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3,410,645

CONCAVE DIAPHRAGM APPLICATOR

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FIG. 1

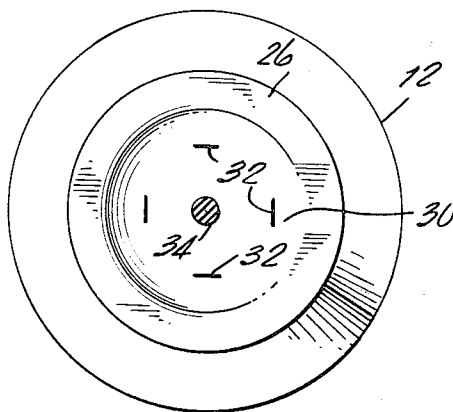
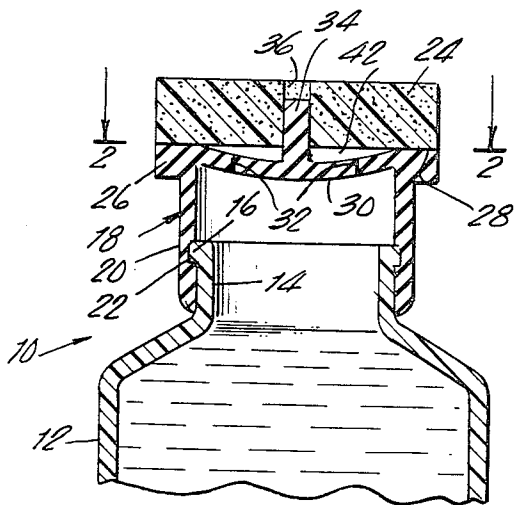


FIG. 2

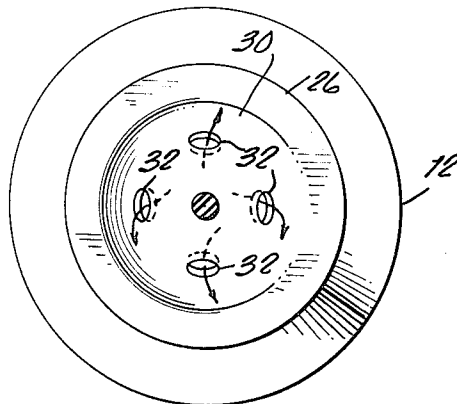


FIG. 4

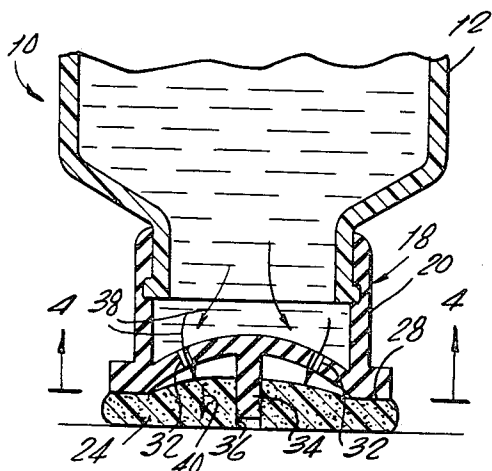


FIG. 3

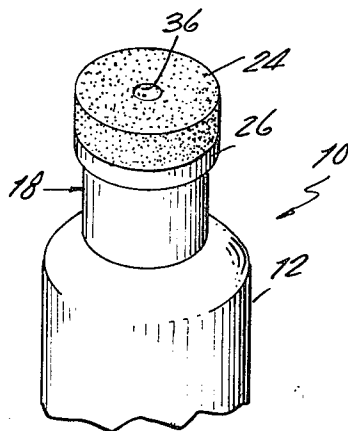


FIG. 5

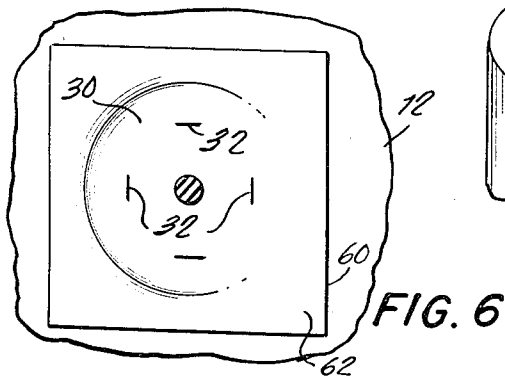


FIG. 6

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CONCAVE DIAPHRAGM APPLICATOR
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ABSTRACT OF THE DISCLOSURE

An applicator for applying shoe polish, medications, cosmetics, and the like comprising a body having a projecting portion attached to a container. A relatively thick flange at the top of the projecting portion has a substantially flat surface to which a sponge-like pad is bonded. Integral with the flange and the projecting portion is a diaphragm having normally closed slits therein. A stud is integral with the diaphragm and extends into the pad and upon depression of the pad and the stud the diaphragm will flex inwardly to open the diaphragm for permitting and directing fluid flow against the pad for optimum application of the fluid on the surface to be covered.

