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PRESSURE FED LIQUID APPLICATOR

Filed June 22, 1961

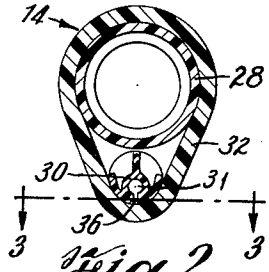


Fig. 2.

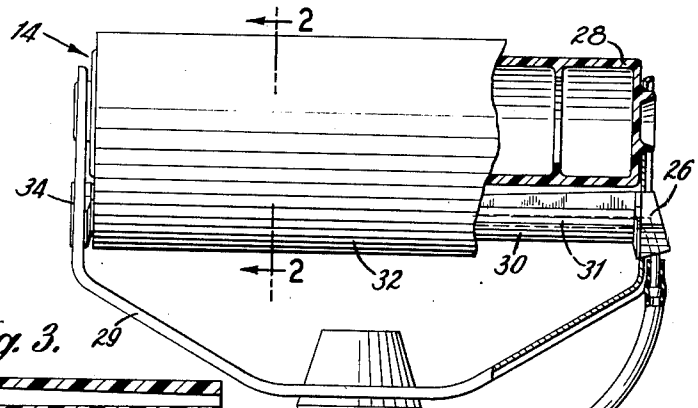


Fig. 3.

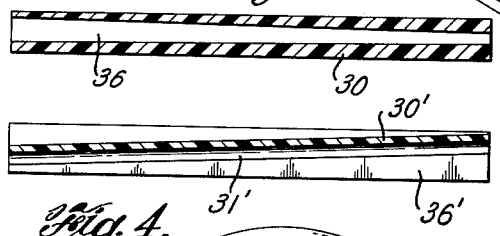


Fig. 4.

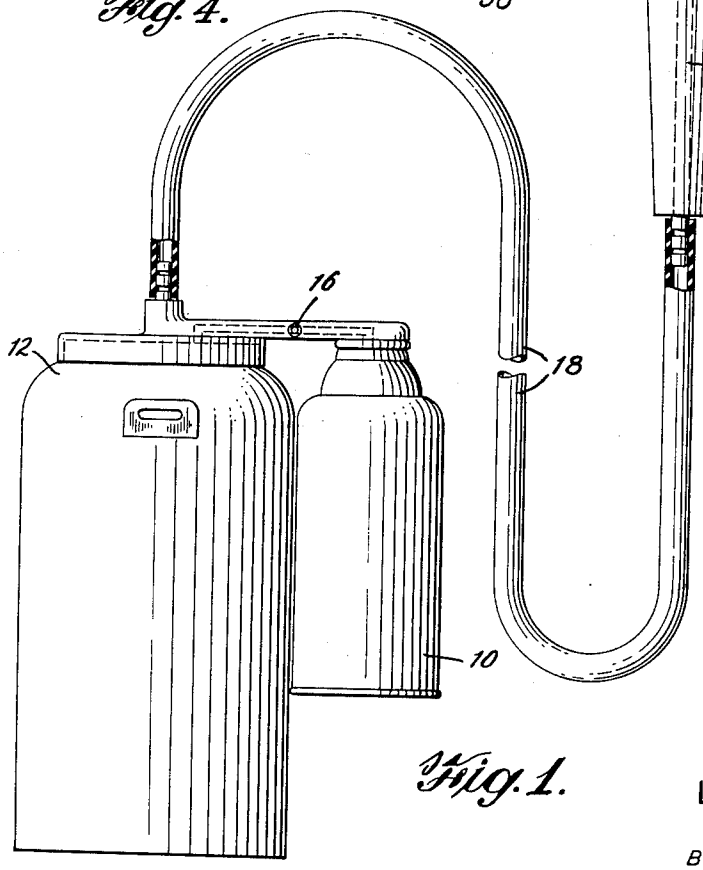


Fig. 1.

INVENTOR.
LEE S. CHADWICK II

BY Robert C. Cummings

ATTORNEY

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PRESSURE FED LIQUID APPLICATOR

Lee S. Chadwick II, St. Albans, Vt., assignor to Union Carbide Corporation, a corporation of New York

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This invention relates to an applicator for liquids and refers more particularly to an applicator of the type wherein a liquid is supplied to a liquid applying surface from an external liquid reservoir by pressure means. For reasons of convenience, the discussion of the invention will be particularly directed to paint applicators.

