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APPLICATOR HAVING MOVABLE HEAD

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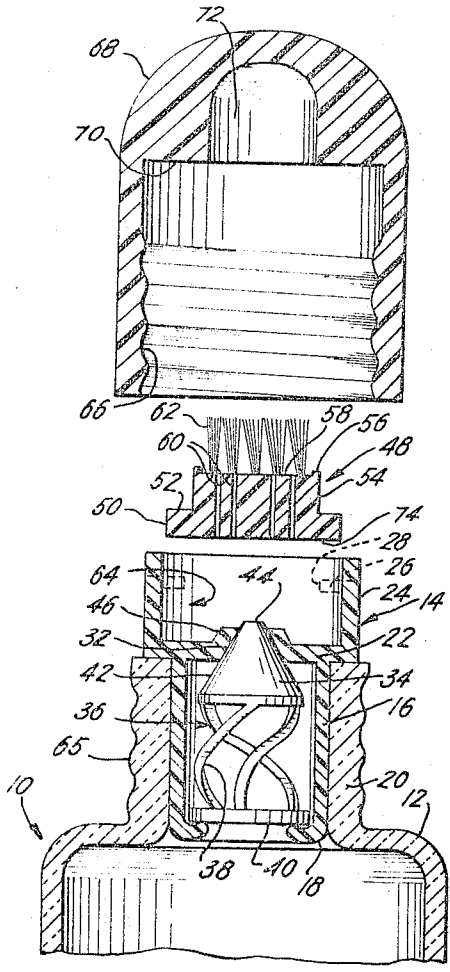


FIG. 1

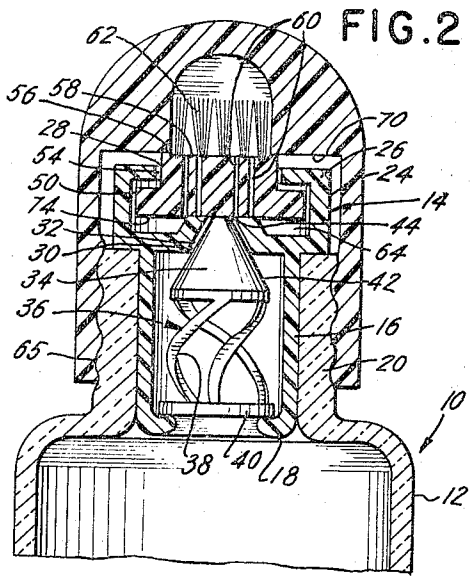


FIG. 2

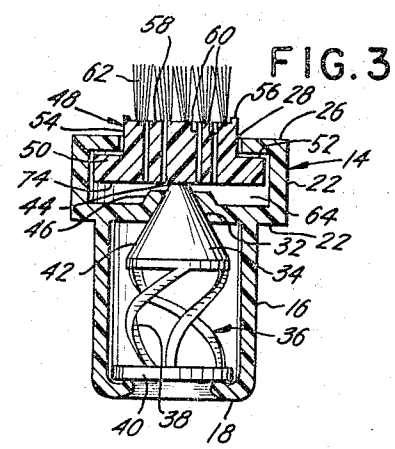


FIG. 3

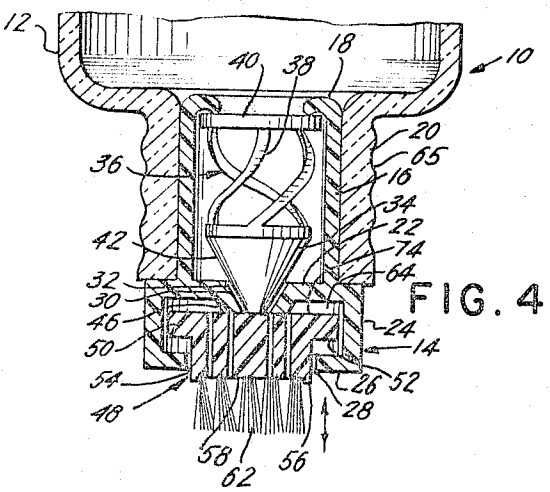


FIG. 4

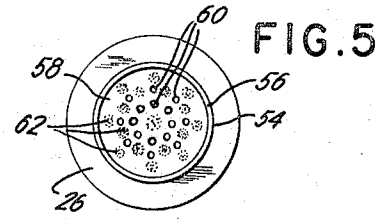


FIG. 5

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APPLICATOR HAVING MOVABLE HEAD

