July 24, 1934. P. L. BUNN 1,967,704

METHOD OF AND APPARATUS FOR MOLDING ARTICLES FROM FIBER

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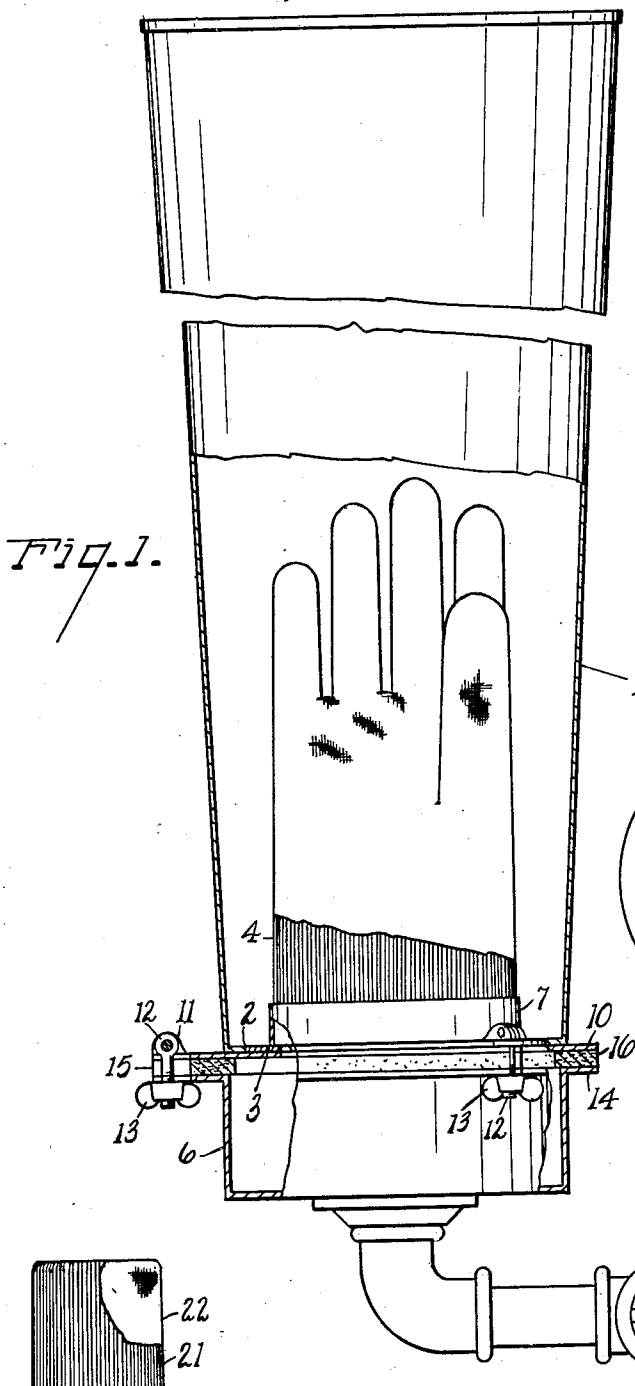


Fig. 1.

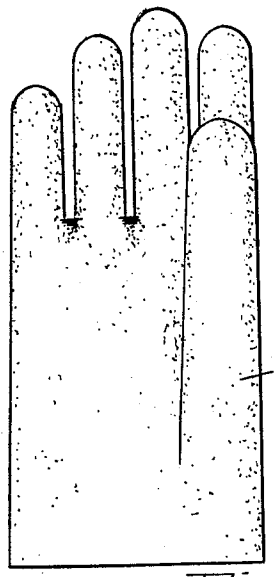


Fig. 9.

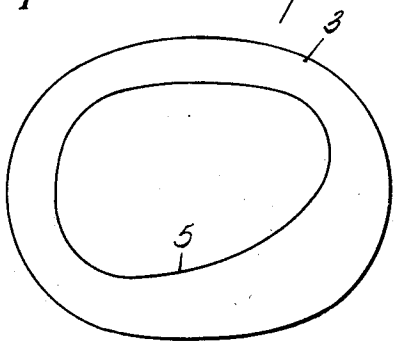


Fig. 4.

Fig. 10.

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Fig. 2.

