

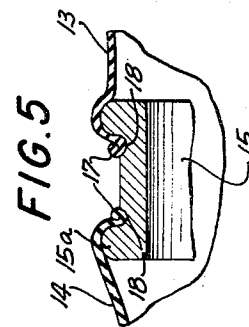
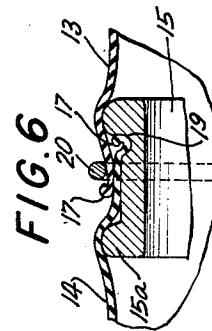
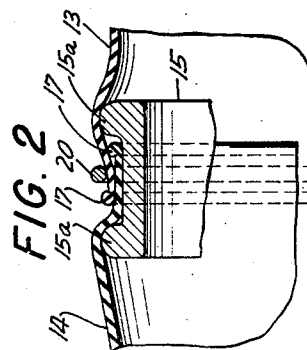
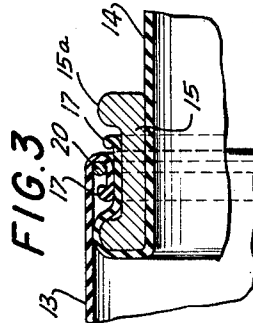
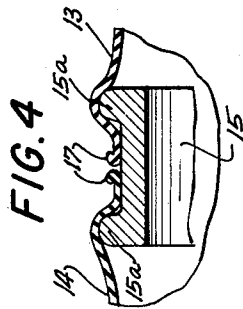
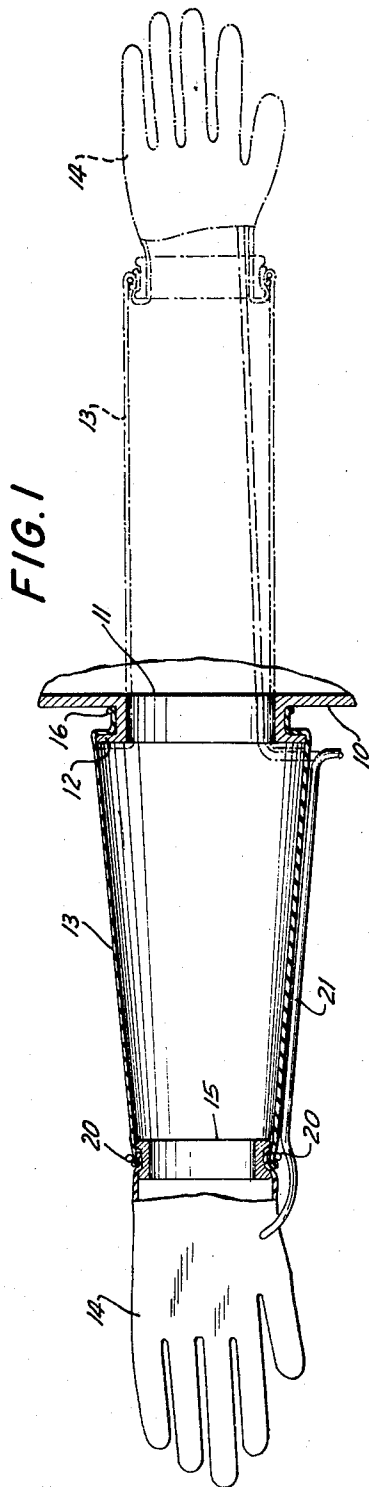
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GLOVE ASSEMBLY

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GLOVE ASSEMBLY

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This invention relates to a structurally and functionally improved glove assembly for use in connection with enclosures or casings providing, for example, incubator structures such as are employed in hospitals, or electronic, nuclear, bacteriological, industrial research and laboratory installations within which materials and/or gases are present with which the hands of an operator should not come into contact, even although that operator is required to manipulate parts or materials within the enclosure.

By means of the present teachings a glove assembly of improved design is provided; that design assuring maximum hand protection with full finger dexterity while permitting ready replacement of damaged parts of the assembly without it being necessary to substitute an entirely new unit in lieu of an assembly in which only one part is damaged.