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8 Claims. (Cl. 15-581)

This invention relates to an applicator adapted for use in applying metered amounts of medications, cosmetics, polish, paints, ink, and other fluids of various viscosity on appropriate surfaces.

An object of this invention resides in the provision of means for facilitating the application of metered amounts of fluid to the applicator head for application to appropriate surfaces, and for providing means for maintaining the applicator within a substantially dome-like cover which effectuates a positive seal preventing fluid loss when the cover is affixed to the body of the applicator.

Another object of this invention resides in the provision of novel double acting valve means which is automatically actuated and adapted to meter the flow of fluids from the applicator for obtaining a metered flow of fluid onto the appropriate surface, independent of the contour or shape of the surface so that the fluid flow may be conveniently had onto the applicator head, which is provided with bristles, in a manner facilitating the metered application of fluid.

One of the features of this invention resides in the novel movable applicator head arranged to act in conjunction with the various parts of the applicator yet which is rotatable and longitudinally movably mounted.

One of the disadvantages of prior art daubers and applicators is that the applicator head, which is made of a porous resilient material, such as foam rubber, becomes deformed and often loses the desired shape thereof while becoming saturated with fluid. In order to maintain the desired shape, various inserts of sponge or foam material, reservoirs, or the like have been employed, but likewise these materials often become deformed and become saturated with fluid, and deteriorate as a result of being constantly saturated with fluid. Further, it is very difficult to control the amount of fluid which will be dispensed by the applicator in view of the fact that the applicator surface is constantly saturated with fluid. By the use of a double action valve mechanism which is capable of metered control of flow of fluids since no reservoir need be provided, and no sponge-like material is employed, it is possible to provide an accurate disbursement of fluid from the applicator.

A further object of the invention resides in the provision of an applicator having formed in one piece a body having a valve housing, a projecting portion for fitting in the neck of a bottle or other fluid container, an applicator head and a sealing cap or cover which is so arranged as to positively seal the applicator assembly when not in use, which applicator may be used for dispensing medications, cosmetics, shoe polish, ink or paints, in metered amounts, yet which is very inexpensive to manufacture since it requires only one main body part.

Further, it is an object of this invention to provide a fluid applicator which will be long lasting and not subject to deterioration wherein numerous applicator heads such as brushes, combs, daubers, felt nibs or the like may be employed with the identical construction valve assembly.

Further, it is an object of the present invention to provide an applicator having an applicator head and a closure cap, which when the cap is in a closed position will form a vapor lock within the cover to prevent leakage and/or evaporation of the fluid within the applicator or from the applicator head.

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Still another object of this invention is to provide a double acting spring actuated valve means for use in an applicator, which may be used with a plurality of different applicator surfaces such as brushes and daubers for dispensing metered amounts of fluid without any modification of the valve assembly.

Still further objects and features of this invention reside in the provision of applicator which not only is inexpensive to manufacture and simple to use, but which yields the unexpected advantage of permitting the metering of fluid of various viscosities in a very even and automatic manner, thereby preventing waste of fluid contained therein.

These, together with the various ancillary objects and features of this invention, which will become apparent as the following description proceeds are attained by this applicator, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

FIG. 1 is an exploded longitudinal sectional view of an applicator constructed in accordance with the concepts of the present invention as installed in conjunction with the container forming a part of the applicator;

FIG. 2 is a longitudinal sectional detail view of the applicator illustrating the valve member in a closed position, with the removable cap attached to the applicator;

FIG. 3 is a longitudinal sectional detail view illustrating the valve member in a second closed position;

FIG. 4 is a longitudinal sectional detail view of the applicator with the cap or cover removed and the applicator head in contact with a receiving surface; and

FIG. 5 is a top plan view of the applicator head with the cap removed.

