

[54] **IMPROVED SPRAY MASK**

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[22] Filed: May 13, 1971

[21] Appl. No.: 143,154

Related U.S. Application Data

[52] U.S. Cl.: 128/142.7, 2/8, 2/14B
 [51] Int. Cl.: A62b 18/04
 [58] Field of Search: 128/141, 142, 142.5, 142.7; 2/8, 9, 14R, 14B, 14C, 14K, 14N, 5

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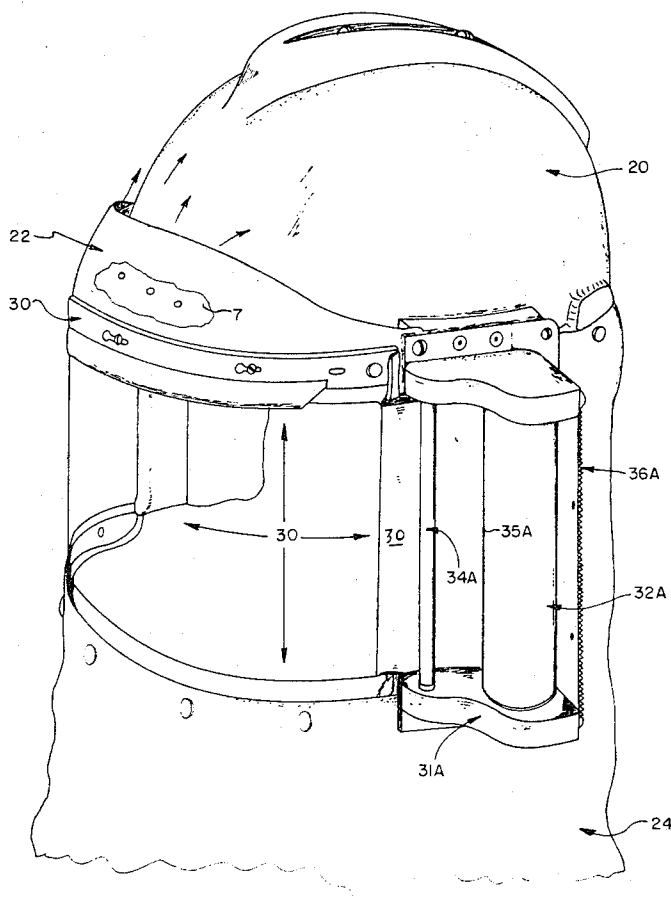
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[57]

ABSTRACT

A spray mask comprising a safety hat to which is coupled a clear plastic face shield and a cloth shroud cover from the brim thereof to the user's shoulder. Clear acetate film is so arranged in canisters coupled to the mask as to facilitate the film being quickly and efficiently caused to move across the face shield, thereby ensuring that the user's vision is continuously maintained despite overspray conditions. The mask also comprises a ventilation system.



