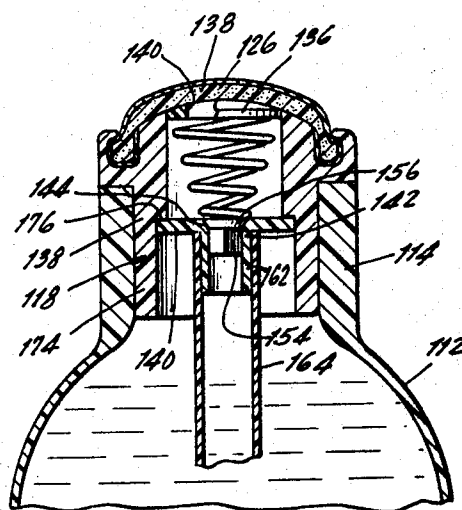
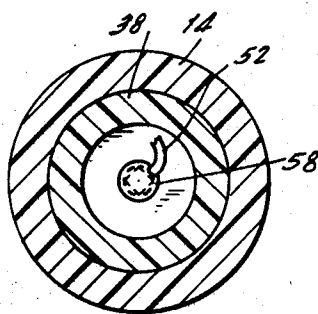
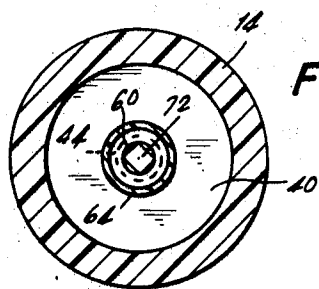
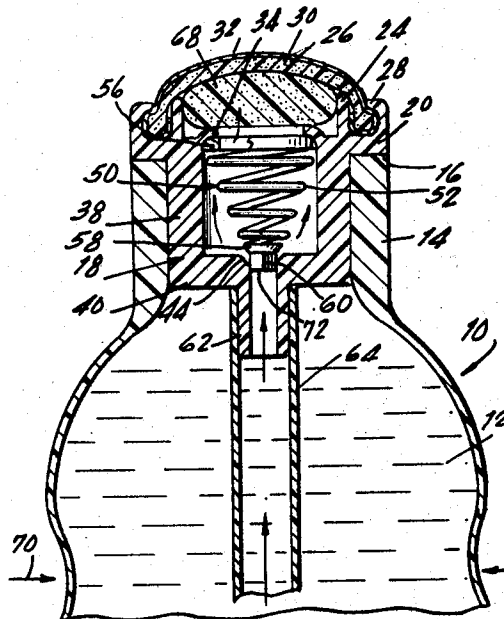
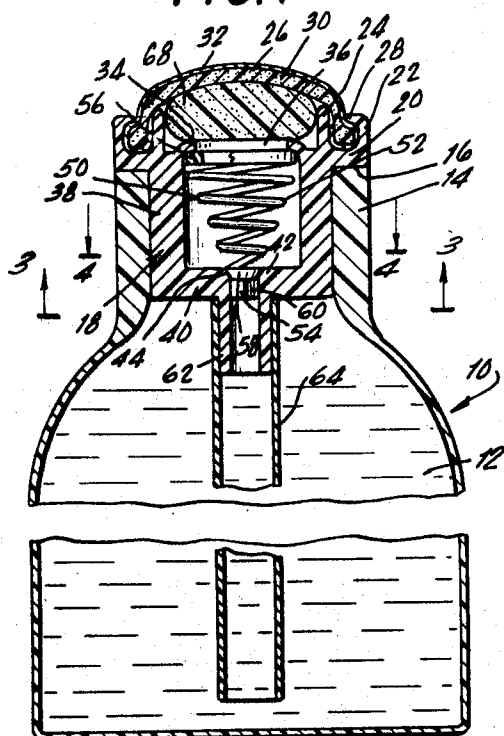


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SQUEEZE CONTAINER TYPE APPLICATOR

2 Sheets-Sheet 1



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3,390,940
SQUEEZE CONTAINER TYPE APPLICATOR
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1 Claim. (Cl. 401-186)

ABSTRACT OF THE DISCLOSURE

A fluid applicator comprising a flexible resilient fluid container having a neck terminating in an open end. A retainer ring having a projecting portion of reduced cross sectional dimensions is fitted in said neck. A porous resilient cover is secured to said retainer ring outwardly of said container. A web is snap fitted in the retainer ring and extends transverse of said retaining ring and has an aperture therethrough forming a valve seat. A valve member is arranged between the cover and the web is disposed for movement into and from engagement with the valve seat to control fluid flow through the aperture. Arcuately upwardly bowed spring fingers integrally formed with the valve member extending outwardly therefrom normally urging said valve member downward to a position closing the aperture so that fluid will exert pressure on the valve member to open the aperture upon application of suitable squeeze pressure on the container.

This invention relates to a device for applying fluid such as cosmetics or medications on the person of the user or for applying oils, polishes, and pigment containing material such as inks, paints or the like on any suitable surface, and more particularly to a squeeze container type fluid applicator.

