pressure supply which feeds to the pneumatically actuated equipment, the operator is assured of a proper air supply in the respirator at all times; this being a great advantage, as well as a safety feature.

From the foregoing description it will be readily seen that there has been produced such a device as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations therefrom may be resorted to as do not

form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful and upon which Letters Patent are desired:

1. A mask-type respirator comprising a head-supported, cup-like mask open at the rear and adapted to engage the face and enclose the nose and mouth of a wearer, said mask having a front opening, an air-pervious filter disc secured on the mask in covering relation to said front opening, an air intake member projecting into the mask at the bottom thereof and depending therefrom for connection at its lower end to a source of air under pressure, and a nozzle on the upper end of said member facing forwardly to discharge air against the filter disc.

2. A respirator as in claim 1, in which the nozzle includes a mouth of rectangular and relatively wide form transversely of the respirator.

3. A respirator as in claim 2, with a transverse baffle in the intake member below the nozzle; the baffle having a plurality of holes therethrough; and said baffle and the holes being arranged so that air entering the member will be distributed and deflected against the top wall of the nozzle before such air leaves the nozzle.

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