The use of a roller instead of a brush to apply paint to a surface has become a widespread practice. The well known roller and pan method of applying paint wherein the roller is dipped in a pan or tray of paint is commonly practiced, but it is inconvenient with respect to the time consumed in pan rolling to obtain the desired distribution of paint on the roller and the relative undesirability of operating from an open, spillable, pan of paint.

The prior art is replete with methods for applying paint to the surface of a roller. For example, hollow rollers are designed to be filled internally by hand and then sealed for use. The paint is deposited on the surface of the roller by absorption through the material covering the roller surface. Unfortunately, these rollers are excessively heavy due to the internal paint reservoir which must be carried, and also, they must be frequently refilled.

Other rollers call for a distribution tube extending across the surface of the roller which permits the paint to be deposited directly on the external surface of the roller. A roller disclosed in U.S. Patent 2,955,310 is provided with a manifold with spaced openings in pressure contact with the roller which permits paint to be applied directly to the surface of the roller, with a minimum of splattering. A particular problem encountered with this type of roller is the tendency for the paint to be applied in streaks rather than uniformly on the surface to be painted. Moreover, for one reason or another, all of the roller systems of the prior art have been found to possess some inherent disadvantages.

The principal object of the invention is to provide a pressure fed liquid applicator with improved means for depositing and distributing the liquid on the surface of the applicator.

Another object of this invention is to provide a painting system wherein the paint is completely confined until it is delivered to an applicator.

Still another object of the invention is to provide a completely portable leak-proof and spill-proof painting system.

The above objects are accomplished by the applicator of the invention which comprises a paint pervious belt which rotates about a paint impervious core and a paint feeder tube. The paint feeder tube is provided with aperture means which allow the paint to be deposited on the inner surface of said paint pervious belt and thereby ultimately on the outer surface of said belt. A completely portable painting system is provided by connecting the above described applicator to a portable sealed paint container which is in communication with a portable pressure source.

The particular liquid pervious material to be employed as the belt depends, of course, in each instance, on the particular liquid or paint to be applied. Among suitable materials are porous flexible plastic foams, porous natural and synthetic rubber, porous paper, etc. An open-pore polyurethane belt approximately one-quarter inch thick has been found to serve as an excellent paint pervious belt.

The invention will be more readily understood by reference to the accompanying drawing, wherein:

FIG. 1 is a front elevational view, partially in section, which illustrates an applicator embodying the invention in conjunction with a reservoir of paint and pressure means for delivering said paint to said applicator;

FIG. 2 is a view taken along the line 2—2 of FIG. 1;

FIG. 3 is a horizontal sectional view along the line 3—3 of FIG. 2, showing a feeder tube having a slot of increasing width; and

FIG. 4 is a vertical sectional view of a feeder tube having a passageway diagonal to the axis of the feeder tube and showing a slot of varying depth.

Referring now to the drawing, a completely portable painting system is shown which comprises a pressure source **10**, in communication with a closed paint container **12**, and an applicator **14** as its basic components. Any pressure source **10** may be employed, a convenient source being a closed container which contains a liquefied gas. A shut-off valve **16** is provided between the pressure source **10** and the paint container **12** or if desired a conventional pressure regulator (not shown) may be used. A flexible hose **18** connects the paint container **12** to a handle **20** provided with a conduit **21**, and to which the paint applicator **14** is attached. A control valve **22** is provided in the handle member **20**. A conduit member **24** connects the handle **20** to a hollow end fitting **26** provided on the applicator **14**. A paint impervious core **28** is mounted in the yoke **29** of the paint applicator **14**. Preferably, this core **28** is mounted so that it is free to rotate within the yoke **29**. Fixedly mounted in the yoke **29** of the applicator **14** and in communication with the hollow end fitting **26**, is a feeder tube **30**. The passageway **31** in the feeder tube **30** is in communication with the surface of the feeder tube **30** by means of a longitudinal slot **36** which permits the paint from the feeder tube **30** to be deposited on the inside of a paint pervious belt **32** which is mounted on the paint impervious core **28** and the feeder tube **30**. The paint pervious belt **32** will rotate about the paint impervious core **28** and the feeder tube **30** as the applicator **14** is moved over the surface to be painted. A bracket **34** seals the far end of the paint passage of the feeder tube **30**.