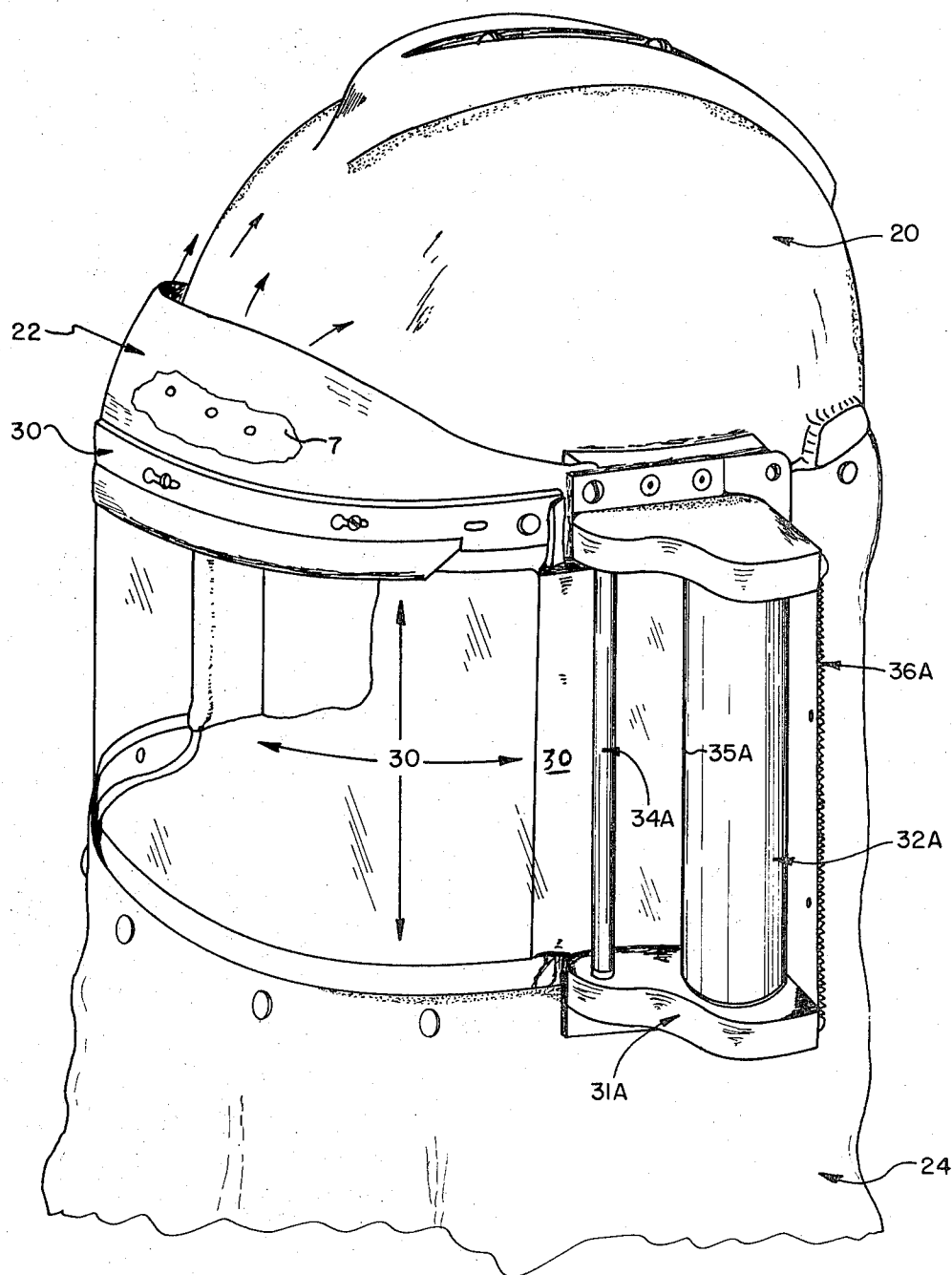


FIG. 1