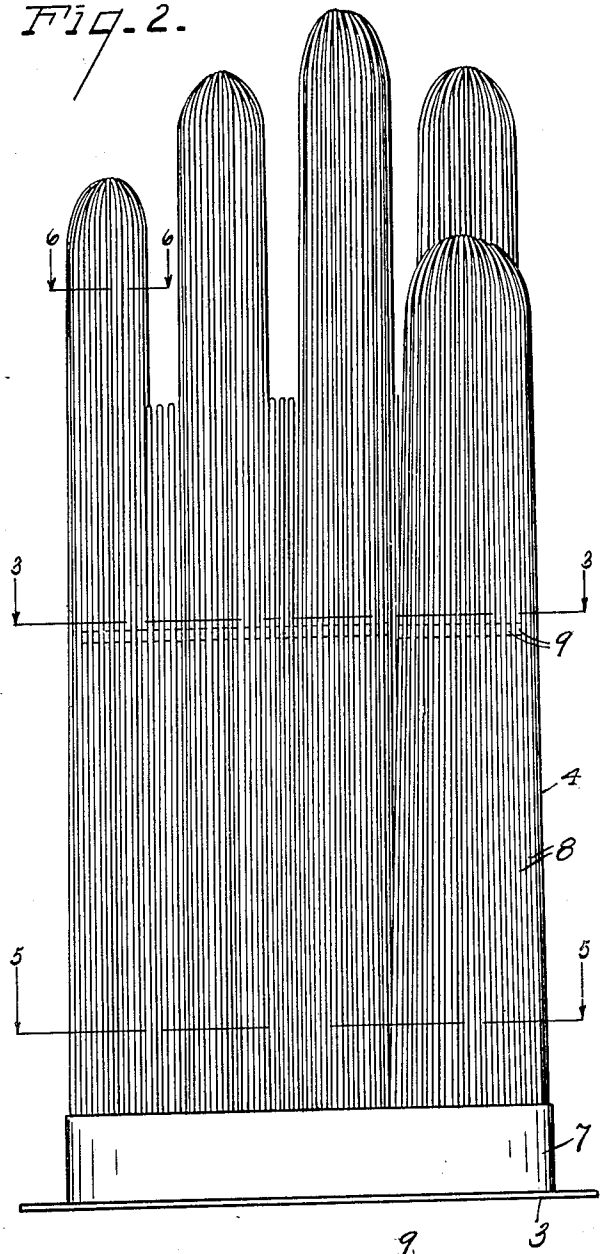
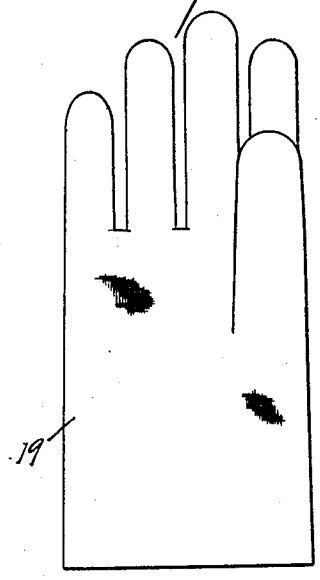


Fig. 8.



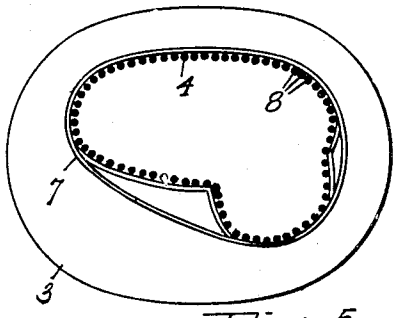


Fig. 5.



Fig. 6.



Fig. 7.

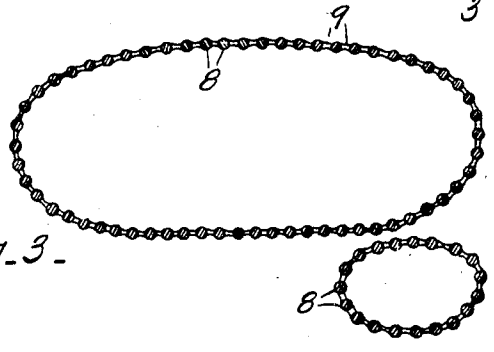


Fig. 3.

