

[54] **COMPLETE HEAD COVERING FOR USE IN STERILE ENVIRONMENTS**

[76] Inventor: **Nathan L. Belkin**, 16 Panorama Dr., Huntington, N.Y. 11743

[22] Filed: **Nov. 8, 1972**

[21] Appl. No.: **304,620**

[52] U.S. Cl. **128/142.7; 2/173**

[51] Int. Cl. **A61b 19/00**

[58] Field of Search **128/142.7, 142.6, 142.5, 128/142.4, 142.3, 141, 146.2, 146.3, 146.7, 139; 2/2.5, 3 R, 9, 173**

References Cited

UNITED STATES PATENTS

1,184,785	5/1916	Stern	2/3 R
1,930,399	10/1933	Stelzner	128/142.6
2,262,522	11/1941	Yant	128/142.7
2,314,889	3/1943	Manson	128/142.7
2,446,530	8/1948	De Grazia	128/142.7
2,529,106	11/1950	Schauweker	128/142.5

3,625,206	12/1971	Charnley	128/142.5
3,625,207	12/1971	Agnew	128/146.2

Primary Examiner—Richard A. Gaudet

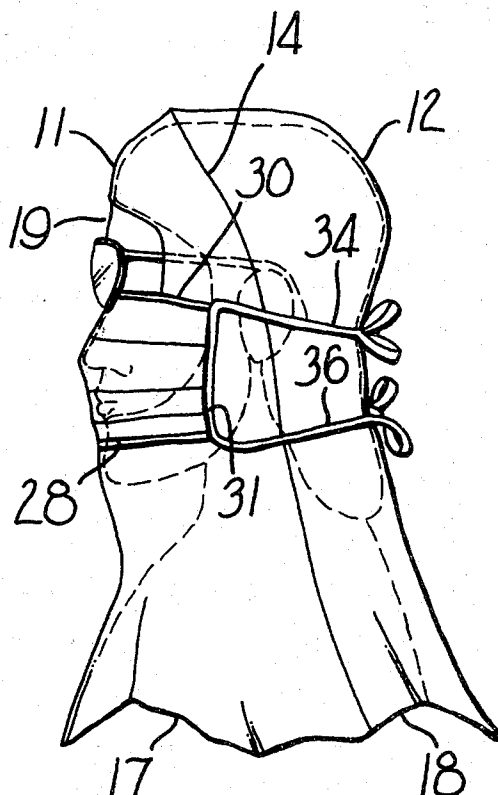
Assistant Examiner—Henry J. Recla

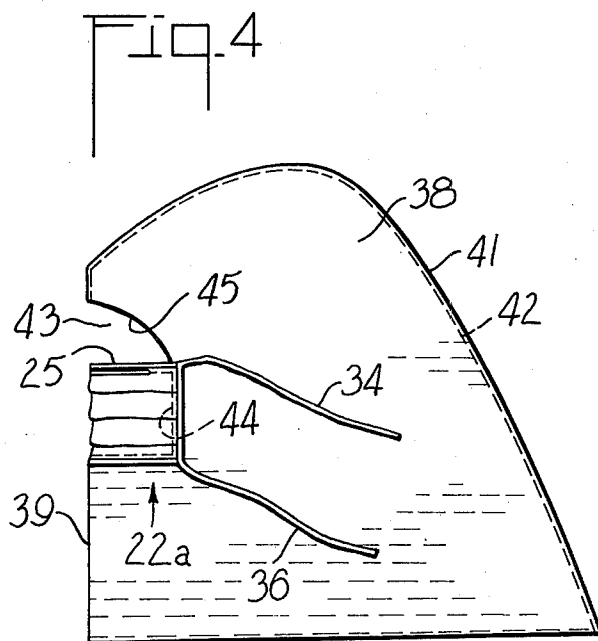
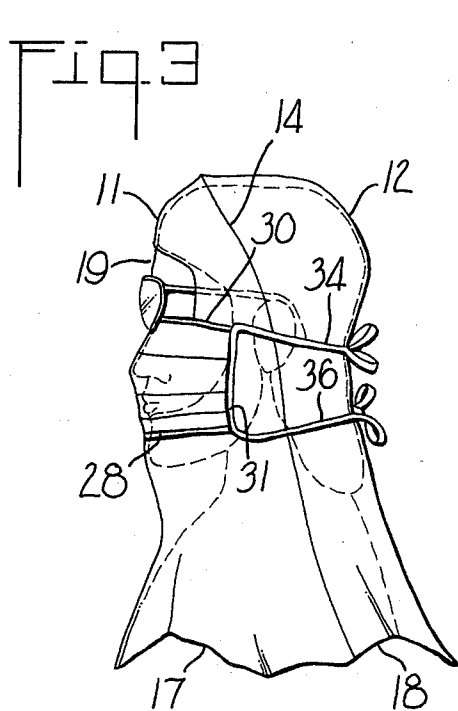
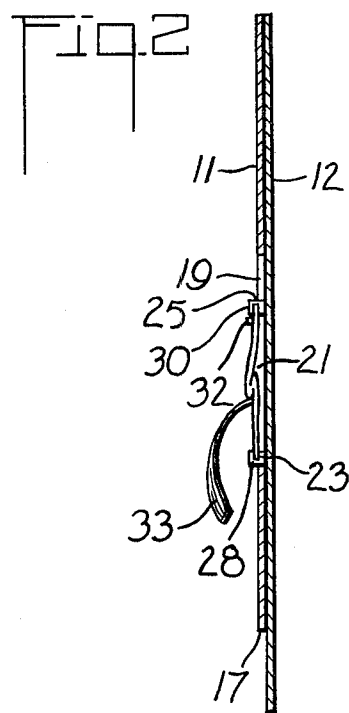
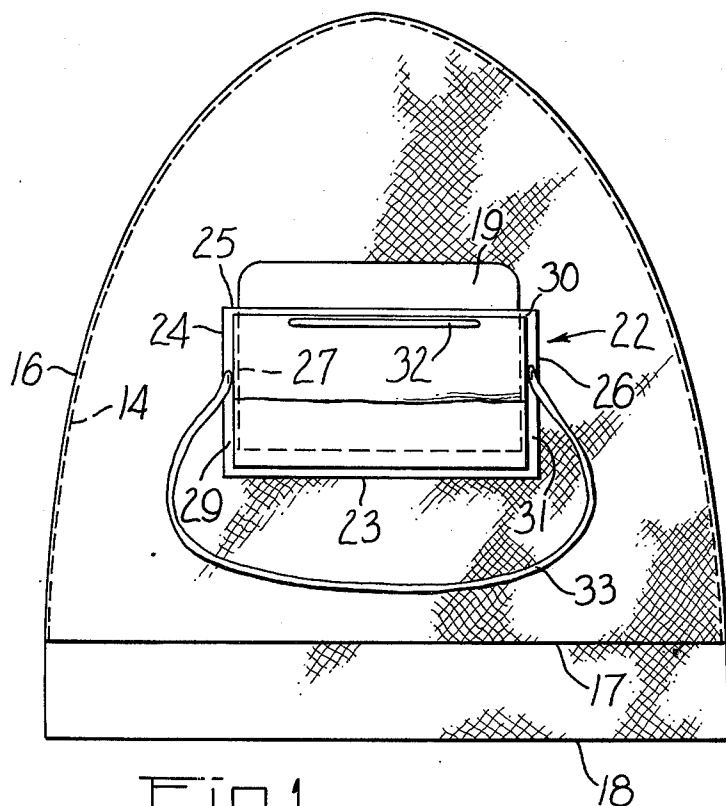
Attorney, Agent, or Firm—Donald P. Gillette, Esq.

[57] **ABSTRACT**

A head covering of two sheets, not necessarily separate, of material joined along all edges except the bottom to slip loosely over the wearer's head and provided with an opening for the wearer's eyes, nose, and mouth. A mask is attached to the head covering to cover the nose and mouth area and define the lower edge of the eye opening. One or more fasteners from opposite sides of the mask are adapted to be looped behind the wearer's head when the head covering is in place, thereby securing the mask snugly over the wearer's mouth and nose and simultaneously causing the head covering to be held in place over the wearer's head and hair.

16 Claims, 4 Drawing Figures