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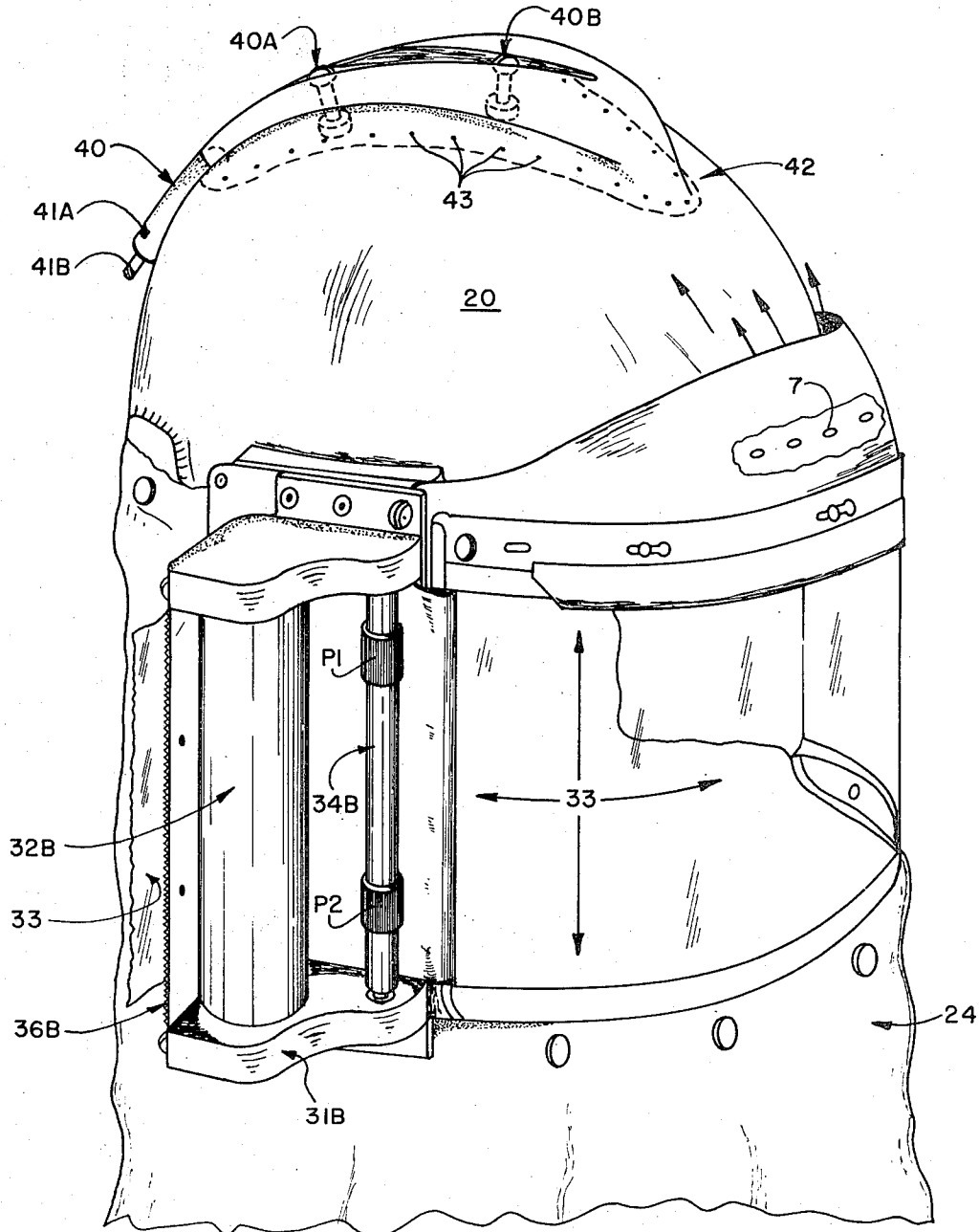
