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METHOD AND MEANS FOR APPLYING LIQUID TO FORM A COATING ON GLASS AND FOR RECOVERING EXCESS LIQUID

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Fig. 3.

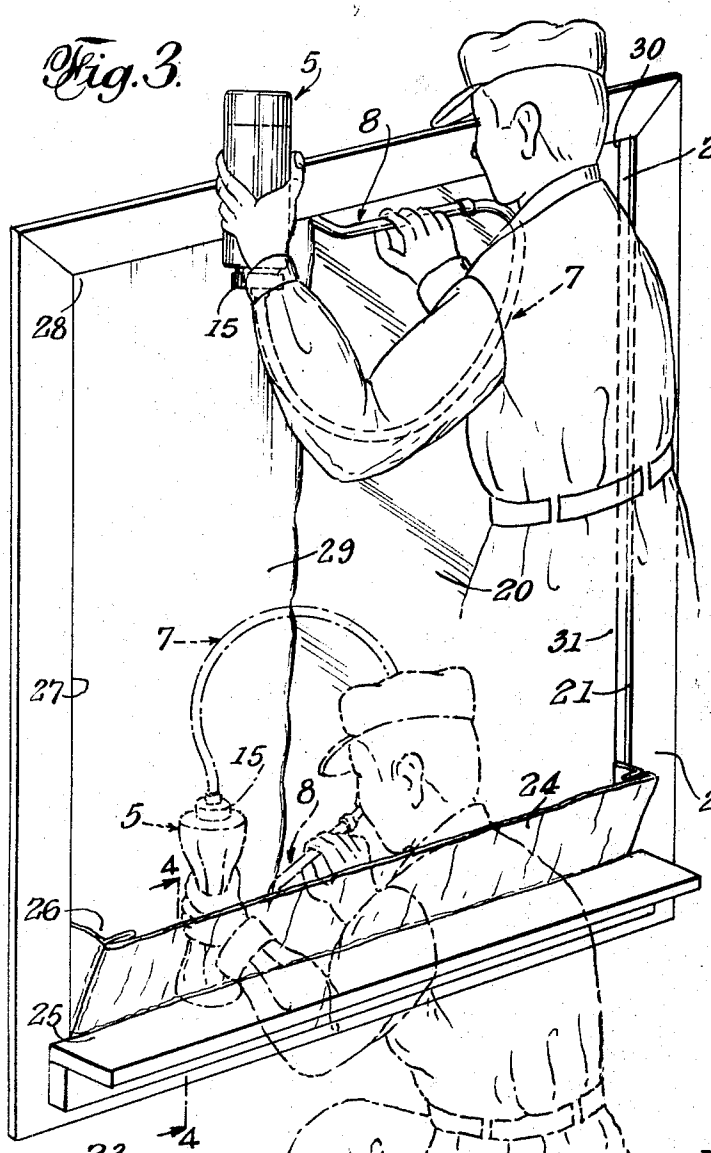


Fig. 1.

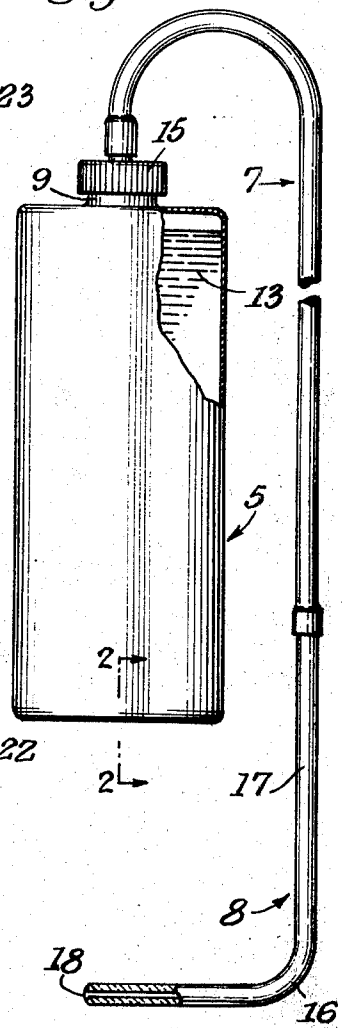


Fig. 2.

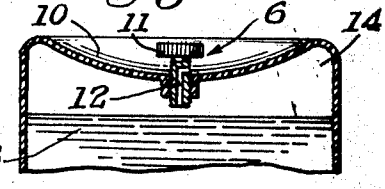
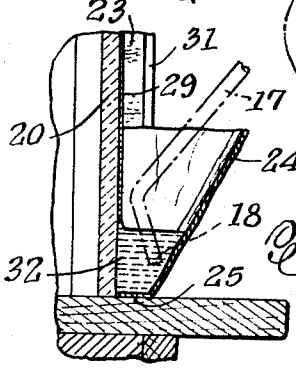


Fig. 4.