With continuing reference to the accompanying drawings, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 is used to generally designate the applicator formed of nylon, rubber or polyethylene comprising the present invention. This applicator includes a container 12, in which a body 14 is fitted. The body 14 includes a projecting portion 16 of generally cylindrical shape, having a tapered lower end for convenience of inserting the projecting portion 16 in the neck 20 of the container 12. Further, the body 14 includes a web 22 which is integrally molded with the projecting portion 16. Extending upwardly from the web 22 is a flange or side wall 24 which terminates in an inwardly extending swaged upper lip 26. The interior edge 28 of the swaged lip 26 acts as a slip ring collar which purpose will become apparent as the specification continues.

The web 22 is provided with a raised central portion 46 having a tapered side wall 32 with a central opening 30 formed therein. The conical surface 34 of the valve assembly generally indicated as 36 cooperates with the tapered side wall 32 of the central opening 30 to form a valve seat. The valve assembly 36 includes a helical spring 38 the lower portion of which is integrally formed with a mounting ring 40. A helical spring is employed so that the conical valve surface 34 will be rotated slightly back and forth each time the conical valve assembly 36 is activated up and down so that any sediment which may accumulate in the dispenser body 12 will not be able to clog the central opening 30. The mounting ring 40 is held in place by the swaged lower end 18 of the body 14. The swaged end 18 of the body 14 retains the valve assembly 36 within the body 14. The spring 38 is in a continually stressed position under compression so that the tapered walls 40 of the conical surface 34 of the valve member 36 are continually urged into and against the tapered walls 32 of the opening 30 of the web 22 for the purpose of closing the opening and preventing the undesired flow or escape of fluid. The upper end of

the valve member 36 is formed with a flat surface 44 which when in the compressed position shown in FIG. 1 extends above the raised central portion 46 of the web 22. The raised central portion 46 is tapered and extends above the upper surface of the web 22. When in the position shown in FIG. 1, the flat end 44 of the conical tapered valve member 36 extends beyond the uppermost point of the raised central portion 46 of the web 22.

An applicator head generally designated as 48 is formed of a flexible plastic, rubber or nylon material, such as polyethylene, polyvinylchloride, having a generally circular shoulder portion 50 and a flat upper shoulder portion 52. Extending upwardly from the flat upper shoulder portion 52 is a neck portion 54 which terminates in an upwardly extending peripheral lip 56 which encircles the applicator brush holding section 58. The brush holding section 58 is provided with a plurality of fluid passages 60 which extend all the way through the applicator head 48. A plurality of tufts of bristles or the like 62 are appended thereto extending outwardly of the brush holding section 58.

The applicator head 48 is fitted into the interior 64 of the body 14 above the web 22 and then the lip 28 is swaged. Thus, the generally circular shoulder portion 50 of the applicator head 48 is disposed in the interior 64 of the body 14 in a manner so as to be rotatably encased between the inwardly extending lip 26 and the upper surface of the raised central portion 46 of the web 22. The interior edge 28 of the inwardly extending upper lip 26 encircles and loosely contacts the neck portion 54 of the applicator head 48. The shoulder portion 50 of the applicator head 48 extends outwardly within the interior portion 64 of the body 14 so as to be in a very close spaced relationship to the interior side walls of the body 14.

Once in position, the applicator head 48 is able to slide up and down within the interior 64 of the body 14 between the upper portion of the web 22 and the lower portion of the inwardly extending lip 26.