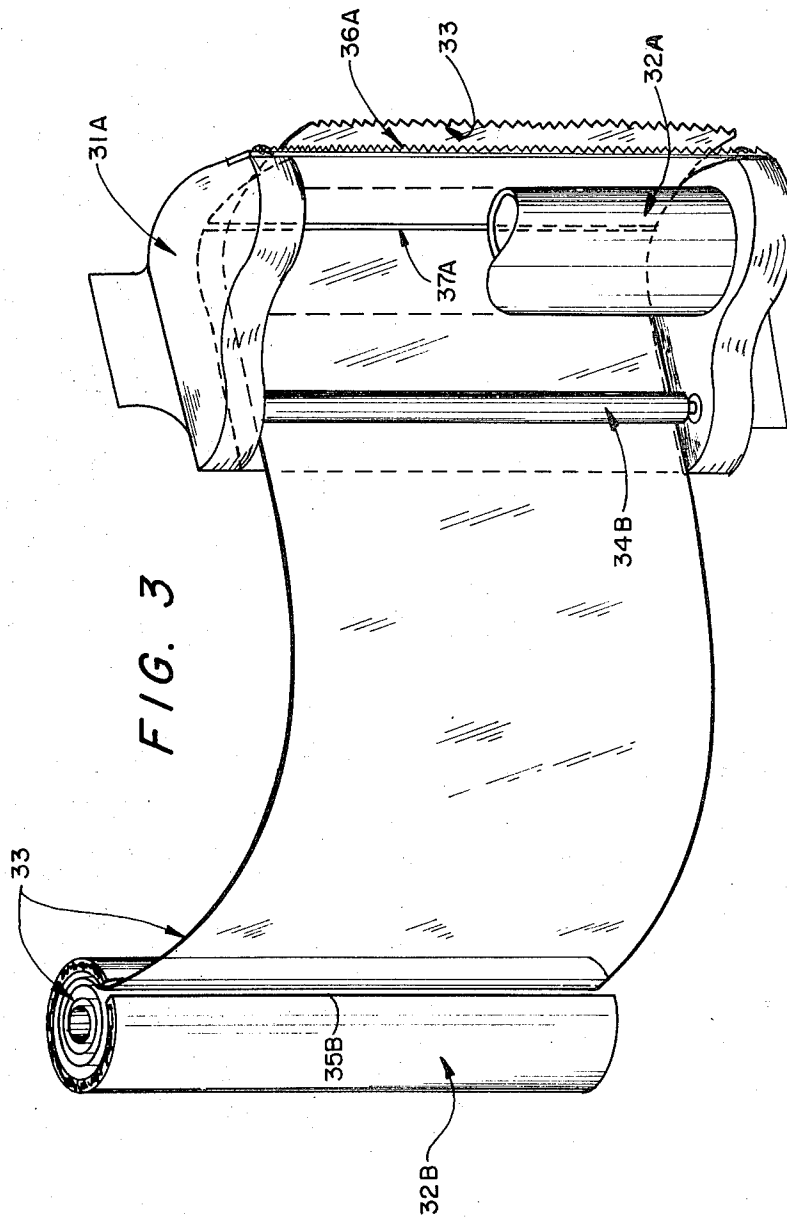


