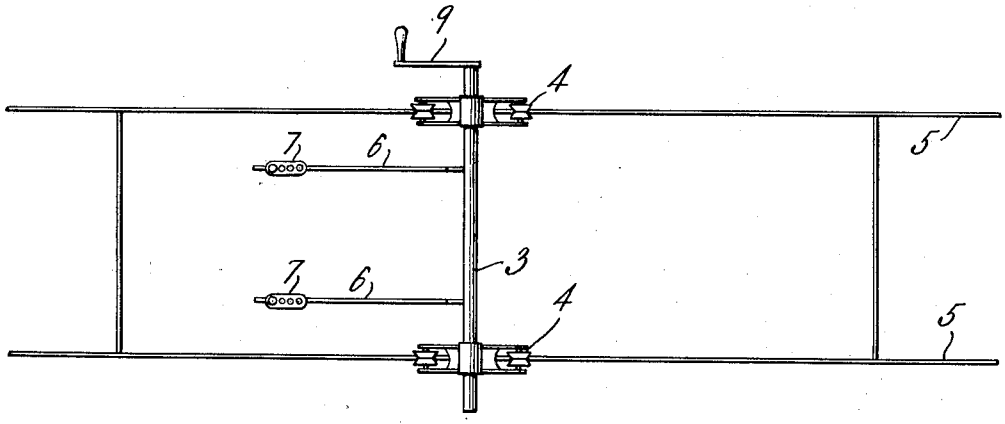
March 27, 1934. H. C. MILLER 1,952,935

DIPPED ARTICLES AND METHOD AND APPARATUS FOR MAKING THE SAME

Filed June 5, 1931

Fig. 1.



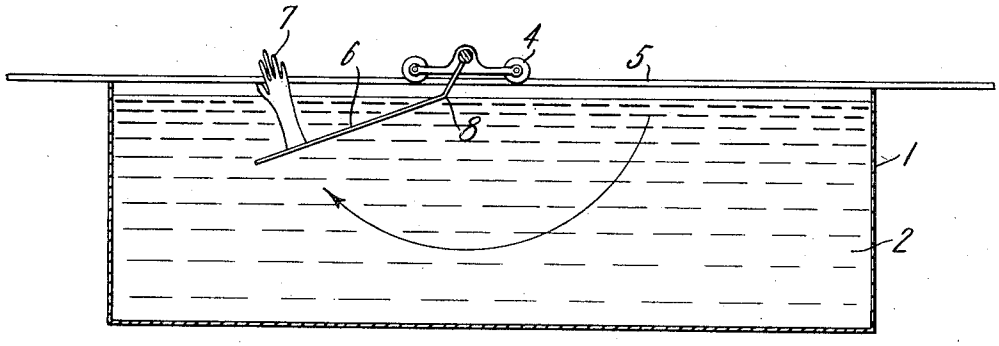


Fig. 2.

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DIPPED ARTICLES AND METHOD AND APPARATUS FOR MAKING THE SAME

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11 Claims. (Cl. 18—58)

This invention relates to dipped articles and methods and apparatus for making the same.

In the ordinary process of dip coating articles or forms by submerging them in a rubber solution such as rubber cement or in a rubber dispersion such as latex, it is customary to suspend such articles or forms from some suitable support and then to lower them into the liquid and out again, in this way securing a coating which may be dried and vulcanized or otherwise treated. In order to prevent the formation of an excessively thickened portion of that part of the article last to emerge from the coating liquid and from which portion excess of the liquid drains off, it has been customary to invert the article or form after draining in order to equalize the distribution of the coating fluid by allowing it to run back evenly on the coated surface. In the case of forms with irregular portions, such as glove forms with finger shaping portions, they are dipped into the coating fluid with the irregular portions or finger shaping portions extending downward and are extracted from the fluid with the irregular portions or the finger shaping portions last to leave the surface of the fluid. In such a case a bridging or webbing of the fluid between the irregular portions, and especially between the finger shaping portions of glove form, almost invariably occurs as the form is withdrawn from the liquid. This bridging or webbing breaks down almost at once but in a large percentage of the operations air is entrapped so that blisters occur in the finished product, as between the fingers of the finished glove. This difficulty occurs when using either rubber cement or rubber latex in the manufacture of gloves by the form dipping method, and in some cases to the extent that as much as 70 to 80% of the gloves will be imperfectly formed.

The present invention relates to methods and apparatus for reducing the bridging and webbing effect and the accompanying blistering produced by present methods of forming dipped articles.