The neck 20 of the container 12 is provided with screw threads 65 which screw threads 65 are complementary to and adapted to cooperate with the screw threads 66 which are formed in the cap 68. Located within the interior of the cap 68 is a downwardly extending shoulder portion 70 which extends across the interior of the cap 68. A dome or hemispherically-shaped cutout or recess 72, into which the bristles or the like 62 can fit, is formed in the cap 68.

In use, with the body 14 installed in the neck 20 of the container 12 with the cap 68 removed, the applicator 10 is used in the following manner:

The entire applicator unit 10 is inverted so that the body 14 and the bristles 62 are facing downward toward the receiving surface as illustrated in FIG. 4. In this position, with the cap 68 removed from the container 12, the spring 38 exerts a force upon the conical valve member 36 so as to urge the tapered wall 42 into engagement with the wall or valve seat 32, thereby completely closing off the opening 30 and preventing the flow of the fluid from the interior of the container 12. In this position, the applicator head 48 is pushed toward the inwardly extending lip 26 so that the flat upper shoulder portion 52 abuts the surface of the inwardly extending lip 26. When the tapered wall 42 of the conical valve member 36 is in contact with the wall 32 thereby closing opening 30 in web 22. No fluid can pass from the interior of the container 12 to the applicator head 48. In order to permit fluid to pass through the communicating bores 60 of the applicator head downward pressure must be exerted on the applicator so as to cause the bristles 62 of the applicator head 48 to contact the surface on which the applicator is being used to apply material. When the applicator head 48 is forced back from the inwardly extending lip 26 toward the web 22, the conical valve member 36 is pushed toward the inwardly curved lower end 18 against

the force applied by the compression spring 38. As the conical valve member 36 is pushed toward the inwardly curved lower end 18, fluid passes between the side wall 32 and the surface 34 of the conical valve member 36 and out opening 30 in web 22. The amount of fluid which can pass through the opening 30 and through the communicating bores 60 is limited by the construction of this applicator since when the downward pressure is applied to the container body 12 so that the bristles or the like 62 press against the receiving surface, the base 74 of the applicator head 48 comes into contact with and abuts the flat upper surface of the upper extensions 46 of web 22. When the base 74 of the applicator head 48 comes to rest against the flat upper surface of the raised central portion 46, a seal is created which serves to prevent any additional flow of fluid from the container body 12 through the bores 60 in applicator head 48.

In order to obtain an additional flow of fluid, the user merely activates the applicator up and down so that the applicator head 48 slides up and down within the body 14.

In order to obtain a positive seal and prevent any leakage from the applicator when not in use, the threaded cap 68 is placed over the applicator assembly and is secured on so that the shoulder portion 70 of the cap 68 comes into contact with the peripheral lip 56 of the applicator head 48 thereby depressing the applicator head 48 so that the lower edge 74 of the applicator head 48 comes into contact with the upper extensions 46 of the web 22 thereby providing a positive fluid seal and preventing the undesired escape of fluid from the applicator 10.

One of the features of this invention resides in the safety and convenience of use of the applicator when applying strong acid or alkaline materials as are sometimes used in cleaning or treating materials, since the necessity of spilling fluid onto a cloth or the like is eliminated.

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 present invention herein.

I claim:

1. A fluid applicator comprising a body section, a valve assembly including a conical valve member, an inwardly curved lower end on said body section, a compression spring integrally formed with said valve member, means for maintaining said spring within said body section, a web provided with a raised central portion, said web having an opening extending through said raised central portion and having tapered side walls defining said opening, a flange extending upwardly from said web, said flange having an inwardly extending upper lip, an applicator head having a shoulder and a neck, said applicator head being disposed within said body between said web and said upper lip, and being axially and rotatably movable with respect to said web, said lip, and said valve member, said applicator head having a plurality of bores extending therethrough, and bristles appended to the outer surface of said applicator head spaced from said bores, said spring means urging a portion of said valve member through said opening into abutting relationship with said applicator head maintaining said applicator head in engagement with said upper lip and holding said bristles outwardly of said side wall.