FIG. 2

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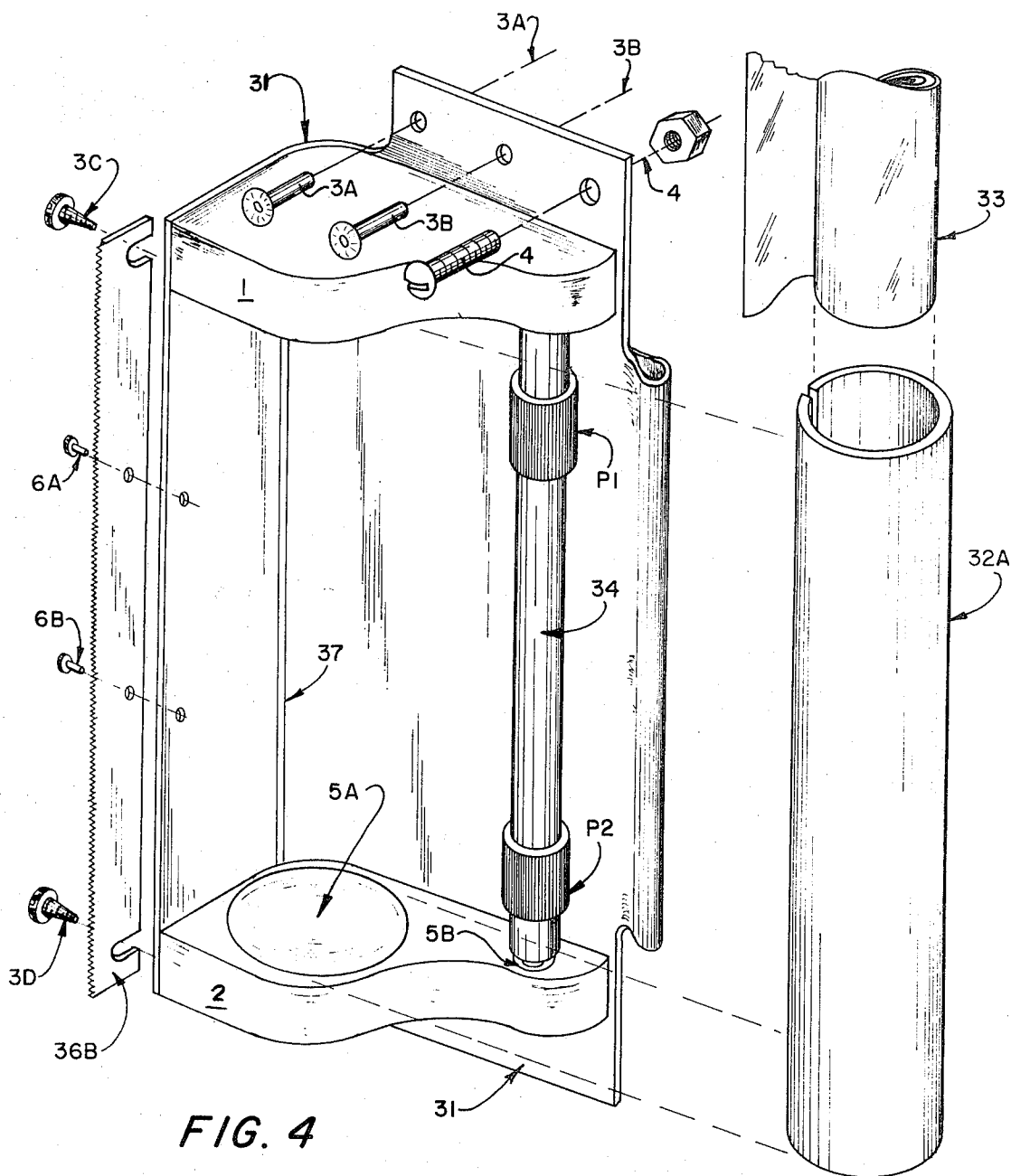
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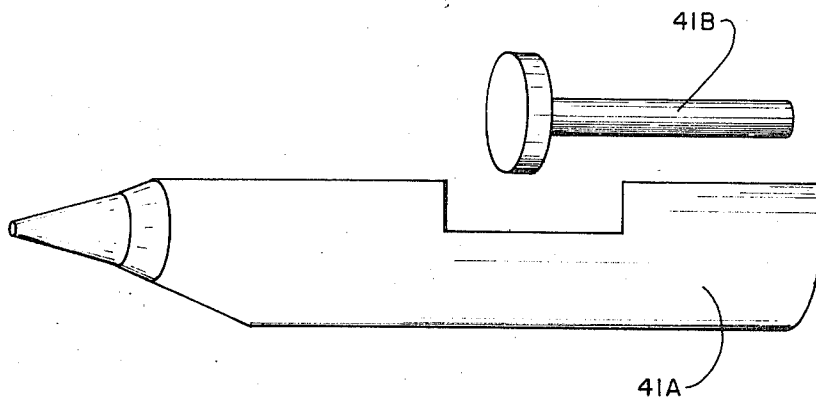


FIG. 5

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IMPROVED SPRAY MASK

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to improvements in face masks and/or particularly to an improved face mask to be used in connection with painting, spraying, dusting, grinding and the like.

2. Description of the Prior Art

In many industrial applications, painting and other types of spraying is often required to take place in confined areas. Under such conditions, some sort of covering is usually required to protect the eyes from the paint or other material being sprayed, and to enable continued vision. Another significant problem is the toxicity of most of the paints and other materials being used for industrial applications. Such paints pose severe hazards to the painter in terms of physical contact with the head, eyes and face, and emissions of toxic gases in the air, especially, as is the usual case, when the painting or other operation is performed in a confined area and when overspray conditions are frequent.