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METHOD AND MEANS FOR APPLYING LIQUID TO FORM A COATING ON GLASS AND FOR RECOVERING EXCESS LIQUID

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This invention relates to a method and means for applying liquid on glass windows, panels, or the like, to form a permanent coating thereon and for recovering excess liquid for re-use thereof to cover other glass windows or panels.

Spraying of such liquid coatings has been found unsatisfactory, since a streaky and uneven coating results. Uniform coatings have been obtained only by providing a gravity flow of the liquid from the topmost edge of a window, the flow being in excess of the amount of liquid needed to coat and to insure that the liquid clinging to the glass surface will comprise a uniformly thick layer which forms a permanent bond with the glass.

A coating method now in common use can be carried out for coating and recovering excess material only by professionals using apparatus that is power-operated, is quite costly and, for efficient operation, requires the services of two men. Needless to say, such a method is expensive due to the use of professional labor and the need for expensive equipment.

Some objects of the present invention are to provide a method for the indicated purpose, that is materially less expensive to carry out than known methods, requires but ordinary skill, and yet enables the attainment of professional results, and uses means that is both inexpensive to acquire and easy to use and, after use, may be discarded, since little can be saved by re-filling the same over the purchase price of replacement means.

Another object of the invention is to provide a method, as above characterized, that may be carried out by manual manipulation of simple, inexpensive means, to both apply the coating liquid and to recover the excess thereof.

A further object of the invention is to provide a window coating method that may be carried out entirely by inexpensive, manually operated apparatus on a do-it-yourself basis.

The invention also has for its object to provide a novel, economical and convenient method or process of superior utility.

The invention also comprises novel combinations of method steps, which will appear more fully in the course of the following description of the present method or process, the same being based on the accompanying drawing. However, the following specification merely discloses one embodiment of the present invention, and the same is given by way of example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a broken elevational view, partly in section, of liquid-applying and liquid-recovering means according to the present invention.

FIG. 2 is an enlarged cross-sectional view as taken on the line 2—2 of FIG. 1.

FIG. 3 is a perspective view showing the manner of using the means of FIG. 1 according to the present method.

FIG. 4 is an enlarged and fragmentary cross-sectional view as taken on the line 4—4 of FIG. 3.

The present liquid-applying and recovering means comprises, generally, a container 5 for the liquid, an air valve 6 provided at one end of the container, a flexible tube or hose 7 removably attached to the opposite end of the container, and a liquid-applying tip or nozzle 8 on the end of said hose.

The container 5 is preferably formed of flexible plastic and is of the type known variously as a squeegee bottle or a plastic bottle. In this case, the container 5 is cylindrical in form and of a diametral size to be conveniently grasped in the hand, to be held in operative position when in use, to apply its contents to a window, and to be squeezed, when empty or partly empty, to collapse the same to so reduce the quantity of air therein as to create a suction to cause inward flow as the squeezed bottle is gradually allowed to expand to its normal condition. Said bottle has an open end 9 to which the hose 7 is attachable, and an opposite and preferably concavely dished end wall 10 mounting the valve 6.

In this case, said valve 6 is shown as a screw member 11 threadably engaged with the wall 10 and provided with an air passage 12. Said passage is closed to air flow when the member 11 is tightened, and is open to allow flow into the bottle when the same is backed off, as in FIG. 2. Thus, with the bottle wall up and the valve 6 open, gravity discharge of liquid 13 from the end 9 of the bottle may occur, since the space 14 above said liquid is replenished with air entering through the open valve 6. The valve 6 it preferably formed so as to be housed in the concavity in wall 10, enabling the bottle to be supported in upright condition when not in use.

The hose 7 is shown as a common flexible conduit that, by means of a cap 15, may be attached to the end 9 of the container.

The tip or nozzle 8 is preferably rigid and may be advantageously made of glass, the same being formed with a bend 16 so that a handle part 17, that attaches to the hose, and an applying end 18, are formed, as shown in the several views.

When provided as part of a do-it-yourself kit, the container 5 is provided with a closure cap which is removed to allow attachment of the cap 15.

As shown in FIG. 3 and FIG. 4, a window or other glass panel 20 is prepared for receiving a coating of the liquid 13 by being thoroughly cleaned so the surface is free of dust, paint, specks or other foreign matter. The inside surfaces 21 of the window frame 22 are covered with narrow masking tape 23, so the liquid will not stain the surfaces of the frame 22 adjacent to the window edges. The tape 23 may be applied to the upper and side surfaces 21.