Further objects are those providing an assembly in which a structure free from leaks is present, and which structure will be maintained, despite the fact that parts of the assembly may be quickly replaced when necessary; structures within the scope of the present teachings assuring against the ingress or egress of vapors or gases to or from an enclosure, respectively.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention, and in which:

FIG. 1 is a sectional side view showing a glove assembly applied to a casing or enclosure provided with a conventional access opening;

FIG. 2 is a fragmentary enlarged sectional view showing adjacent parts of the assembly in their normal or inoperative condition;

FIG. 3 is a similar view showing those parts in operative condition; and

FIGS. 4, 5 and 6 are views similar to FIG. 2, but showing alternative arrangements for coupling the several parts together.

Referring primarily to FIG. 1, the numeral 10 indicates the wall of a dry box or other enclosure having an opening 11, which is defined on the outer face of the wall by a preferably flanged collar 12. The glove assembly is applied to this collar and closes opening 11 against the entrance of atmosphere or the escape of gases and vapors from the enclosure. That assembly also permits the operator, without exposure of his hand or arm to the space within the enclosure, to manipulate parts and materials therein.

The assembly will include, as shown in full lines in FIG. 1, a sleeve 13 and a hand-covering part 14. The latter will usually—as shown—embrace a complete glove providing finger and thumb-receiving parts as well as a wrist portion. While various materials may be employed to furnish the sleeve and glove, these will ordinarily be made of a latex or suitable synthetic base. The assembly additionally includes a ring 15 having inner and outer edge surfaces, with the former defining a space adequate for the passage of the operator's hand.

That end of the sleeve which is connected with collar 12 preferably terminates in a bead 16, which may simply constitute a thickened area of the sleeve adjacent its edge. Of course, if desired, a separate constrictable element might define this edge zone and be suitably coupled therewith. In any event, the diameter defined by

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the inner end of this sleeve will be less than the diameter of collar 12. Accordingly, the inner edge zone of the sleeve may be stretched to encircle the collar and may have its peripheral portion resting against and in sealing contact with the surface of the trough or groove defined by the flange of the collar.

As shown particularly in FIG. 2, ring 15 has the ends of its outer edge surface defined by flanged or raised portions 15a. The ring may be round or oval and formed, for example, of plastic or a lightweight metal. The adjacent edge zones of both the sleeve and hand-covering part will preferably include beads 17 corresponding to the bead 16. Due to the elasticity of the material and these beads, the edge zones will constrict into the groove defined between flanges 15a of the ring. In this manner an effective vapor seal is established between the glove and the sleeve.

That seal is rendered even more effective where the edge zones of the adjacent ends of the glove and sleeve are overlapped, as shown in FIG. 2, with the material of the hand-covering part confined within this zone by the material of the sleeve. The interior of the cabinet or enclosure being under pressure, in accordance with conventional practice, it follows that the glove assembly will normally extend outwardly from the wall of the enclosure, as shown in full lines in FIG. 1. The entire assembly will be supported by the collar 12 or its equivalent, and the sleeve will be connected with the glove part, as aforescribed, by the ring.

A technician using the assembly will merely oppose his hand to the covering part 14, in accordance with usual technique. If finger and thumb portions are included in the glove, he will apply his fingers and thumb accordingly and project his hand through the opening defined by ring 15, with consequent inverting of the glove through that opening to dispose the wrist portion thereof in contact with the inner edge surface of the ring. With continued projection, his hand, protected by the glove, will pass through the opening 11, and the glove assembly may then be extended, if desired, to the position indicated in dot-and-dash lines in FIG. 1. So arranged, his arm will be protected by sleeve 13. No contact will occur between his wrist zone and ring 15, because the adjacent glove layer will bear against the inner edge surface of the ring, as shown in FIG. 3.