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Patented July 24, 1934 1,967,704

UNITED STATES PATENT OFFICE

1,967,704

METHOD OF AND APPARATUS FOR MOLDING ARTICLES FROM FIBER

Percy L. Bunn, Three Rivers, Mich.

Application June 24, 1932, Serial No. 619,063

12 Claims. (Cl. 92—57)

The main objects of this invention are:

First, to provide an improved apparatus for molding articles from pulp or paper stock.

Second, to provide an apparatus of this character which is well adapted for the making of seamless gloves from fiber or paper stock.

Third, to provide a method of manufacturing seamless articles from paper stock or fiber which results in a highly satisfactory product and enables rapid production of the desired articles, such as gloves, cups, dishes or the like.

Objects pertaining to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

The manner of carrying out my invention is clearly illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary view partially in vertical section of an apparatus embodying my invention designed for the manufacture of gloves.

Fig. 2 is an enlarged side elevation of the mold.

Fig. 3 is a horizontal section through the mold on a line corresponding to line 3—3 of Fig. 2.

Fig. 4 is an inverted plan view of the bottom plate of the mold.

Fig. 5 is a reduced horizontal section of mold on a line corresponding to line 5—5 of Fig. 2.

Fig. 6 is an enlarged section on line 6—6 of Fig. 2.

Fig. 7 is an enlarged fragmentary sectional view of the mold showing structural details thereof.

Fig. 8 is a front elevation of the fabric covering for the mold.

Fig. 9 is a front elevation of a completed glove.

Fig. 10 is a side elevation of a mold embodying my invention adapted for the forming of paper cups or receptacles.

In the embodiment of the invention illustrated in Figs. 1–9, inclusive, of the drawings 1 represents a receptacle or container for the prepared fiber or paper stock which is suitably diluted with water and introduced into the container in thoroughly mixed condition, that is, with the fiber as uniformly distributed as possible in the vehicle. The container has an opening 2 for the base plate 3 of the mold designated generally by the numeral 4. This base plate 3 is provided with an opening 5 communicating with the suction chamber 6.

The opening 5 is surrounded by an upstanding flange 7. A plurality of spaced wires 8 are mounted on this flange or extend upwardly therefrom. These wires are arranged to conform to the outline of a hand or glove and constitute the foundation for a fabric glove-shaped covering 19. The body of the mold is tapered upwardly as are also the fingers and thumb. The thumb and upper ends of the rods 8 converge to the tips of the thumb and fingers and are welded together at these points. The rods are fixedly supported in spaced relation by the spacers 9 preferably welded to the rods, see Fig. 7.

The receptacle 1 is provided with an annular bottom flange 10 provided with lugs 11 to which are pivoted the clamping bolts 12. These bolts 12 are provided with wing nuts for releasably clamping the flange 10 to the annular flange 14 at the upper end of the suction chamber 6. The flange 14 is provided with radial slots 15 into which the bolts may be swung as shown in Fig. 1. A sealing gasket 16 is disposed between the flange 10 of the container and the flange 14 of the suction chamber.

A conduit 17 having a valve 18 is connected to the bottom of the suction chamber, this conduit leading to a suction pump or suitable source of vacuum not shown.

The fabric covering 19 is adapted to be slipped upon the mold, this covering being of suitable weave to permit free passage of water therethrough. The mold being formed of longitudinal or vertical rods or wires permits the covering to be freely slipped thereon or removed therefrom.

In operation the container 1 is filled with the diluted pulp or paper stock and the valve 18 opened, thereby creating suction within the mold which rapidly draws the water through the covering and the mold, leaving the fibers on the surface of the covering 19. It is contemplated that in ordinary practice the container is of such size as to contain a sufficient amount of the diluted stock to form an article of the desired thickness.

It is found that owing to the rapid and uniform discharge of the water the fiber is uniformly deposited on the covering. After exhausting or withdrawing the water the covering is removed and placed in a suitable drying chamber. After the drying operation the covering is withdrawn from the finished glove 20. It is evident, of course, that the article may be dried on the form.

The device may be used without suction, that is, by simply opening up the bottom of the con-

tainer and allowing the escape of water by gravity. However, the forming operation is speeded up and for some purposes a superior article results when force is applied in the withdrawal of the water. In Fig. 10 I illustrate a form adapted for the making of receptacles. This consists of a form 21 adapted to receive a covering 22. This is shown in reduced or diminutive size and it will be understood that it may be of any desired size. The method is desirable for making paper cups, dishes and formed articles other than gloves.