A number of protective steps are presently employed. One approach, of course, would be to wear goggles so as to enable continued vision and to provide some protection to the eyes. Unfortunately, however, the ordinary goggle is usually covered over quite rapidly with the paint or other sprayed materials due to so-called over-spray or back-scattering of the material in the confined area. When this occurs, the painter or other personnel must stop his work long enough to clean off the goggles or replace them with a new pair. In fact, it is usually necessary to halt all work in the area until such times as the overspray condition has subsided. The resulting loss in work time and efficiency is a significant problem. Further, the goggles give no protection in terms of the painter's head or facial skin, nor do they affect in any way the toxic air being breathed by the painter.

A number of steps have been employed by industry in attempting to overcome these problems. For example, to avoid body contact the painter covers most of his head with a cloth hood and applies petroleum jelly to exposed facial areas. He wears a paint respirator over his nose and mouth for breathing clean air during the operation. However, covering and taping of a cloth hood on the head to seal from paint overspray takes considerable time from the work day and is uncomfortable and cumbersome. The application of jelly to open facial areas does not stop toxic coatings from penetrating the skin and eyes. This has even caused temporary blindness in some cases. Further, wash and clean-up time is needed at a day's end for the painters. In addition, periodic blood tests are required for painters to assure no overdoses of toxic properties in the blood stream, and painters must be alternated to reduce this condition. Obviously, loss of work, time and pay runs high for personnel using these methods. Painters wearing respirators in direct contact with overspray areas have to change filters and mask often due to paint build-up on the respirator and filter pads. Here again, exiting from work areas to allow overspray to subside reduces the work day production

by 50 percent. Longer periods of time working in these types of areas ensure a greater work loss due to the toxic conditions of the painters themselves.

One attempt to overcome the vision problem is the use of goggles employing moveable lenses as described in Patent No. 2,886,819 by Joseph H. Uphoff. Such goggles have generally proven unsatisfactory for a number of reasons. The winding mechanism for the lenses are prone to sticking with increased application of paint, and the mechanism is quite cumbersome to operate especially in a confined area where the operator is usually holding the spray hose or other implement in one hand. Further, replacement of a film roll requires exiting from the painting area, contributing to the loss of time and efficiency. The goggles also limit vision, tend to fog up, are hot and uncomfortable to wear. Also, the grooves along which the lenses are moved are prone to fill rather rapidly with paint and hence are "cemented" in place within a short period of time.

SUMMARY

In view of the foregoing limitations in available facial equipment for painters and others exposed to overspray of paint or other materials or gases, it is a general object of the invention to provide an improved face mask which allows continuous vision by the painter or other user by completely protecting the head, face and eyes from the toxic effects of paint or other materials.

It is another object of the invention to provide an improved face mask which continuously filters the air and provides fresh clean air to the painter or other user at all times.

It is yet another object of the invention to provide an improved face mask which allows painters or other users to function more efficiently and for longer periods of time in confined areas while subjected to overspray and toxic materials.

It is yet another object of the invention to provide an improved face mask which protects the painter or other user completely from facial contact with the noxious material, which allows continuous breathing of fresh air even in confined areas, and which enables full vision at all times, and yet is easy and fast to put on and to remove, more efficient, and cheaper to implement than presently available methods.

The invention consists of a close-fitted hard hat to which a clear plastic face shield has been attached and covers the painter's face for protection but gives him vision. The outer half of the hat from the brim to the shoulders is covered by a cloth shroud. Attached to the face shield are a pair of holder assemblies, each containing a canister having a roll of clear acetate film, a roller, and a cutter bar. The film is used to cover the face shield. When the film is coated with overspray, the painter pulls the film such that it advances so all the area on the face shield is replaced with clean film, thus maintaining the painter's vision. The used film is torn off on the cutter bar and discarded. The hat also incorporates an air filter system for clean air and is designed to connect directly to the spray gun fresh air supply.