With the preferred embodiment in mind and without intention to limit beyond what may be required by the prior art, the invention may be briefly stated to consist in dipping the article or form into the coating liquid and withdrawing it in such a manner that the irregular portions wherein bridging and webbing are apt to occur, will emerge from the surface of the liquid before other parts of the form. As an illustration a glove form may be dipped so that the fingers and thumb shaping portions emerge from the surface of the liquid before other portions of the form. In this way the bridging and webbing will be reduced to a minimum. The article or form may be dipped in this manner by suspending from a rack or other suitable support and lowering into the coating fluid and out again but in such a case the article should be suspended with the irregular portions extending in an upward direction as it is lowered into the coating liquid instead of in a downward direction, as is the present practice. In this way the finger shaping portions of a glove form, for example, are made to enter the coating fluid last and emerge first. In such a case the bridging or webbing of the fluid between the irregular portions or finger shaping portions will be reduced to a minimum and the resulting blisters on the sides of the irregular portions or fingers of the finished product reduced to a minimum. However, when the irregular portions of an article or form are the last to enter the liquid, there is sometimes a tendency for air bubbles to form at the tips of those irregular portions, as at the tips of the finger shaping portions of a glove form, resulting in small blisters at these tips in the finished article. To remedy this blistering on the tips due to entrapped air, and at the same time to reduce to a minimum the bridging or webbing effect and its consequent blistering on the sides of irregular portions, I have found that the best procedure is to dip the article or form in the coating fluid with the irregular portions penetrating the surface of the fluid before other portions and with the irregular portions emerging from the surface of the fluid before other portions.

The accompanying drawing illustrates a present preferred form of apparatus for dip coating articles or forms in which:

Figure 1 is a plan view of the apparatus for dipping articles or forms in a coating fluid, and

Figure 2 is a vertical longitudinal view of the dipping apparatus.

Referring to the drawing which illustrates more or less diagrammatically an apparatus for dipping articles such as glove forms into a coating fluid in the manner described above, the numeral 1 indicates a tank or chamber which may contain a coating fluid 2 such as rubber cement or a rubber dispersion, as natural or artificial latex. A rotating shaft or axle 3, which may be operated by any desired means as by a hand lever 9, rests on carriers 4 which in turn are supported by and movable on tracks 5 situated above the tank 1. A series of tanks 1 may be lined up along the tracks 5 and the carriers 4 may run

along the tracks and thus transfer the shaft 3 from one tank to another as desired. Connected to the shaft 3 at various points as may be desired, are radial arms 6 to which are attached at an angle thereto one or more forms 7 to be dipped into the coating fluid 2. The forms 7 may be of various constructions as for example solid or hollow, metal or non-metal, porous or non-porous or perforated, with or without suction applied to the interior of the form depending on the type of coating fluid and type of dipping used. For example, the form 7 may be a non-porous solid form and may dip into a latex composition in the tank 1 and the latex adhering to the form may, if desired, be subsequently coagulated by treatment with acid or other coagulant in a manner well known in the art. The forms 7 may be attached to the radial arms 6 in any desired manner as by fastening them to the arms or by clips or locks on the arms, and they may be set at any desired angle to the arm. The forms are shown at right angles to the arm so that the form will enter and emerge from the surface of the fluid at approximately right angles to the surface. The angle at which the form enters and emerges from the surface of the fluid may also be varied somewhat by making a bend in the arm 6 as at 8. Besides increasing the angle between the form and the surface of the fluid at the time the form enters and emerges therefrom, the bending of the arm 6, as at 8, also makes it possible to put more forms on a single arm than would be possible if the arms were straight. The articles or forms need only be attached to the arm at a sufficient distance from the axis of the shaft so that it is possible by rotating the shaft and accompanying arm to completely submerge them.

In operation, the shaft 3 moved on the tracks 5 to a position above the tank 1 by means of carriers 4, is preferably made to rotate by hand lever 9 or by machine completely in a clockwise direction as shown by the arrow in Figure 2. The articles or forms 7, attached to the arms 6, will thus be made to dip into and emerge from the rubber latex or whatever fluid may be in the tank at an angle to the surface of the fluid, so that the irregular portions of the articles or forms will enter and leave the surface of the fluid before other portions of the articles or forms. The shaft 3 may, however, be made to rotate in a counter clockwise direction sufficiently to submerge the articles or forms 7 in the fluid in the tank and then rotated in a clockwise direction, as shown by the arrow in Figure 2, to permit the articles or forms to emerge from the surface of the fluid with the irregular portions before other portions. In this later case, the irregular portions of the article or form emerge from the surface of the coating fluid before other portions of the article or form but enter the coating fluid after other portions of the article or form. This later method may be of advantage if the full length of the tank is not sufficient to allow a full revolution of the radial arms.

