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2,932,045

FLUID-SUPPLIED ROLLER APPLICATOR

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FIG. 1.

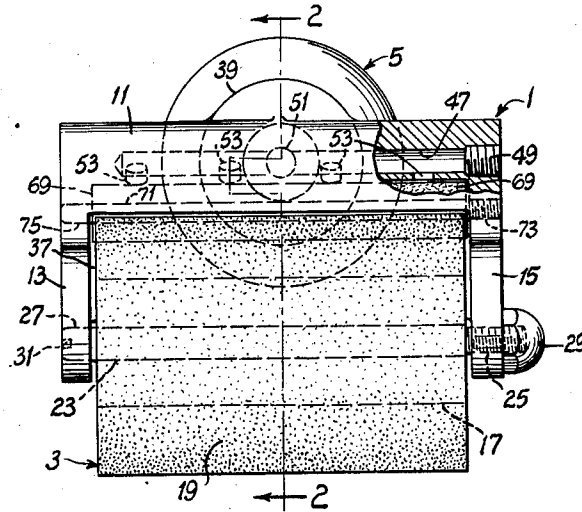


FIG. 2.

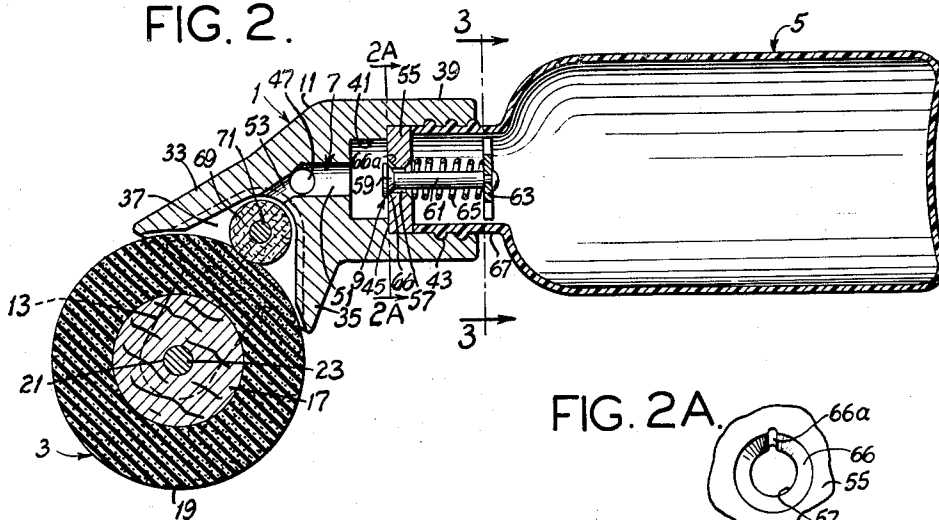


FIG. 2A.

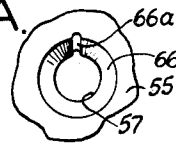
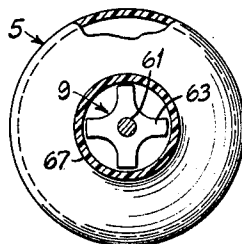


FIG. 3.



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2,932,045

FLUID-SUPPLIED ROLLER APPLICATOR

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10 Claims. (Cl. 15—132.5)

This invention relates to applicators for ink or the like, and more particularly to a fountain type of applicator for stencilling or similar operations.

Among the several objects of the invention may be noted the provision of a novel roller type of applicator particularly for applying ink in stencilling operations which enables increased speed in such operations; the provision of an applicator of this class which eliminates any necessity for accessory equipment such as ink pads, stamp pads, etc., the applicator being of the fountain type and holding its own supply of ink or other liquid; the provision of an applicator of this class which enables the use of a relatively thick ink; the provision of an applicator of this class having a valve means for controlling the flow of ink to the roller; the provision of an applicator of this class of such construction as to avoid spattering of ink; and the provision of an applicator of the class described which is economical to manufacture and reliable in operation. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