COMPLETE HEAD COVERING FOR USE IN STERILE ENVIRONMENTS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the field of head coverings for use in operating rooms and other environments that must be kept uncontaminated. In particular, it relates to a head covering that completely covers the wearer's hair, including facial hair and the currently popular long hair, and includes a mask to cover the wearer's nose and mouth and to provide loops to hold both the mask and the head covering snug against the head when in use.

2. The Prior Art

Heretofore persons working in operating rooms and other closed environments requiring minimum contamination have worn hair enclosures and separate masks over the nose and mouth. The head cover worn by men who do not have very long hair is known as the scotch type and is secured with strings. Women have worn a turban or helmet design held in place by either ties or elastic. Since many men now have long hair, a hood type of head covering has evolved to cover the scalp and hair as completely as possible.

Even this is not enough in the case of a man with a beard. That, too, must be completely protectively covered. The imperatives of aseptic technique cannot distinguish hair on one part of the head from hair on another part.

Face masks are still obligatory for all those working in such environments. The purpose of the face mask is to filter organisms exhaled by the wearer so that these organisms cannot reach the sterile environment. The effectiveness of the mask as a filter is reduced if it becomes moist, and it then acts as a bacterial trap. In fact, it may actually become more of a hazard than a protective device. For this reason, masks should always be discarded by persons leaving the sterile environment. A mask should never be worn hanging around the neck or carried in a pocket. No mask should ever be re-applied, even temporarily, after it has been removed.