While in many respects it is preferred to use a ring embracing a structure as shown in FIGS. 2 and 3 and to have the edge zones adjacent the open ends of the hand covering and sleeve overlapped, as in those figures, other arrangements may be resorted to. For example, as in FIG. 4, employing a ring of the same design, the beads 17 of parts 13 and 14 may be spaced from each other within the channel defined between the flanges 15a. The position illustrated in FIG. 4 is the inoperative condition of the parts, as shown in full lines in FIG. 1. It is apparent that as the technician or operator applies his hand to the covering 14 and projects the latter through the opening of the ring 15, the wrist zone of this covering will be inverted and will extend around the rear and inner edge surface of the ring in a manner similar to that illustrated in FIG. 3. Again, his hand will be protected from direct contact with the ring. Continued projection will cause the sleeve 13 to invert or be turned upon itself.

The same results are obtainable by the structures shown in FIGS. 5 and 6. Both these views again illustrate the inoperative condition of the assemblies. In the first, the trough portion between the flanges 15a of the ring 15 is provided with grooves 18, preferably adjacent those flanges. Under certain conditions, a more desirable form of seal is achieved by such a construction. Also, even under severe strains, the parts will not acci-

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dentally separate. The same principle is employed in the structure shown in FIG. 6, in which, however, the hand-covering portion 14 adjacent its bead 17 is enclosed and overlapped by the end zone of the sleeve 13. A single groove 19 may be utilized, within which the bead of the hand covering 14 lies.

In order to provide a more positive seal between sleeve part 13 and glove part 14, particularly when there is an increased pressure differential between the associated enclosure and surrounding atmosphere, an overlying constrictable and seal-assuring element, such as an "O" type ring 20, may be provided, as shown in FIGS. 1, 2, 3 and 6. There may also be provided with the structures shown in FIGS. 1 through 6 an air tube 21, as shown in FIG. 1. Such tube, when attached to an appropriate air supply, provides a gentle forced circulation of air into and out of the glove-sleeve assembly during its use whereby the likelihood of hand and arm perspiration is reduced. Such perspiration, if allowed to occur, may (in time) permeate the assembly and upset the nature of the environment within the enclosure.

It will be apparent that by structures as disclosed and heretofore described, a desirable assembly is furnished. The hand-covering or glove part 14 may be manufactured separately from the sleeve 13. The elements do not have to be bonded together. In the event of damage to one part, that part may readily be removed from the assembly and replaced. This may be achieved with the expenditure of minimum time and effort. With such replacement, the user is assured that a satisfactory seal will exist between the interior of the compartment or box 10 and the outer atmosphere.

Thus, among others, the several objects of the invention as specifically aforementioned are achieved. Obviously, numerous changes in construction and rearrangements of the parts may be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. A combined glove and sleeve for dry box work comprising: a tapered frusto-conical tubular sleeve having a first and second open end and through which a glove is projectible, means for connecting said first open end to a dry box, a flexible, detachable glove including a

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hand-covering part and a wrist portion presenting a third open end, a supporting ring over which the edge zones defining said third open end of the glove wrist portion and the edge zones defining the second open end of the sleeve are telescoped in overlapping sealing relationship, said sleeve and glove extending in opposite directions from said ring, said sleeve and glove being flexible to permit said glove to be projected inwardly from a first portion into said ring, outwardly through said sleeve first end and into a second position for dry box work, means for detachably connecting said glove and said sleeve on said ring to permit replacement of the glove, said glove when in said second position, covering interior surfaces of said ring, and said sleeve, when in said second position, being in substantial concealing relationship around said detachable connecting means.

2. In a structure as defined in claim 1, flanges extending outwardly from said ring adjacent its side edges, the open edge zones of said glove wrist portion and the second open end of said sleeve, each enveloping one of the ring flanges and thrusting in sealing relationship against the ring surface intervening said flanges.

3. In a structure as defined in claim 1 and ventilating means for said structure comprising a tube connected to said glove for the discharge of air into its interior.

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