Aug. 25, 1964 D. M. FISCHER ETAL 3,145,411

PRESSURE FED LIQUID APPLICATOR

Filed June 22, 1961

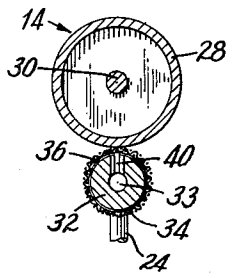
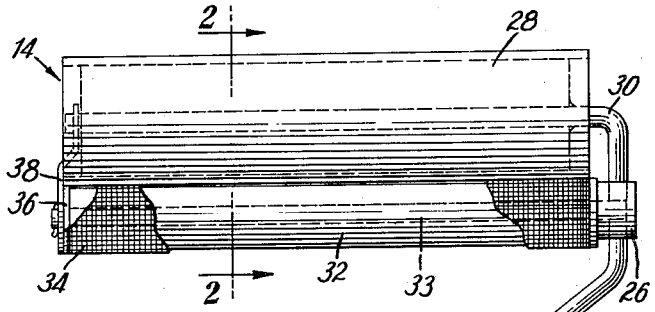



Fig. 2.



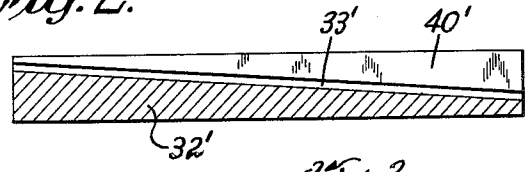




Fig. 3.

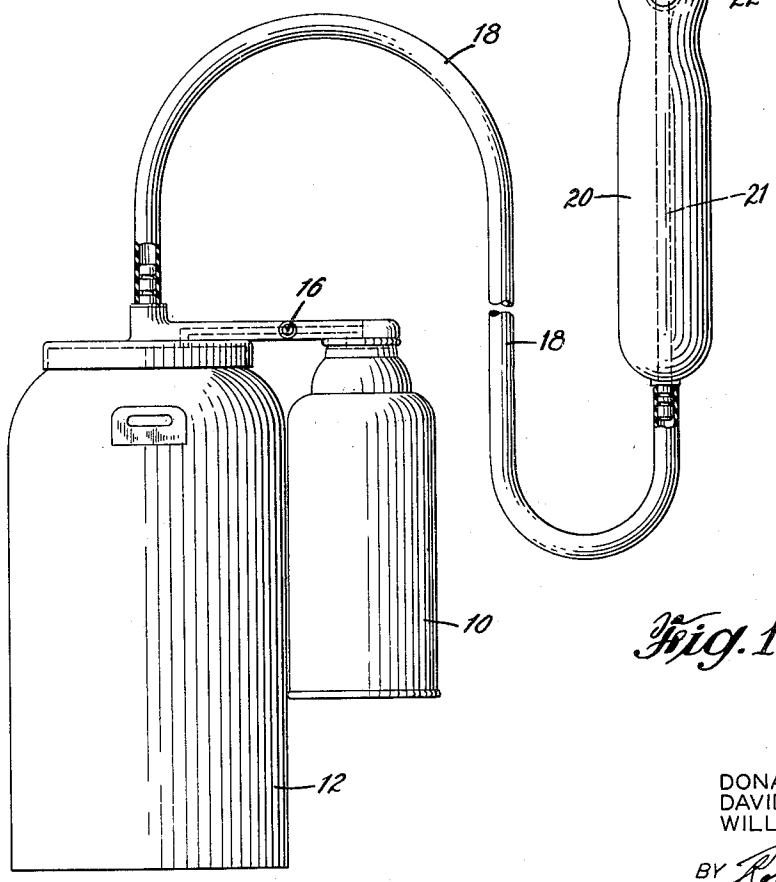



Fig. 1.

INVENTORS
DONALD M. FISCHER
DAVID L. KAYSER
WILLIAM L. KENNEDY

BY Robert C. Cummings
ATTORNEY

United States Patent Office 3,145,411 Patented Aug. 25, 1964



3,145,411

# PRESSURE FED LIQUID APPLICATOR

Donald M. Fischer, Buffalo, and David L. Kayser, Kenmore, N.Y., and William L. Kennedy, Noroton, Conn., assignors to Union Carbide Corporation, a corporation of New York

Filed June 22, 1961, Ser. No. 118,968
6 Claims. (Cl. 15—552)

This invention relates to an applicator for liquids and refers more particularly to an applicator of the type wherein a liquid is supplied to the surface of a roller 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 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. Among the problems which are encountered with this type roller are excessive filtration of the paint as it passes through the roller material, and the formation of undesirable paint bubbles on the surface of the roller. In addition, the roller is excessively heavy due to the internal paint reservoir which must be carried.

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 this invention is to provide a pressure fed liquid applicator with improved means for initially depositing and distributing the liquid on the surface of a roller.