Further objects, features and advantages of the

present invention and a better understanding thereof will become apparent with the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a left side view of the improved spray mask showing one of the canisters and cutter bars;

FIG. 2 is a right side view of the improved spray mask showing the other canister and cutter bar;

FIG. 3 is a front elevation of the transparent film shown in conjunction with its canister and cutter bar;

FIG. 4 is an exploded view of a film canister, its holder assembly, and cutter bar detailing the interrelation thereof;

FIG. 5 is an enlarged view of the male/female insert for the quick disconnect tube used with the invention's ventilation system.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of subject invention is shown in FIGS. 1 and 2. As noted therein, the invention comprises hard hat 20 to which is attached brow guard 22 and face shield 30 of clear plastic, providing the painter's face protection and clear vision. The outer half of hat 20 from the brim to the shoulders and from the bottom of the face shield to the chest is covered by cloth shroud 24. Attached to each side of face shield 30 is holder assembly 31 containing a plastic canister 32 with a roller 34 to the front of it and a serrated cutter bar 36 behind it. In the preferred embodiment, each canister is loaded with a roll of 0.005 clear acetate film 33, which is eight feet long. Referring first to FIG. 1, to load acetate film 33 for operation, the end is pulled through, say the slot 35A in canister 32A, slid under roller 34A, acting as a guide roller, and then across face shield 30; referring now to FIG. 2, film 33 is then pulled under roller 34B, a pressure roller, and thence under canister 32B and pushed through slot 37B (shown in FIG. 4) in holder assembly 31B that aligns it to cutter bar 36B.

In the example given, the film being used was that loaded in the canister on the user's left. This would naturally be the case where the user's right hand is being used to pull the film from left to right. In such a case, roller 34A acts as a guide, while roller 34B, fitted with rubber pads P1 and P2, acts as a pressure roller.

The device can be operated just as easily from right to left, as, say, when the user's left hand is employed to pull the film. In this case, rollers 34A and 34B are interchanged so that the pressure roller is located in proximity to that side of the helmet where the film is cut. Here, film 33 would be pulled from canister 32B, under guide roller 34A, across face shield 30, under pressure roller 34B, through slot 37A so as to be aligned with cutter bar 36A. A front elevation of the transparent film in conjunction with its canister and cutter bar is shown in FIG. 3.

When the film is coated with overspray, the painter

pulls the projecting film until the film advances so all the area on the face shield is renewed with clean film, thus maintaining the painter's vision. The used portion is then torn off on the cutter bar by pulling it forward and down with one motion.

Proper tension is maintained on the film by the natural action of the rolled film within the canister, which unwinds itself by centrifugal force. No winding mechanism or springs are needed. Sliding the film under the guide roller not only effectuates smooth movement but prevents any seepage or paint behind the film and onto the face shield. As aforementioned the pressure roller is identical to the guide roller except for the addition of two rubber pads. It is employed to prevent backlash of the film and, secondarily, to aid in guiding it along. (As noted, two canisters and two rolls of film are available, allowing right or left handed operation easily and providing a backup or spare.)

Referring now to Fig. 4, holder assembly 31 is a partially enclosed unit having a top 1 and bottom 3 and, in the preferred embodiment, coupled to the face shield via rivets 3A and 3B and nut and bolt piece 4. Along the vertical length of the assembly from top piece 1 to bottom piece 2, in the rear corner, is slot 37. Located on bottom piece 2 is a tension button 5A which can be depressed. The tension button is of rubber or other suitably flexible material. Serrated cutter bar 36 is shown attached to holder assembly 31 via rivets 3C and 3D and sheet metal screws 6A and 6B. Roller 34 is shown set in place between top piece 1 and bottom piece 2 on tension button 5B. (Although here the roller is a pressure type, it could also be a guide roller as previously noted.) A roll of film 33 is dropped into canister 32A and the canister, in turn, is set on tension button 5A and simply snapped into place between top piece 1 and bottom piece 2. As can be seen, the film is completely enclosed and protected from paint overspray.