The apparatus is simple and economical in its parts and very durable. Gloves may be produced which are quite strong and suitable for emergency use, for example, by autoists in changing tires and performing other labor in which it is desired to protect the hands.

I have illustrated and described my improvements in an embodiment which I have found very practical. I have not attempted to illustrate or describe other embodiments or adaptations which I contemplate as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. Apparatus for making molded paper gloves and like articles comprising a container for liquid pulp having an opening in the bottom thereof, a mold inciuding a wire form of the glove to be molded mounted above said opening, the wires being arranged in spaced vertical relation, a removable porous collapsible covering on said form, and means for reducing the pressure below said opening for quickly drawing the liquid pulp through the walls of said mold to leave the fibers on the outer surface of the covering.

2. Apparatus for making molded paper gloves and like articles comprising a container for liquid pulp having an opening in the bottom thereof, a mold including a wire form of the article to be molded mounted above said opening, the wires being arranged in spaced vertical upwardly converging relation, and a flexible textile fabric glove on said form.

3. An integral one-piece flexible paper glove without joints or seams.

4. A one-piece seamless paper glove.

5. As an article of manufacture, a glove of paper stock fiber constituting a seamless unitary structure.

6. Apparatus for making seamless paper gloves, comprising in combination a plurality of upstanding spaced wires arranged to conform to the outline of a hand and tapered upwardly to converge at the tips of the fingers and thumb, a cloth glove arranged on said hand, the parallel arrangement of said wires facilitating the movement of the cloth glove on and off of said hand, and means for passing the fiber stock through said cloth glove whereby the fibers are deposited on the outer surface thereof to form a one-piece seamless paper glove, the cloth glove being collapsible for ready removal from the inside of the paper glove without injury to the latter.

7. Apparatus for making seamless paper gloves, comprising in combination a hollow hand having walls provided with longitudinal openings for the passage of the fluid paper stock, the fingers being arranged in parallel relation, a collapsible fabric glove arranged on said hand for sliding movement thereon and thereoff, and means for passing the fluid paper stock through said fabric glove to form a one-piece paper glove on the outer surface thereof.

8. Apparatus for making seamless paper gloves, comprising in combination a plurality of spaced ribs arranged to conform to the outline of a hand and tapered upwardly to converge at the tops of the fingers and thumb, a flexible textile fabric glove arranged on said hand, the parallel arrangement of said ribs facilitating the movement of the glove on and off of said hand, and means for passing the fiber stock through said glove whereby the fibers are deposited on the outer surface thereof to form a one-piece seamless paper glove, the fabric glove being collapsible for ready removal from the inside of the paper glove without injury to the latter.

9. Apparatus for making seamless paper gloves, comprising in combination a hollow hand having walls provided with openings for the passage of the fluid paper stock, the fingers being arranged in parallel relation, a collapsible textile fabric glove arranged on said hand for sliding movement thereon and thereoff, and means for passing the fluid paper stock through said fabric glove to form a one-piece paper glove on the outer surface thereof.

10. Apparatus for making molded paper gloves and like articles comprising a container for liquid pulp having an opening in the bottom thereof, a wire frame mounted above said opening, a removable porous collapsible covering of textile fabric on said frame, and means for reducing the pressure below said opening for quickly drawing the liquid pulp through the walls of said frame to leave the fibers on the outer surface of the covering.

11. Apparatus for making seamless paper gloves comprising in combination a frame in the form of a hand and consisting of a plurality of spaced ribs arranged in parallel relation and converging at their outer finger ends, and a flexible textile fabric glove covering on said frame and constituting a fac-simile of the finished glove, the covering being adapted to be removed from the frame with the finished glove and collapsed therein for ready separation therefrom without injury to the paper glove.

12. Apparatus for making seamless paper gloves comprising in combination a frame in the form of a hand, and a flexible textile fabric glove covering on said frame and constituting a fac-simile of the finished glove, the covering being adapted to be removed from the frame with the finished glove and collapsed therein for ready separation therefrom without injury to the paper glove.

PERCY L. BUNN.