Another object of this invention is to provide a painting system wherein the paint is completely confined until it is deposited on the surface of 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 rotatably mounted roller, a feeder member which may be in the form of a cylindrical tube adapted to be supplied with paint and which is provided with a rotatable sleeve of screen material mounted in longitudinal contact with said roller, and aperture means in said feeder member to allow paint to be deposited on the surface of said feeder member, and onto said sleeve and ultimately onto said roller when said sleeve rotates with said roller. 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 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 showing a feeder tube having a slot of increasing width; and

FIG. 3 is a sectional view of another embodiment of the invention showing a feeder tube in which a passageway is provided diagonal to the axis of the feeder tube and in which the slot decreases in depth as it extends across the feeder tube.

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 a applicator **14** as its basic components. Any pressure source **10** may be employed, a convenient source being a sealed 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 and support member **24** connects the handle **20** to a hollow end fitting **26** provided on the applicator **14**. A roller **28** is rotatably mounted on a shaft **30** attached to the end fitting **26**. Also mounted on the end fitting **26**, is a feeder tube **32** which is in communication with the conduit member **24**. A cylindrical sleeve **34** made of screen material is fitted over the feeder tube **32**, and the sleeve **34** is in longitudinal contact with the paint roller **28**. The passageway **33** in the feeder tube **32** is in communication with the surface of the feeder tube **32** by means of a longitudinal slot **40** which permits the paint which is fed to the feeder tube **32** to be deposited on the sleeve **34**. The sleeve **34** will rotate about the feeder tube **32** when the roller **28** is rotated due to its contact therewith. Preferably, small rings **36** are provided as sleeve-to-feeder tube bearings to minimize friction and permit the free rotation of the sleeve **34**. A bracket **38** seals the far end of the paint passages of the feeder tube **32** and aids in maintaining roller-to-screen contact.

In order to insure a more uniform deposit of paint on the sleeve **34**, the width of the slot **40** which connects the passageway **33** with the surface of the feeder tube **32** 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 **32** it extends to compensate for the pressure drop which is encountered as shown in FIG. 2. Alternatively, the width of the slot **40'** may be kept constant and instead the passageway **33'** may be provided diagonally to the axis of the feeder tube or member **32'** as shown in FIG. 3. The depth of slot **40'** should be greatest at the end which first receives the paint and least at the far end of the feeder tube **32**. The greater slot depth, results in higher fluid friction, and thus compensates for the higher pressure at the feed end of the passageway **33**.

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 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 **33** of the feeder tube **32** from whence it passes to the screen sleeve **34** by means of the longitudinal slot **40**. The sleeve **34**, being in contact with the roller **28**, further aids to

effect uniform flow of paint onto the surface of the roller **28**, for as explained above, when the roller **28** is rotated, the sleeve **34** will likewise rotate, and thereby a continuous supply of paint is provided across the surface of the roller **28**.

The sleeve **34** performs a two-fold purpose. First, it aids in the even distribution of paint across the roller **28**, and secondly, it confines excess paint between it and the slotted feeder tube **32**, thereby preventing drippage. The latter is achieved by a proper selection of screen material in making the sleeve **34**.

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.

We claim:

1. In combination with a pressurized liquid reservoir; a liquid applicator comprising a handle, a support member secured to said handle; a roller rotatably mounted on said support member; a cylindrical liquid feeder member fixedly mounted on said support member and extending parallel to said roller; said feeder member having a longitudinal passageway open at one end and closed at the other end and having a longitudinal slot connecting the passageway with the surface of said feeder member, the slot being located on the side of said feeder member facing said roller, the longitudinal slot being characterized by having a resistance to liquid flow which is uniform from one end to the other; a cylindrical sleeve of screen material rotatably mounted on and encircling said feeder member in engagement with the surface of said cylindrical member, said sleeve being in contact with said roller; 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 increasing width as it extends across said liquid feeder member 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 member away from said open end.

4. In combination with a pressurized liquid reservoir; a liquid applicator comprising a conduit-handle member; a conduit-support-member secured to and in communication with said conduit-handle; a roller rotatably mounted on said conduit-support member; a cylindrical liquid feeder member of substantially smaller diameter than said roller fixedly mounted on said conduit-support member in close spaced parallel relationship to said roller, said liquid feeder member having a longitudinal passageway open at one end and closed at the other end and having a longitudinal slot located on the side facing said roller for connecting said passageway with the surface of said liquid feeder member, said longitudinal slot being characterized in having a uniform resistance to liquid flow from one end to the other, said passageway being in communication with said conduit-support member; a cylindrical sleeve of screen material rotatably mounted on and encircling said liquid feeder member in engagement with the surface of said cylindrical member, said sleeve being in contact with said roller; a flexible hose in communication between said conduit-handle member and said pressurized liquid reservoir; and a manually activated valve to regulate the flow of liquid from said pressurized liquid reservoir.

5. The combination of claim 4 wherein said longitudinal slot is of constant depth and increasing width as it extends across said liquid feeder member away from said open end.

6. The combination of claim 4 wherein said longitudinal slot is of constant width and decreasing depth as it extends across said liquid feeder member away from said open end.


**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,281,773 | Kollmann | May 5, 1942 |
| 2,860,359 | James | Nov. 18, 1958 |
| 3,030,652 | Whitfield | Apr. 24, 1962 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 562,761 | Canada | Sept. 2, 1958 |
| 903,913 | Germany | Feb. 11, 1954 |
| 905,236 | Germany | Mar. 1, 1954 |
| 1,236,218 | France | June 7, 1960 |