Unfortunately, these rules are frequently forgotten. Even highly-trained operating room personnel become lax in observance of these rules. Masks are temporarily slipped off for a moment's respite and then are re-applied. There may be no intent to break the rules of sterile procedure, but the rules are broken as effectively by forgetfulness as by deliberate intent.

It is an object of the present invention to provide a complete head covering that encloses the wearer's head entirely, except for the eyes, and incorporates a surgical mask in the proper area to cover the wearer's nose and mouth.

Another object is to provide a unitary head covering that will not be worn outside the sterile area and cannot be as easily removed as a face mask alone so that, once removed, it is not likely to be put back on.

A further object is to provide loop means attached to the mask portion to encircle the wearer's head and draw the mask portion into close fit around the wearer's nose and mouth while holding the entire head covering in place, as required by the rules of aseptic technique.

A still further object is to provide a mask with the required features embodied in a garment so simple that, if made of reusable material, it can be easily cleaned

and resterilized, or, if made of disposable material, it will be so inexpensive that it can be discarded after a single use.

BRIEF DESCRIPTION OF THE INVENTION

The head covering of this invention comprises two sheets of suitable material, which may be reusable or disposable, and may consist of separate sheets or of two symmetrical parts of a single sheet folded together. The peripheries of the two sheets are joined together except for a section that forms the bottom part of the head covering and may be spread apart so that the garment can be drawn over the wearer's head. At a suitable location in the material an opening is made to form an open eye slot so as not to obstruct the wearer's vision, even if he or she is wearing glasses.

Immediately below the eye slot is a surgical mask, the upper edge of which forms the bottom edge of the eye slot, and the sides and lower edge of which are secured to the material forming the head covering.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of one embodiment of a head covering according to the invention. FIG. 2 is a cross-sectional view of the head covering in FIG. 1 taken along the line 2-2.

FIG. 3 shows the head covering similar to that of FIGS. 1 and 2 as it appears in use.

FIG. 4 is a side view of another embodiment of a head covering according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

The head covering in FIGS. 1-3 comprises a front panel 11 and a back panel 12 formed of a suitable material, such as a lightweight, non-woven material joined together by a seam 14 along the upper perimeter 16. The bottom edges 17 and 18 of the panels 11 and 12 are not joined and can, therefore, be pulled apart to allow the head covering to be put on.

In the central region of the front panel 11 is an opening 19 large enough to encompass at least the wearer's eyes. A lower opening 21, or a lower part of the opening 19, is covered by a mask 22. At least the lower edge portion 23 of the mask 22 is attached to the panel, for example, by being stitched or glued thereto. Preferably the sides 24-26 are also attached to the panel 11. A narrow strip 27 between the openings 19 and 21 allows the upper side 25 of the mask to be attached. The particular mask shown has a binding 28-31 that defines its four edges, and this binding may be used as the area of the mask 22 that is to be secured to the panel 11. It is desirable to join the mask to the panel without leaving any substantial gaps along the sides 24 and 26 and the lower edge 23.

It is preferable from a manufacturing point of view to form only the opening 19 initially. After the mask 22 has been attached to the panel 11, the lower opening 21 may be cut out in such a way as to leave the narrow strip 27 directly behind the upper binding 30. The reason for forming the openings in this way is to facilitate attachment of the mask 22 to the panel 11. However, if the upper side 25 is not to be attached to the panel 11, the opening 19 may simply be made large enough to include the opening 21 and the area of the strip 27.

Near the upper edge 25 of the mask 22 is a deformable strip 32 of metal that can be shaped to fit over the bridge of the wearer's nose. An elastic strap 33 may be

stapled or otherwise suitably attached to the strips of binding 29 and 31, and when a user puts the head covering on, he loops the elastic strap over his head to hold the mask and the entire head covering firmly in position.

FIG. 3 shows an alternative embodiment similar to the one in FIGS. 1 and 2 except that the head covering is held in place by ties instead of an elastic band. As may be seen in FIG. 3, the opening 19 above the mask 22 is large enough not to obscure the wearer's vision. In particular, the opening must be large enough not to interfere with the wearing of eyeglasses or even clipped-on magnifying lenses. The lower opening 21 must be large enough not to interfere with breathing.

The side binding 31 is extended to form one set of ties 34 and 36. The opposite side binding is similarly extended to form a second set of ties (not shown) to be tied behind the wearer's head to hold the mask against the wearer's face and to help keep the head covering in place. Shaping the strip 32 to conform to the bridge of the wearer's nose may make it unnecessary to have two sets of ties 34 and 36 and, in particular, to do away with the upper tie 34 leaving only the lower tie 36. However, two sets of ties are preferred.