In order to insure a more uniform deposit of paint across the entire inner surface of belt **32**, the width of the slot **36** which connects the passageway **31** with the surface of the feeder tube **30** should be narrowest at the end which first receives the paint under the highest pressure, i.e., at end fitting **26**, and it should become wider the further across the feeder tube **30** it extends to compensate for the pressure drop which is encountered as shown in FIG. 3. Alternatively, the width of the slot **36'** may be kept constant and instead the passageway **31'** may be provided diagonally to the axis of the feeder tube **30'** as shown in FIG. 4. The depth of the slot **36'** should be greatest at the end which first receives the paint and least at the far end of the feeder tube **30'**. The greatest slot depth, results in higher fluid friction, and thus compensates for the higher pressure at the feed end of the passageway **31'**.

Operation of the illustrated system is as follows: When the valve **16** is opened, the paint in the container **12** is pressurized due to the pressure source **10**, and the paint will flow through the flexible hose **18** into the conduit **21** provided in the applicator handle **20**. When the valve **22** is opened, the paint will flow through the conduit member **24** into the end fitting **26** and subsequently into the passageway **31** of the feeder tube **30** from whence it passes to the paint pervious belt **32** by means of the longitudinal slot **36**. As the belt **32** is caused to rotate about the paint impervious core **28** and the feeder tube **30**, the paint is constantly deposited on the inner surface of the

belt **32** and it permeates the belt **32** through to the external surface as the line of deposit on the belt approaches the impervious core **28**, and the paint will be transferred to the desired surface as the applicator is rolled over it.

The paint pervious belt performs a two-fold purpose. First it aids in the even distribution of paint across the paint applicator, and secondly, it serves as a paint reservoir, thereby preventing drippage.

It will of course be appreciated that the applicator device of the invention is also well suited to the application of other liquid coatings such as, for example, floor wax, white wash and varnish.

I claim:

1. In combination with a pressurized liquid reservoir; a liquid applicator comprising a handle; a yoke secured to said handle; a liquid impervious core rotatably mounted in said yoke; a liquid feeder tube fixedly mounted in said yoke and in close spaced parallel relationship to said liquid impervious core, said liquid feeder tube having a longitudinal passageway open at one end and closed at the other end and having a longitudinal slot located on the side of said feeder tube remote from said liquid impervious core for connecting said passageway with the surface of said feeder tube, said longitudinal slot being characterized in having a resistance to liquid flow which is uniform from one end to the other; a liquid pervious belt encircling said core and said liquid feeder tube and adapted to rotate thereabout, the inner surface of said belt being in contact with the edges of said longitudinal slot; and conduit means connecting the open end of said passageway with said pressurized liquid reservoir.

2. The combination of claim 1 wherein said longitudinal slot is of constant depth and increases in width as it extends across said liquid feeder tube away from said open end.

3. The combination of claim 1 wherein said longitudinal slot is of constant width and decreasing depth as it extends across said liquid feeder tube away from said open end.

4. In combination with a pressurized liquid reservoir; a liquid applicator comprising a hollow handle member; a conduit positioned in the hollow portion thereof; a yoke secured to said handle; a liquid impervious core rotatably mounted in said yoke; a liquid feeder tube of substantially smaller diameter than said liquid impervious core, fixedly mounted in said yoke in close spaced parallel relationship to said liquid impervious core, said liquid feeder tube having a longitudinal passageway open at one end and closed at the other end and having a longitudinal slot located on the side of said liquid feeder tube remote from said liquid impervious core for connecting said passageway with the surface of said feeder tube, said longitudinal slot being characterized in having a resistance to liquid flow which is uniform from one end to the other; a liquid pervious belt encircling said core and said liquid feeder tube and adapted to rotate thereabout, the inner surface of said belt being in contact with the edges of said longitudinal slot; a conduit member connecting the open end of said liquid feeder tube with the one end of the conduit located in said hollow handle; a flexible hose in communication between the other end of said conduit and said pressurized liquid reservoir; and a manually activated valve to regulate the flow of liquid into said passageway.

5. The liquid applying means of claim 4 wherein said slot is of constant depth, the width of said slot increasing as it extends across said feeder towards the sealed end.

6. The liquid applying means of claim 4 wherein said slot is of constant width and of decreasing depth as it extends across said feeder tube towards the sealed end.

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