An object of this invention resides in the provision of a fluid application for use in conjunction with a squeeze container for effectively applying fluid such as cosmetics, medications, pigmented material and the like on the skin of the user or on any other suitable surface.

In the past, various types of fluid applicators have been devised in which a valve assembly was located within the retaining ring of the applicator and inwardly of a web or other transverse member with the valve being normally operated upon orientation of the applicator against the surface on which the fluid is to be applied. With the advent of squeeze type containers and in accordance with the concepts of this invention, it is possible to utilize the pressure on the squeeze container to actuate the valve member so as to permit fluid flow onto a porous cover of the applicator suitably wetting the cover of the container with the fluid prior to orientation of the cover onto the surface to be coated with the fluid. When such squeeze containers are utilized, it is possible to locate the valve assembly quite close to the cover so as to more effectively control fluid flow, to eliminate or reduce evaporation of fluid not utilized, and to prepare the applicator for a measured application of fluid even on the first stroke of the applicator.

In carrying out the invention, there is utilized the concept of providing for fluid feed through an elongated tube directly against the valve portion so that force on the squeeze container will be transmitted into considerable pressure on the surface of the valve thereby permitting a relatively strong spring means to be utilized to normally hold the valve in place thereby achieving a better seal.

Another object of the invention resides in the provision of a fluid applicator in which the valve spring and valve member are integrally formed with the retaining ring.

Still further objects and features of this invention reside in the provision of a fluid applicator that is strong and durable, capable of being manufactured out of

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readily available materials in different sizes and for dispensing various types of fluids, and which is inexpensive to manufacture and efficient in use.

These, together with the various ancillary objects and features of the present invention, which will become apparent as the following description proceeds are attained by this squeeze container type applicator, preferred embodiments of which are illustrated in the accompanying drawings, by way of example only, wherein:

FIG. 1 is a longitudinal sectional view of a squeeze container type fluid applicator constructed in accordance with the concept of the present invention shown in the valve closed position;

FIG. 2 is a view similar to that of FIG. 1, but showing the applicator in a valve open position, after the squeeze container has had force applied thereto;

FIG. 3 is a horizontal sectional view taken along the plane of line 3-3 in FIG. 1;

FIG. 4 is a horizontal sectional view taken along the plane of line 4-4 in FIG. 1;

FIG. 5 is a partial sectional detail view showing a modification of the invention;

FIG. 6 is a vertical sectional view of the retaining ring and associated elements utilized in another embodiment of the invention in a valve closed position;

FIG. 7 is a vertical sectional view illustrating the retaining ring as inserted in the neck of a squeeze container and shown in an overturned position ready for fluid application after force has been applied on the fluid container;

FIG. 8 is a transverse section detail view taken along the plane of line 8-8 in FIG. 6;

FIG. 9 is a view similar to that of FIG. 6, but illustrating another modified form of the invention shown in a valve closed position; and

FIG. 10 is a view similar to that of FIG. 7 of the modified form of the invention shown in FIG. 9, but in a valve open position.

With continuing reference to the accompanying drawings, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates a flexible resilient fluid container having a suitable fluid 12 therein such as a medication, cosmetic, pigmented material or the like. The fluid container 10 has a neck 14 having an open end 16 into which the retaining ring 18 is inserted. The retaining ring 18 includes a horizontally extending flange portion 20 having an upwardly extending flange 22. Inwardly spaced of the flange 22 is a peripheral flange 24. A two-ply cover 26 is disposed between the flange 22 and the peripheral flange 24 and the end portion 28 of the flange 22 is swaged over to hold the cover 26 in place. The cover 26 includes a lower layer 30 of polyurethane foam and an upper layer 32 of a nylon knitted brushed fabric to which the lower layer 30 is bonded. The flange 20 rests on the end 16 of the neck 14. Integrally formed with the retaining ring 18 is dome-shaped flange 34 having a central aperture 36 therethrough. The lower portion of the retaining ring 18 is in the form of a projecting portion 38 of reduced cross sectional shape, the lower end of which has an integral web 40 provided with a circular opening 42 which has a tapered upper portion 44 also circular in cross sectional configuration.

Disposed in the space between the flange 32 and the web 40 and between the web 40 and the cover 26 is a valve assembly 50 including a coil spring 52, a valve member 54, and a ring 56 integrally formed with the spring 52. The valve member 54 is also integral with the spring 52 and has a truncated conical shaped portion 58 which engages the tapered portion 44 of the opening which forms a valve seat. The valve member 54 also includes a lower portion 60 which is square in cross sec-

tion. Integrally formed with the web 40 is a tubular extension 62 and an elongated tube 64 is disposed and secured about the tubular extension 62.

A body 68 of polyurethane foam, which is porous and resilient, is disposed between the flange 34 and the cover 26 and not only serves as a reservoir for fluid, but shapes the cover 26 into a dome-like configuration.

