April 10, 1956 F. G. LA VIOLETTE 2,741,410

METHOD AND APPARATUS FOR HANDLING CONTAMINATED GLOVES

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Fig. 1.

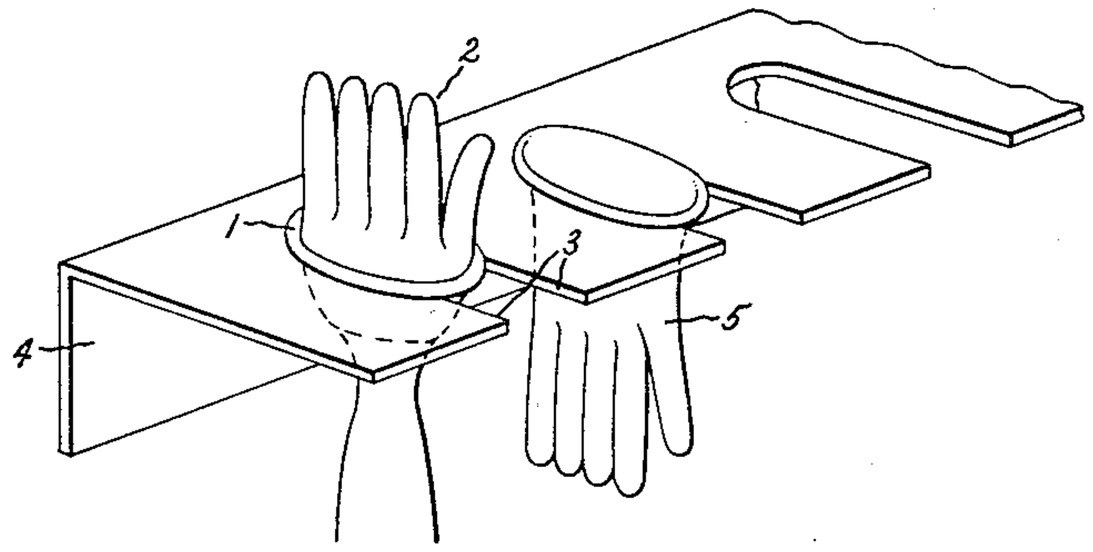
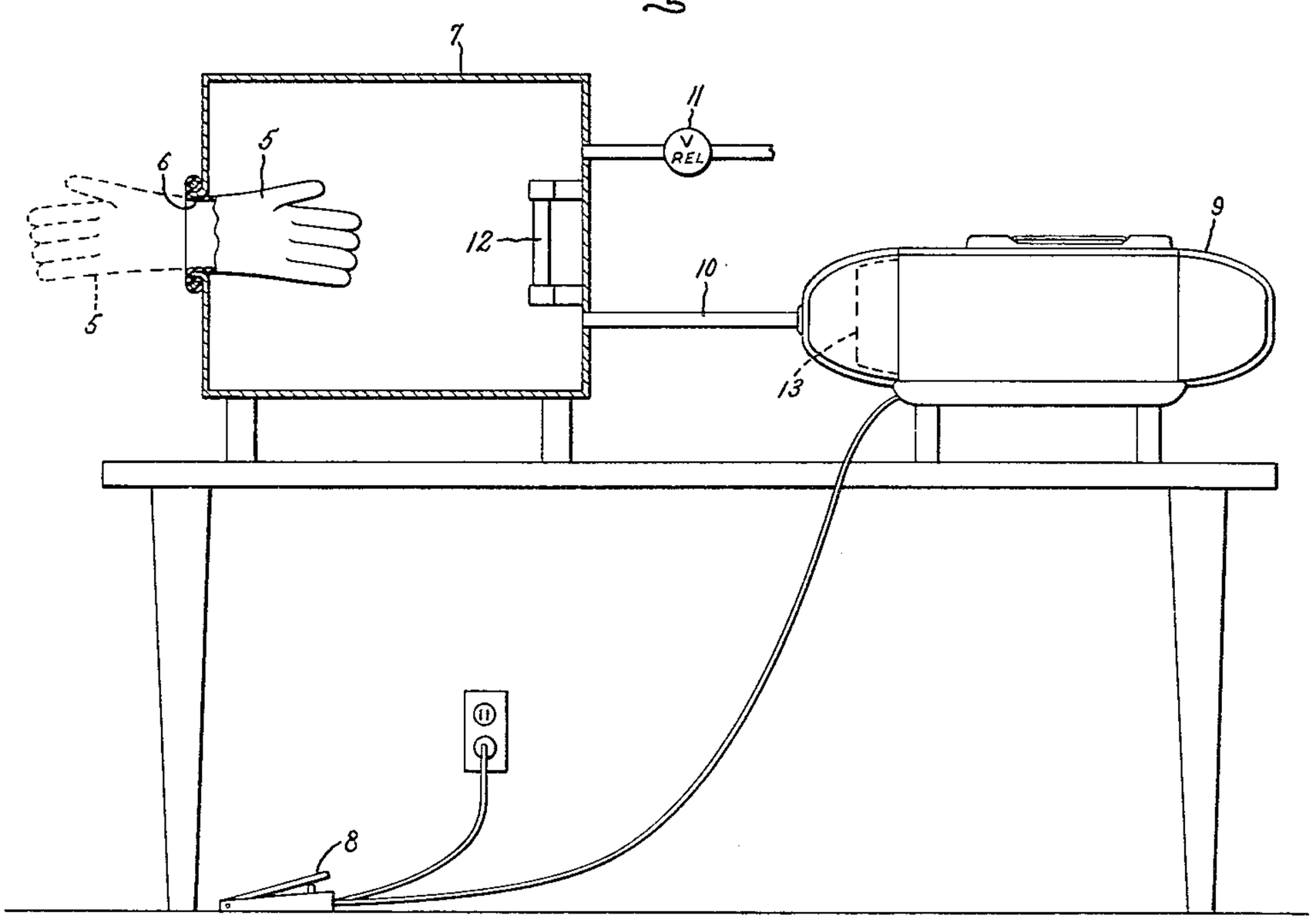


Fig. 2.