FIG. 4 shows another embodiment of a head covering according to the invention. In this embodiment, the main part of the material is formed into left and right side panels of which only the left side panel 38 is shown. These two side panels are formed out of a single piece of woven or non-woven material, which may be of the same type used in making the head coverings in FIGS. 1-3 and folded together along the central part of the front on a line 39. The left and right side panels are cut so as to fit entirely over the head of the wearer and to extend down the wearer's back far enough to enclose hair of any reasonable length. The edge 41 may be joined by adhesive material or stitched together in the region 42. A slightly different type of mask 22a is used in this embodiment, but this mask is still placed so that its upper edge 25 forms the lower edge of a slot 43 through which the wearer can see, and, like the mask 22 in FIGS. 1-3, it includes filter material that covers the wearer's nose and mouth. An opening 44 is cut in the panel 38 and its matching panel to a void interference with the wearer's breathing.

In forming the slot 43, the panel 38 and the matching panel directly behind it are cut along a curved line 45. The purpose of this curved line is to avoid cutting the material along its grain pattern. This is particularly important if a non-woven, disposable material is used. Such material usually comprises fibers that all extend more or less in one direction. These fibers provide sufficient strength to make it difficult to tear the material perpendicular to the longitudinal direction of the fibers; but since there are no cross fibers as there would be in woven material, it is relatively easy to tear the non-woven material parallel to the longitudinal direction of the fibers. By providing a curved edge 45, it is possible to avoid having any substantial part of the edge and particularly any sharp corner coincide with the longitudinal direction of the fibers. Thus, the head covering is much less subject to be torn. This curved edge of the opening 42 can also be used for the opening 19 in the head coverings in FIGS. 1-3.

The mask 22a may be provided with an elastic strap, such as the strap 33 in FIG. 1, but it is shown as being provided with ties 34 and 36. These may be tied behind

the wearer's head to hold both the mask and the head covering in place in the same way as the ties 34 and 36 in FIG. 3.

What is claimed is:

1. An inexpensive, disposable head covering for sterile environments, said head covering comprising:
 - A. first and second sheets of material joined together along their peripheries, except along a bottom edge, to form an enclosure large enough to be placed over a wearer's head with said bottom edge reaching wearer's shoulders;
 - B. an opening in said material; and
 - C. a face mask of filter material having an upper edge spaced from the upper edge of said opening defining the boundaries of an eye slot, and having a lower edge secured to the lower edge of said opening, and closure means attached to the respective side edges of said mask adapted to be looped behind said head covering to hold the mask securely over the wearer's nose and mouth and to hold the head cover in place on the wearer.
2. The head covering of claim 1 in which said mask is attached to the outer surface of said material and said closure means is also outside of said enclosure.
3. The head covering of claim 1 in which said opening extends over an area including the eyes, nose, and mouth of the wearer.
4. The head covering of claim 3 in which side portions of said mask are attached to said material on each side of said opening.
5. The head covering of claim 1 comprising, in addition, a second opening below said first-named opening and spaced therefrom by a strip of said material, and covering the nose and mouth of the wearer, the perimeter of said mask being attached to said material defining the perimeter of said second opening.
6. The head covering of claim 2 in which said closure means comprises ties extending from the sides of said mask to be tied together to form a loop.
7. The head covering of claim 2 in which said closure means comprises an elastic band, both ends of which are attached to the ends of said mask.
8. The head covering of claim 7 in which said ends of said elastic band are each stapled to one end, respectively, of said mask.
9. The head covering of claim 2 in which said mask comprises:
 - A. a top binding strip defining the lower edge of said eye slot; and
 - B. a bottom binding strip, and said closure means comprises extensions of said binding strips to form ties that extend around the back of the wearer's head.
10. The head covering of claim 9 in which said extensions extend from both ends of each of said binding strips.
11. The head covering of claim 1 in which said sheets are two parts of a single piece of material folded together.
12. The head covering of claim 11 in which:
 - A. said eye slot is located in said first sheet substantially midway between sections of said periphery joining said top section and said bottom edge; and
 - B. the periphery of said mask is attached to the outer surface of said first sheet and positioned so that the upper edge of said mask forms the lower edge of said eye slot, the area of said first sheet covered by

5

the central part of said mask being open to the nose and mouth of the wearer.

13. The head covering of claim 1 in which said sheets are two parts of a single piece of material folded to define an edge section of said peripheries adjacent said bottom edge.

14. The head covering of claim 13 in which said opening is cut into said edge section symmetrically in both of said sheets.

6

15. The head covering of claim 1 in which said mask is substantially rectangular and the bottom edge and both side edges thereof are glued to the outer surface of said material.

16. The head covering of claim 1 in which said mask is substantially rectangular and the bottom edge and both side edges thereof are sewn to the outer surface of said material.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65