Returning to FIG. 2, the back crown of hat 20 is equipped with a special plastic quick-disconnect inlet tube 40 which exits into a perforated plenum chamber 42 inside the crown of the hat. (Tube 40 is held in place by nylon bolts 40A and 40B.) Plenum chamber 42 then disperses the incoming air for ventilation via spaced apertures 43. As shown in FIG. 2, and with more specificity in FIG. 5, quick disconnect tube 40 comprises a machined (notched) female repository 41A on the helmet and a male insert 41B on the end of the tube to enable the tube to be easily snapped into place and removed. The plenum chambers allow for even dispersal of air over the head of the wearer rather than concentrating all of the incoming air onto one point. From plastic disconnect 40 runs a light weight flexible tube that, in the preferred embodiment, is attached to a charcoal belt filter equipped with an air flow regulator (not shown). In the preferred embodiment, the filter is a standard mine safety appliance type. From the outer side of the flow valve that is on the air flow system is a standard disconnect with a line going to a tee fitting in the spray gun air line. Air can now pass from the spray gun air line to the hip filter, be regulated for comfort by the painter and enter the top of the hard hat bringing clean air inside the mask. (If desired, the painter may also wear a twin char-

coal respirator under the mask for additional fume protection.) This design allows the spray gun air line to be used also for ventilation air within the helmet; it eliminates the requirement for a separate air hose— which, in confined areas especially, is quite cumbersome. 5

The helmet is deliberately not sealed airtight but it is enclosed, for safety. Consequently, whether a respirator is worn or not, the film would tend to naturally fog up since the air cannot escape quickly enough through the natural openings or through the pores in the shroud. To obviate this problem, the venting system is specially designed such that, as shown in FIGS. 1 and 2, ventilation apertures are provided in the visor of the helmet in close proximity to the film mask. The moisture and warm air are thus drawn out via the quickest and nearest route. The visor, helmet, and brow guard are designed relative to each other, using known principles, such that as this air exits through the apertures, a vacuum is created on the top of the hat. The vacuum, in turn, draws away a significant percentage of overspray which, in turn, reduces the amount of film which is used. 10 15 20

It is apparent that the invention is not limited to the particular components described, but more sophisticated or streamlined configurations are possible and yet still remain within the scope of the invention. 25

What is claimed is:

1. A face mask comprising in combination:

- a. a hard hat;
- b. a brow guard coupled to said hat;
- c. a face shield of transparent material attached to said hat and extending across the front of said hat so as to allow vision by the wearer;
- d. a shroud coupled to said hat and extending downward from the bottom of said hat;
- e. a first and a second holder assembly, each coupled to one side of said face shield, each of 30 35 40

said holder assemblies comprising a first side and a second side, said first side being in closer proximity to said face shield, and extending vertically along the joinder of said two sides being a slot, each of said assemblies being open at the front, and having a top piece and a bottom piece, said bottom piece having a first tension button and a second tension button;

- f. a first and a second cutter bar, each having serrated edges and attached to each of said holder assemblies along the edge of said second side;
 - g. a first and a second cylindrical canister, each of said canisters being open at the top and bottom thereof and having a slot extending the entire vertical length of the canister, each of said canisters enabled to contain a roll of film, each of said canisters being held within its respective holder assembly between said first tension button and said top piece;
 - h. a first and a second roll of film;
 - i. means for inserting each of said rolls in its respective canister;
 - j. a first and a second roller, each of which is held in its respective holder assembly between said second tension button and said top piece;
 - k. means for pulling one of said rolls of film through said slot in its respective canister, under its respective roller, across said face shield, under the other of said roller and said canister, through said canister slot and aligned with the other of said cutter bars; and
 - l. ventilation means within said hard hat.
2. The face mask of claim 1 wherein said ventilation means comprises a plenum chamber having a quick disconnect insert tube and appropriately spaced apertures within said chamber for even distribution of air. 45 50 55 60 65

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