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METHOD AND APPARATUS FOR HANDLING CONTAMINATED GLOVES

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2 Claims. (Cl. 223—111)

The present invention relates to the field of radioactive materials and its object is to provide an apparatus and method for handling gloves or similar articles used in operations requiring unusual precautions to avoid contamination, as for example, gloves worn by workers in plants or laboratories engaged in operations in which the interior surfaces of gloves should be carefully guarded from contacts with chemicals and particularly from contamination with radioactive materials, or gloves worn by surgeons which must be kept sterile.

Gloves of rubber, or other suitable protective materials, are worn by workers who handle materials which emit dangerous radiations, for example alpha radiation or soft beta radiation. In spite of extraordinary care being taken, traces of radioactive substances may adhere to the external surfaces of gloves used under such conditions. When such contaminated gloves are used repeatedly by a worker, some contamination may accidentally be transferred to the internal surface of the gloves, and may thus come in contact with his skin. This undesired result may occur should a worker strip off or put on a glove on one hand by the help of his other hand on which an externally contaminated glove was being worn.

As a result of the present invention, the likelihood of accidental spread or transfer of radioactive contamination is reduced by reenforcing the wrist portions of gloves worn by workers so that each of the gloves can be stripped mechanically from the hand on which it is worn without manual assistance, thereby avoiding contact with the internal surfaces of gloves which come into direct contact with the hands of users. As a second feature of this invention, means is provided for automatically righting such gloves.

The accompanying drawing shows in Fig. 1 a glove rack provided with apertures for engaging with a stiffened wrist portion of gloves and Fig. 2 is a perspective view of a glove rectification and inflation compartment.

As shown in Fig. 1 of the drawing, gloves to be handled in accordance with the present invention are provided with a reinforcement at the wrist band which may take the form of a ring or stiff wire about which the glove material is sewed. When the wrist band 1 of a glove 2 engages with the sides of an open aperture 3 of the glove rack 4 and the hand is withdrawn, the glove will be stripped from the hand on which it was worn and will be turned inside-out. The gloves are permitted to remain on the rack 4 as indicated by the glove 5 which hangs suspended in one of the rack apertures. From this inverted state the gloves are returned to their normal state (right-side out) by air suction without being handled.

To bring about the desired reversion to normal, the expanded ends of the respective gloves are held over an opening 6 in a container, as shown in Fig. 2. A subatmospheric pressure is maintained in the container by a vacuum pump 9 whereby the inside-out position of the gloves is reversed by suction without the exterior surface of the gloves being touched by either hand. The operator desiring to use a glove 5 which has been turned inside-out (shown in dotted outline) holds the wrist band over the opening 6 in the glove tank 7, touching only the exposed surface of the glove, that is the surface which normally is an inside surface. By means of a foot-operated switch 8 a motor (not shown) in the vacuum apparatus 9 is started, thereby withdrawing air from the tank 7 by the conduit 10. The higher external atmospheric pressure causes the glove 5 to be pushed right side out into the tank 7 where it may remain in an inflated position ready for use or a hand may be slipped immediately into it without difficulty. The tank may be provided with more than one opening for the righting of gloves stripped inside-out from the hands of workers.

In order to prevent excessive expansion or "ballooning" of the glove by undue reduction of pressure in the glove tank, a relief valve 11 is provided whereby the tank interior is maintained automatically below a predetermined limiting pressure below atmospheric pressure which is adapted to expand a glove without expanding it excessively.

In some cases, for example, when gloves to be used for surgical purposes are to be held ready for use in the tank 7, a sterilizing means may be provided therein. The drawing shows a sterilizing mercury vapor lamp 12 as an example of such means. A removable filter 13 may be provided adjacent the outlet of the conduit 10 to exclude radioactive dust from the vacuum apparatus.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. The method of handling a glove after an operation during which said glove is worn on a hand and the external exposed surface of said glove is subject to contamination, which method consists of the following steps in succession: mechanically engaging and retaining by an apertured rack a wrist portion of said glove, stripping said glove from the hand by relative movement of the hand and said rack, thereby turning said glove inside-out, supporting said glove against a barrier wall defining an opening therein with the wrist portion of said glove symmetrically disposed about the opening, applying suction to the exposed surface of said glove until the inside-out condition thereof has been reversed, and maintaining said glove in an expanded state by maintaining air pressure upon the exposed surface thereof sufficiently lower than the air pressure exerted by the atmosphere upon the internal surface to hold said glove expanded and ready for reinsertion of the hand of one desiring to use said glove.

2. A glove handling apparatus comprising the combination of a rack and a tank, said rack including a wall having a free edge and defining a wrist shaped aperture communicating with said free edge, said wall being proportioned about the aperture to engage with a reinforced marginal portion of said glove, thus permitting said glove to be stripped in an inside-out position from the hand; said tank having a wall defining an aperture corresponding to the aperture in the wall of said rack, said tank having means for reducing air pressure in said tank whereby the inside-out position of said glove may be reversed by holding said rack against said tank with the wrist portion of said glove registered between said walls of said rack and said tank and symmetrically disposed about the apertures defined by said walls.

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