In the case of the glove forms shown in the figures the form after dipping in the coating fluid may be given other treatments as for example a coagulating treatment as above described, a washing treatment, or a series of coating treatments along with other treatments as for example a series of coating, coagulating and washing treatments if desired. The coating fluid may be compounded as desired and if a rubber coating or article is to be produced, vulcanizing or accelerating ingredients may be added to the coating fluid. The form may be heated and the coating on it dried, and vulcanized if desired, and after such treatment stripped from the form. The form may be heated internally during dipping, drying and vulcanizing operations. Vulcanization may be carried out by heating the rubber covered article or forms in hot water containing water-soluble accelerators prior to drying, if desired. The article dipped need not necessarily be a form from which a completed article is subsequently to be stripped. The article dipped may in part or in whole itself form a part of a finished coated article. While rubber cement and rubber latex have been mentioned as coating fluids, the invention is in no way limited to the use of such but may be used with artificial dispersions of rubber or other materials and in fact is applicable to coating operations in general wherever there is a tendency of the fluid into which an article is dipped to bridge or web across irregular portions of such an article or form.

As the invention may be practiced in many different ways without departing from the spirit thereof, it will be understood that I do not intend to limit myself to the specific embodiment shown herein except as indicated in the appended claims.

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

1. A method of dip coating a glove form to reduce the bridging and webbing of the coating fluid between the finger shaping portions thereof, comprising the steps of dipping the form into a coating fluid with the finger shaping portions first penetrating the surface of the fluid at approximately right angles thereto, and removing the form from said fluid with the finger shaping portions first emerging from the surface of the fluid at approximately right angles thereto.

2. A method of dip coating a glove form to reduce the bridging and webbing of the coating fluid between the finger shaping portions thereof, comprising the steps of dipping the form into a coating fluid with the finger shaping portions penetrating the surface of the fluid before other portions of said form and removing the form from said fluid with the finger shaping portions emerging from the surface of the fluid before other portions of said form.

3. A method of dip coating a glove form to reduce the bridging and webbing of the coating fluid between the finger shaping portions thereof, comprising the steps of dipping the form into a coating fluid, and removing the form from said fluid with the finger shaping portions first emerging from the surface of the fluid at approximately right angles thereto.

4. A method of dip coating a glove form to reduce the bridging and webbing of the coating fluid between the finger shaping portions thereof, comprising the steps of dipping the form into a coating fluid and removing the form from said fluid with the finger shaping portions emerging from the surface of the fluid before other portions of said form.

5. A method of dip coating a glove form to reduce the bridging and webbing of the coating fluid between the finger shaping portions, comprising passing the form through and out of a coating fluid with the finger shaping portions preceding the other portions of the form.

6. A method of dip coating an article with irregular portions to reduce the bridging and webbing of the coating fluid between the irregular portions, comprising the steps of dipping the

article into a coating fluid with the irregular portions penetrating the surface of the fluid before other portions of said article, and removing the article from said fluid with the irregular portions emerging from the surface of the fluid before other portions of said article.

7. A method of dip coating an article with irregular portions to reduce the bridging and webbing of the coating fluid between irregular portions, comprising the steps of dipping the article into a fluid with the irregular portions first penetrating the surface of the fluid, and removing the article from said fluid with the irregular portions first emerging from the surface of the fluid.

8. A method of dip coating an article with irregular portions to reduce the bridging and webbing of the coating fluid between the irregular portions comprising the steps of dipping the article into a coating fluid, and removing the article from said fluid with the irregular portions emerging from the surface of the fluid before other portions of said article.

9. A method of dip coating an article with irregular portions to reduce the bridging and webbing of the coating fluid between the irregular portions comprising the steps of dipping the article into a coating fluid, and removing the article from said fluid with the irregular portions first emerging from the surface of the fluid.

10. A method of dip coating an article with irregular portions to reduce the bridging and webbing of the coating fluid between the irregular portions, comprising passing the article through a coating fluid with the irregular portions in advance of other portions of the form.

11. A method of dip coating an article with irregular portions to reduce the bridging and webbing of the coating fluid between the irregular portions, comprising passing the article through and out of a coating fluid with the irregular portions in advance of other portions of the form.

HERMAN C. MILLER.