2. A fluid applicator according to claim 1 wherein said head is provided with a peripheral lip, said peripheral lip extending above said outer surface of said applicator head, said peripheral lip encircling said bores and said bristles.

3. A fluid applicator according to claim 1 including a container, said body section being received in said container, said container being formed with a neck having

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screw threads thereon, an applicator cap having screw threads on the interior wall thereof complementary with said screw threads on said neck, and a hemispherically-shaped recess centrally located in said shoulder for receiving said bristles therein.

4. A fluid applicator comprising a container, a body section received in said container, a valve assembly including a conical valve member, an inwardly curved lower end on said body section, a compression spring integrally formed with said valve member, means for maintaining said spring within said body section, a web provided with a raised central portion, said web having an opening extending through said raised central portion and having tapered side walls defining said opening, a flange extending upwardly from said web, said flange having an inwardly extending upper lip, an applicator head having a shoulder and a neck, said applicator head being disposed within said body between said web and said upper lip, said applicator head having a plurality of bores extending therethrough, and bristles appended to the outer surface of said applicator head spaced from said bores, said spring means urging a portion of said valve member through said opening into abutting relationship with said applicator head maintaining said applicator head in engagement with said upper lip and holding said bristles outwardly of said side wall, said applicator head being provided with a peripheral lip extending above said outer surface and encircling said bores and bristles, said container having a neck provided with screw threads, a threaded cap secured on said neck, said cap having a recess therein for receiving said bristles.

5. A fluid applicator comprising a container, a body section received in said container, a valve assembly including a conical valve member, an inwardly curved lower end on said body section, a compression spring integrally formed with said valve member, means for maintaining said spring within said body section, a web provided with a raised central portion, said web having an opening extending through said raised central portion and having tapered side walls defining said opening, a flange extending upwardly from said web, said flange having an inwardly extending upper lip, an applicator head having a shoulder and a neck, said applicator head being disposed within said body between said web and said upper lip, said applicator head having a plurality of bores extending therethrough, and bristles appended to the outer surface of said applicator head spaced from said bores, said spring means urging a portion of said valve member through said opening into abutting relationship with said applicator head maintaining said applicator head in engagement with said upper lip and holding said bristles outwardly of said side wall, said applicator head being provided with a peripheral lip extending above said outer surface and encircling said bores and bristles, said container having a neck provided with screw threads, a threaded cap secured on said neck, said cap having a recess therein for

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receiving said bristles, said cap having a shoulder therein, said shoulder when said cap is threaded on said neck to a closed position engaging said peripheral lip and forcing said applicator head towards said raised central portion to close said opening in said web.

6. A fluid applicator comprising a container a body section received in said container, a valve assembly including a conical valve member, an inwardly curved lower end on said body section, a helical compression spring integrally formed with said valve member, means for maintaining said helical spring within said body section, a web provided with a raised central portion, said web having an opening extending through said raised central portion and having tapered side walls defining said opening, a flange extending upwardly from said web, said flange having an inwardly extending upper lip, an applicator head having a shoulder and a neck, said applicator head being disposed within said body between said web and said upper lip, said applicator head having a plurality of bores extending therethrough, and bristles appended to the outer surface of said applicator head spaced from said bores, said helical spring means urging a portion of said valve member through said opening into abutting relationship with said applicator head maintaining said applicator head in engagement with said upper lip and holding said bristles outwardly of said side wall, said applicator head being provided with a peripheral lip extending above said outer surface and encircling said bores and bristles, said container having a neck provided with screw threads, a threaded cap removably securable on said neck, said cap having a recess therein for receiving said bristles, said cap having a shoulder therein, said shoulder when said cap is threaded on said neck to a closed position engaging said peripheral lip and forcing said applicator head towards said raised central portion to close said opening in said web.

7. A fluid applicator according to claim 6 wherein said conical valve member and said helical spring are formed of polyethylene.

8. A fluid applicator according to claim 6 wherein said conical valve member and said helical spring are formed of nylon.

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