Fig. 1 is a forward end elevation of an applicator of this invention, parts being broken away and shown in section;

Fig. 2 is a longitudinal section taken on line 2—2 of Fig. 1;

Fig. 2A is an enlarged fragmentary view taken on line 2A—2A of Fig. 2; and

Fig. 3 is a transverse section taken on line 3—3 of Fig. 2, parts being further broken away and shown in section.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, Figs. 1–3 illustrate a force-feed squeeze-action type of fountain roller applicator of this invention comprising a body 1, a roller 3 carried by the body, and a collapsible container 5 constituting a reservoir for ink or the like and forming a handle. The container is detachably connected to the body, which has a passage therethrough generally indicated at 7 for flow of liquid (ink) from the container 5 to the roller 3 and valve means generally designated 9 for controlling the flow of liquid from the container 5 to the roller.

More particularly, the body 1, which may be cast of any suitable corrosion-resistant metal, for example, has a portion 11 constituting a head, and integral arms 13 and 15 extending at right angles to the head at its ends. The roller 3 comprises a rigid core 17 which may be made of hardwood, for example, having a soft, resilient, porous covering or sleeve 19 adhered thereto. This covering is preferably made of a very soft foam rubber. The core 17 has an axial hole 21 drilled through it receiving a pin 23. This pin at one end is threaded in a tapped hole 25 in the arm 15, and has its other end received in a

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hole 27 in the arm 13. A cap nut 29 is threaded on the threaded end of the pin to lock it in place. The roller 3 is rotary on the pin. The pin may be slotted at one end as indicated at 31 for easy removal.

As shown best in Fig. 2, the head 11 is generally of V shape in transverse section, the open side of the V being directed toward the roller. The wings of the V, which are designated 33 and 35, are divergent toward and have their outer edges closely adjacent the periphery of the roller to act as shields to prevent spattering of ink from the roller. The recess defined by the wings or shields 33 and 35 is designated 37. It extends throughout the length of the head from one arm 13 to the other arm 15.

Extending rearward from the head at its center is an integral cylindrical socket 39. The axis of this socket is angled with respect to the arms 13 and 15 with the arrangement such that the arms extend forward and downward from the head when the socket is in the horizontal position illustrated in Fig. 2. The socket 39 has a bore 41 and a threaded counterbore 43 at its outer end. The bore 41 constitutes the inner end of the passage 7. The shoulder at the inner end of the counterbore is designated 45. A hole 47 is drilled in the head 11 from one end and terminates short of the other end of the head (see Fig. 1). The outer end of the hole 47 is plugged as indicated at 49. A hole 51 is drilled in the head to connect the bore or chamber 41 and the hole 47. Holes 53 are drilled in the head from within the recess 37 to intersect the hole 47. These holes 53, four of which are shown, are spaced along the length of the hole 47.

The valve means 9 comprises a valve seat 55 constituted by a metal disk having a central port 57. A conical valve 59 made of corrosion-resistant metal has a stem 61 extending through the port 57. The valve seat 55 is fitted in the counterbore 43 seated against the shoulder 45. The valve 59 is located on the side of the valve seat toward the chamber 41, and the stem 61 extends outward through the port 57. A sheet metal spring retainer member 63 is fixed on the outer end of the valve stem 61 as by riveting. A coil compression spring 65 surrounds the stem 61 between the valve seat 55 and the member 63 and biases the valve 59 to a closed position seating against the seat 55. The port 57 in the valve seat is larger than the valve stem 61 so that liquid (ink) may flow through the port when the valve is opened, i.e., when the valve and valve stem are moved from the closed position shown in Fig. 2 to the left. The end of the port 57 toward the chamber 41 is tapered as indicated at 66 to receive the conical valve 59. In the taper 66 is a small groove 66a (see Fig. 2A).