In use the spring is of considerable strength and normally forces the valve assembly 54 downwardly so that the truncated conical portion 58 engages the valve seat 44 to prevent fluid flow. However, upon suitable squeezing of the container in the direction as shown by the arrows 70, fluid is forced up through the tube 64 and applies considerable pressure on the square face 72 on the lower portion of the valve assembly thereby raising it to the position shown in FIG. 2 whereby fluid may pass through the space defined by the circular cross sectional shape of the opening 42 and the square cross sectional shape of the lower portion of the valve member. Thus, fluid can be metered directly onto the cover 56 in a controlled manner so that first or initial application of the cover on the surface to be coated will provide for an even application of fluid.

In FIG. 5 there is shown a modified form of the invention wherein the retaining ring 118 has the projecting portion 138 provided with a portion 174 of reduced cross sectional configuration forming a shoulder 176. The web 140 is not integrally formed with the projecting portion 138, but is spin welded or otherwise secured against the shoulder 176 and has integrally formed therewith a tubular extension 162. The web in this form of the invention is provided with an opening 142 therethrough which has a tapered portion 144 for engagement by the valve member 154 so that the conical portion 156 thereof will engage the tapered portion 140 of the opening to prevent fluid flow. In this form of the invention, the ring 136 has an arcuate upper surface 138 which directly engages a cover 126 and is provided with a central opening 140 therethrough. In this form of the invention the retaining ring is disposed in the neck 114 of the container 112 and an elongated tube 164 is disposed about the tubular extension 162.

Referring to the embodiment shown in FIGS. 6 through 8, reference numeral 210 generally designates a flexible container in which fluid 212 is disposed. The container 210 includes a neck 214 having an open end 216 into which the projecting portion 238 of a retaining ring generally indicated at 218 is disposed. The retaining ring is provided with a horizontally extending flange 220 which engages the shoulder 216 and an outer flange 222 as well as an upwardly extending peripheral flange 224. A two-ply cover 226 which includes a polyurethane foam thick layer 228 and an upper layer 230 of nylon knitted brushed fabric is held in place between the flanges 222 and 224 with the upper portion 232 of the flange 222 being swaged. Integrally formed with the flange 224 are three helical spring fingers 234, which, as can be seen in FIG. 6 are of a normally dome-shape in elevation and which have integrally formed therewith at the shoulder portion a valve member 246 which has a bevelled lower end 240 adapted to cooperate with a web 242. The web 242 is fitted within a peripheral groove 244 in the inner surface of the retaining ring and may be snap fitted into position. The web 242 is provided with a suitable opening 244 therethrough and the tapered portion 240 of the valve member 236 controls fluid flow thereto.

In use, application of pressure on the squeeze container 210 will cause fluid to pass against the valve member 236 forcing the valve member into an open position as shown in FIG. 7 and allowing fluid to flow onto the cover in a suitable manner so that the cover has a suitable amount of fluid thereon for application immediately onto the surface to be coated. It is especially to be noted

that this form of the invention is desirable for the more viscous fluids.

A modified form of the invention is shown in FIGS. 9 and 10 wherein the squeeze type container 310 has a projecting portion 338 of the retaining ring 318 disposed therein. The retaining ring has a cover 326 secured in place by the swaged flange portion 332 cooperating with the flange 334. Integrally formed with the flange 334 is a web 336 having a tapered opening 340 therein. A valve assembly 342 is snap fitted so as to be disposed at the peripheral intersection 342 and the web 336 and the flange 334 and includes a valve member 346 having a tapered portion 338 adapted to seat against the web portion defining the peripheral opening 340. The fingers 342 are similar in configuration of the fingers 234 of the embodiment of the invention shown in FIGS. 6 through 8 and normally urge the valve member 346 into a closed position as shown in FIG. 9. However, application of pressure on the squeeze container 310 will force the valve into the open position shown in FIG. 10 so that the fluid applicator is ready for coating a suitable surface.

A latitude of modification, substitution and change is intended in the foregoing disclosure, and in some instances, some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

I claim:

1. A fluid applicator comprising a flexible resilient fluid container having a neck terminating in an open end, a retainer ring having a projecting portion of reduced cross sectional dimensions fitted in said neck, a porous resilient cover secured to said retainer ring outwardly of said container, a web extending transverse of said retaining ring and having an aperture therethrough forming a valve seat, a valve member arranged between said cover and said web and is disposed for movement into and from engagement with said valve seat to control fluid flow through said aperture, and spring means integrally formed with said valve member extending outwardly therefrom normally urging said valve member downward to a position closing said aperture so that fluid will extend pressure on said valve member to open said aperture upon application of suitable squeeze pressure on said container, said valve seat being tapered, said valve member being tapered to intimately conform to the contour of said valve seat, said spring means comprising a plurality of arcuately upwardly bowed spring fingers integral with said retaining ring, said retainer ring having a peripheral groove in the inner surface thereof, said web being of larger diameter than the inner diameter of said retaining ring and being snap fitted in said groove and below said spring fingers.

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