A liquid-collecting trough 24 is applied to the frame 22 along the bottom edge of the window 20 in such a manner that liquid flowing down on the face of the glass will be collected thereby and kept out of contact with any portion of the window frame. Said trough may be advantageously made of wide masking tape (four to five inches) and applied and adhered to the bottom surface 25 of the frame 22 and the adjacent portions of the inside surfaces 21. Friction-sensitive tape may be used to hold in place whatever folds may be required to hold the tape in the form of the trough 24.

After the window is cleaned and the same is prepared by application of the masking tape 23 and of the trough 24, the liquid may be applied by holding the container upside down with its valve backed off to allow free entry of atmosphere air into the container.

The application of liquid to the window is preferably started at one lower corner 26 of the window by placing the applying end 18 of the nozzle 8 against said corner with the container elevated so the liquid level therein is above the nozzle end 18. The nozzle is kept in close adjacency to the inside of the frame at 27 and moved upwardly from said lower corner 26 toward the upper corner 28. The liquid 13 will thus form a coating on the glass along the inside 27 of the window frame. All the while this is done, the container 5 is moved upwardly as

the nozzle is so moved, to insure continuous gravity flow of liquid.

When the nozzle tip **18** reaches the inside of the upper part of the frame at point **28**, the same is moved slowly toward the other upper corner of the frame **22**, the liquid flowing as a gradually widening film **29** that drains down into the trough **24** and collects therein. The coating stip is continued in a steady and continuous manner toward the opposite upper corner of the glass panel to cause the entire surface of the panel to be uniformly coated. To insure full coating at side **31** below corner **30**, the liquid flow is continued along said side **31** to the bottom of the window.

In a few minutes, the film **29** will be fully formed and excess applied liquid drained into the trough. The retrieving or recovering step of the method may be now carried out to remove the excess liquid collected in the trough **24**.

While holding the inverted container **5** at a level substantially below the nozzle **17**, the air valve **6** is closed by tightening the screw **11** to cause the air passage to be closed. Now, the container is up-ended and squeezed, as shown in the lower portion of FIG. 3, to force as large amount of air from the container as can be so expelled. The end **18** of the nozzle **8** is now dipped into the liquid **32** in the trough, as shown in FIG. 4. As the squeezing grip is gradually released, the bottle will slowly return to its initial cylindrical condition, creating suction that draws said liquid **32** into the bottle. The bottle should, at least partly, be below the level of the trough during retrieving of the liquid **32**.

Ordinarily, one squeeze and release of the bottle will suffice to drain the trough. If a second such action is needed for complete drainage, squeezing the bottle above the liquid level therein will effect such additonal liquid retrieving.

After a few minutes to allow drying of the small residue in the trough, the same and the other masking tape may be carefully removed to obviate splatter.

The glass panel will now have a tinted coating thereon that, when cured and, if desired, treated with a preservative, will have permanence over a period of many years.

The recovered liquid may now be used to coat another glass panel in the manner above described. Thus, the original amount of liquid in the container **5** may be used to coat several panels, since after retrieving the excess drainage, as above, after each application, the level of liquid in the container is diminished only by the amount of liquid that forms the coating.

Of course, any reduction in the contents of the container may be replenished, as desired.

While I have disclosed what I now contemplate to be the best mode of carrying out my invention, the same is, of course, subject to modification without departing from the spirit and scope of the invention. Therefore, I do not wish to restrict myself to the particular method steps or combination or sequence of method steps described, but desire to avail myself of all equivalent steps or methods that may fall within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A window-coating method that consists in

(a) masking around the sides, top and lower edges of the window,

(b) forming a temporary trough along the lower window edge,

(c) applying liquid coating material to the surface of window by a gravitational flow from a nozzle on the end of a hand-carried container of such material that is vented at the opposite end and is held inverted with the vented end of the container up, the application being begun at the upper edge of the window,

(d) collecting the excess of said flow in said trough as the same drains down along the surface of the window, and

(e) after coating the entire surface of the window, closing the vent in the container and, after re-inverting the same so the nozzle end is up, alternately squeezing and releasing the container to suck the collected excess from the trough directly from the trough back into the container from which the liquid had been gravitationally removed.

2. A device for coating a window and for removing excess coating liquid after the same has gravitationally flowed along the window surface, said device comprising

(a) a plastic container having collapsible side walls,

(b) a settable air valve provided at one end of the container and settable to venting and non-venting positions and, thereby, to open and close flow of atmospheric air into the container, and

(c) a flexible hose connected to the opposite end of the container and having an end to gravitationally apply liquid onto a window surface when said container is vented, and to retrieve excess coating liquid by drawing the same into the container when the same is non-vented and the walls of the container are first collapsed by squeezing thereof and then released to resume their initial expanded condition.

3. A device according to claim **2** in which said hose is provided with a non-flexible nozzle in which the mentioned applying and retrieving end is provided.

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U.S. Cl. X.R.

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