The container 5 is preferably a one-piece plastic container of the squeeze bottle type. It is preferably molded of polyethylene and has an externally threaded neck 67 removably threaded in the counterbore 43 of the socket 39 with the end of the neck engaging the valve seat 55 to hold the latter in place. The container or bottle 5 is screwed tightly into the socket in order to form a liquid-tight seal between the end of the neck and the valve seat and between the valve seat and the socket. The member 63 on the outer end of the valve stem is sized to fit within the neck of the bottle and to act as a guide to prevent tilting of the valve stem 61 and valve 59 when the bottle is in place. Member 63 is also formed to allow for flow of liquid (ink) therearound and for flow of air therearound into the bottle. For this purpose, it may be made of cruciform shape as shown in Fig. 3. Any other shape is suitable as long as it provides for guiding of the valve stem in the neck of the bottle and for passage of ink and air around the member 63.

As shown in Figs. 1 and 2, the applicator is provided with a transfer roll 69 in the recess 37. This transfer

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roll, which is made of felt or other suitable absorbent material, is mounted on a pin 71 having one end threaded in a tapped hole 73 in the arm 15 and its other end received in a hole 75 in the arm 13. The transfer roll is in contact with the roller 3 and is adapted to hold a supply of ink for transfer to the roller 3. It is useful in cases where the applicator is to be used only infrequently, in which case the provision of a reserve supply of ink in the transfer roll is advantageous. In cases where the applicator is to be frequently used, the roll 69 may be entirely omitted.

Operation is as follows:

For filling the bottle 5 with ink, it is removed from the head 11 by unscrewing it from the socket 39. After it has been filled with ink, it is then screwed back into the socket. Care is taken to insure that the end of the neck 67 of the bottle seats tightly against the valve seat 55 to provide for sealing against leakage. When the neck of the bottle is screwed into the socket, the guide member 63 enters the neck of the bottle as shown in Fig. 2. By squeezing the bottle 5, pressure is applied to the valve 59 to cause it to open and to effect force-feed flow of ink from the bottle into the chamber 41, thence through the hole 51 to the hole 47 which serves as a manifold, and thence out through the holes 53 to the transfer roll 69. Upon rolling the roller 3 back and forth over a stencil, for example, the transfer roll is rotated to effect transfer of ink therefrom to the roller 3 and thence to the item being stencilled. In the cases where the transfer roll is omitted, the flow of ink is from the holes 53 along the inside of the wing 35 of the crossbar to the roller 3. Spattering or splashing of ink is prevented by the shields 33 and 35. When pressure on the bottle is released, the valve 59 closes, but air flows past the valve back into the bottle through the passage constituted by the groove 66a and the port 57 and around the member 63 quickly to restore the bottle to its expanded state. The groove 66a is sufficiently large readily to allow for flow of air but too small to allow any undue leakage of the ink (which is thick) when the valve 59 is closed.

The above-described squeeze-action type of applicator is especially suitable for the application of heavy viscosity ink because it enables the ink to be pumped out of the bottle and eliminates any necessity for waiting for gravity feed of ink, thereby saving time. It will be observed that by removing the bottle 5 the entire valve means 45 is readily accessible for cleaning when necessary.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. An applicator for ink or the like, and particularly for spreading a relatively thick ink over a stencil, comprising a head having an elongate recess therein, a transfer roll carried by the head extending lengthwise of and within the recess, an applicator roller carried by the head outside the recess and engaging said transfer roll, said roller having a soft, resilient, porous surface, said head having a manifold therein parallel to the transfer roll and adjacent the recess and a series of holes from the manifold to the recess spaced at intervals along the length of the manifold, a centrally located extension on the head having a passage leading into the manifold, a reservoir forming a handle secured to said extension, valve means in said extension for controlling the flow of ink or the like from the reservoir into the manifold, said extension comprising a socket, said reservoir comprising a squeeze bottle having a neck threaded in the

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socket, said valve means comprising a valve seat in the socket, a valve having a valve stem extending into the neck of the bottle, a spring biasing the valve to a closed position against the seat, said valve being adapted to open against the bias of the spring upon squeezing the bottle, and a guide on the valve stem slidable in the neck of the bottle, said guide being formed to allow for passage of ink and air through the neck of the bottle, said socket having a bore and a threaded counterbore at its outer end, providing a shoulder at the inner end of the counterbore, the valve seat being fitted in the counterbore against the shoulder, and the neck of the bottle being threaded in the counterbore against the valve seat.

2. An applicator as set forth in claim 1 wherein the valve seat has a central port, wherein the valve is located on the side of the seat toward the bore, the stem extending outward through the port and being smaller than the port, the guide being fixed on the outer end of the stem, and wherein the spring is a coil compression spring surrounding the stem and reacting from the seat against the guide.

3. An applicator for ink or the like, and particularly for spreading a relatively thick ink over a stencil, comprising a head having an elongate recess therein, a transfer roll carried by the head extending lengthwise of and within the recess, an applicator roller carried by the head outside the recess and engaging said transfer roll, said roller having a soft, resilient, porous surface, said head having a manifold therein parallel to the transfer roll and adjacent the recess and a series of holes from the manifold to the recess spaced at intervals along the length of the manifold, a centrally located extension on the head having a passage leading into the manifold, a reservoir forming a handle secured to said extension, valve means in said extension for controlling the flow of ink or the like from the reservoir into the manifold, said extension comprising a socket, said reservoir comprising a squeeze bottle having a neck threaded in the socket, said valve means comprising a valve seat in the socket, a valve having a valve stem extending into the neck of the bottle, a spring biasing the valve to a closed position against the seat, said valve being adapted to open against the bias of the spring upon squeezing the bottle, and a guide on the valve stem slidable in the neck of the bottle, said guide being formed to allow for passage of ink and air through the neck of the bottle, and said applicator being provided with a passage for flow of air past the valve into the bottle when the valve is closed, said passage being sufficiently large readily to allow for flow of air but too small to allow undue leakage of ink from the bottle when the valve is closed.

4. An applicator as set forth in claim 3 wherein the passage for flow of air is constituted by a groove in the valve seat.

5. An applicator for ink or the like, and particularly for spreading a relatively thick ink over a stencil, comprising a head having divergent front and back walls defining an elongate recess and having end walls at the ends of the recess, a transfer roll extending lengthwise of the recess between said end walls, arms projecting outward from said end walls beyond said front and back walls, a roller extending between and carried by said arms and engaging said transfer roll, said roller comprising a rigid core having a soft, resilient, porous covering, said front and back walls having their outer edges closely adjacent the periphery of the roller and thereby acting as shields to prevent spattering from the roller, said head having a manifold extending from near one end thereof to near the other within the juncture of the divergent front and back walls and a series of holes from the manifold to the recess spaced at intervals along the length of the manifold passage, a centrally located

socket extending rearward from the head with a pas-

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sage from the socket to the manifold, a squeeze bottle forming a handle and having a neck threaded in the socket, and valve means in said socket for controlling the flow of ink or the like from the squeeze bottle into the manifold comprising a valve seat carried by the head, a valve having a valve stem extending into the neck of the bottle, a spring biasing the valve to a closed position against the seat, said valve being adapted to open against the bias of the spring upon squeezing the bottle, and a guide on the valve stem slidable in the neck of the bottle, said guide being formed to allow for passage of ink and air through the neck of the bottle.

6. An applicator as set forth in claim 5 wherein the socket has a bore and a threaded counterbore at its outer end, providing a shoulder at the inner end of the counterbore, the valve seat being fitted in the counterbore against the shoulder, the neck of the bottle being threaded in the counterbore against the valve seat, wherein the valve seat has a central port, the valve being located on the side of the seat toward the bore, the stem extending outward through the port and being smaller than the port, the guide being fixed on the outer end of the stem, the spring being a coil compression spring surrounding the stem and reacting from the seat against the guide, and said valve seat having a groove for flow of air past the valve into the bottle when the valve is closed, said groove being sufficiently large readily to allow for flow of air but too small to allow undue leakage of ink from the bottle when the valve is closed.

7. An applicator for ink or the like, and particularly for spreading a relatively thick ink over a stencil, comprising a head, an applicator roller carried by the head, said roller comprising a rigid core having a soft resilient porous covering, said head having an elongate manifold therein extending generally parallel to said roller and a series of holes extending laterally from the manifold through the head spaced at intervals along the length of the manifold for conducting ink or the like from the manifold for application to the roller, said head having an extension constituting a socket extending therefrom with a passage leading from the socket into the manifold, a plastic squeeze bottle having a neck threaded in the socket, said bottle constituting a reservoir for the ink or the like and a handle for the applicator, and valve means for controlling flow of the ink or the like from the bottle into the manifold and allowing return of air to the bottle comprising a valve seat in the socket, a valve having a valve stem extending into the neck of the squeeze bottle, a spring biasing the valve to a closed position against the seat, said valve being adapted to open against the bias of the spring upon squeezing the bottle, and a guide on the valve stem slidable in the neck of the bottle, said guide being formed to allow for passage of ink and air through the neck of the bottle, and said valve means having a passage for flow of air past the valve into the bottle when the valve is closed, said passage being sufficiently large readily to allow for flow of air but too small to allow undue leakage of ink from the bottle when the valve is closed.

8. An applicator as set forth in claim 7 wherein the socket has a bore and a threaded counterbore at its outer end, providing a shoulder at the inner end of the counterbore, the valve seat being fitted in the counterbore against the shoulder, the neck of the bottle being threaded in the counterbore against the valve seat, wherein the valve seat has a central port, the valve being located on the side of the seat toward the bore, the stem extending outward through the port and being smaller than the port, the guide being fixed on the outer end of the stem, the spring being a coil compression spring surrounding the stem and reacting from the seat against the guide, and said valve seat having a groove

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for flow of air past the valve into the bottle when the valve is closed, said groove being sufficiently large readily to allow for flow of air but too small to allow undue leakage of ink from the bottle when the valve is closed.

9. An applicator for ink or the like, and particularly for spreading a relatively thick ink over a stencil, comprising a head having an elongate recess therein, a transfer member carried by the head extending lengthwise of the recess, an applicator roller carried by the head engaging the transfer member, said roller comprising a rigid core having a soft resilient porous covering, said head having an elongate manifold therein extending generally parallel to said transfer member and a series of holes extending laterally from the manifold to the recess spaced at intervals along the length of the manifold for conducting ink or the like from the manifold to the transfer member for application to the roller, said head having an extension constituting a socket extending therefrom with a passage leading from the socket into the manifold, a squeeze bottle having a neck threaded in the socket, said bottle constituting a reservoir for the ink or the like and a handle for the applicator, and valve means for controlling flow of the ink or the like from the bottle into the manifold and allowing return of air to the bottle comprising a valve seat in the socket, a valve having a valve stem extending into the neck of the bottle, a spring biasing the valve to a closed position against the seat, said valve being adapted to open against the bias of the spring upon squeezing the bottle, and a guide on the valve stem slidable in the neck of the bottle, said guide being formed to allow for passage of ink and air through the neck of the bottle, and said valve means having a passage for flow of air past the valve into the bottle when the valve is closed, said passage being sufficiently large readily to allow for flow of air but too small to allow undue leakage of ink from the bottle when the valve is closed.

10. An applicator as set forth in claim 9 wherein the socket has a bore and a threaded counterbore at its outer end, providing a shoulder at the inner end of the counterbore, the valve seat being fitted in the counterbore against the shoulder, the neck of the bottle being threaded in the counterbore against the valve seat, wherein the valve seat has a central port, the valve being located on the side of the seat toward the bore, the stem extending outward through the port and being smaller than the port, the guide being fixed on the outer end of the stem, the spring being a coil compression spring surrounding the stem and reacting from the seat against the guide, and said valve seat having a groove for flow of air past the valve into the bottle when the valve is closed, said groove being sufficiently large readily to allow for flow of air but too small to allow undue leakage of ink from the bottle when the valve is closed.

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