This invention relates to an applicator applying on any suitable surface various types of fluids such as shoe polish, pigments, cosmetics, medications or the like. Briefly, the concept of the invention resides in the utilization of a diaphragm integral with a relatively thick flange which supports a sponge-like padded bonded to the flange and spaced from the diaphragm. The diaphragm has slits therein so that upon actuation of a stud integral with the diaphragm the slits will open and the diaphragm will direct fluid against the under surface of the pad for optimum application of the fluid.

A further object of the invention resides in the provision of a device for applying shoe polish or like fluid which is initially sealed so as to provide for long shelf life and reduced evaporation.

A further object of the invention resides in the provision of an applicator made out of two simple parts of readily available materials, which has a novel streamlined and highly attractive appearance, yet which is substantially foolproof and effective in operation and capable of applying fluids into even tight corners and crevices such as often occur on shoes and like surfaces.

Still further objects and features of this invention reside in the provision of an applicator which is simple in construction, strong and durable, capable of being manufactured at an extremely low cost, yet which is highly effective in use.

These, together with the various ancillary objects and features of the invention, which will become apparent as the following description proceeds, are attained by this concave diaphragm applicator, a preferred embodiment of which is shown in the accompanying drawing, by way of example only, wherein:

FIG. 1 is a longitudinal sectional view of the applicator shown mounted on a container and in the normally closed position;

FIG. 2 is a sectional detail view taken along the plane of line 2—2 in FIG. 1 showing the device in the normally closed position;

FIG. 3 is a view showing the device in use with the diaphragm in the open position;

FIG. 4 is a sectional detail view looking in the direction of line 4—4 in FIG. 3 showing the diaphragm with the slits in their open position;

FIG. 5 is a perspective view of the applicator; and,

FIG. 6 is a top plane view of a modified form of the applicator.

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With continuing reference to the accompanying drawing wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 is used to generally designate an applicator constructed in accordance with the concepts of the present invention, and which is designed to be used in combination with a container 12 having a neck 14 provided with a lip 16. The applicator includes a body generally indicated at 18 and having a projecting portion 20 provided with a groove 22 therein for receiving the lip 16 which is snap fitted therein for holding the body 18 to the container 12. It is within the concepts of the present invention to use threaded means in lieu of the snap-fitting arrangement or to fit the projecting portion 20 within the neck 14. Nevertheless, the snap fitting arrangement of the lip 16 and the groove 22 provides for better support for a pad 24 mounted at the top of the body 18.

The body 18 further includes a flange 26 which is relatively thick and extends outwardly to provide a substantially large and substantially flat supporting surface 28 to which the pad 24 is affixed by heating sealing or adhesive bonding. Integrally formed with the flange 26 and the projecting portion 20 is a diaphragm 30 which extends transverse of the projecting portion 20 forming a web across the projecting portion. The diaphragm 30 is normally concave downwardly and has four slots 32 therein each extending normal to a radius of the web 30 and offset 90 degrees from each other. Rising from the center of the web is a stud 34 which extends more than half way up the pad 24 and sits in a central hole or bore 36 formed in the pad 24. The slots 32 are formed by utilizing hot knives which cut the slots but when withdrawn permit for the synthetic plastic matter from which the body 18 is formed to seal the slots 32 in a positive manner preventing any fluid flow until the seals which are frangible are broken.

Depression of the stud 34 which would come from normal pressure of the applicator on a suitable surface as is shown in FIG. 3, will cause the diaphragm 30 to flex inwardly opening the slits as shown in FIG. 4 to permit fluid from the container 12 to flow outwardly in the direction of arrows 38 and through the sponge as indicated by arrows 40. The removal of pressure on the sponge-like pad 24 will cause the diaphragm 30 to flex inwardly and pump the remaining fluid in the enlarged reservoir 42 onto the undersurface of the pad 24 so that light pressure insufficient to flex the diaphragm may then be used to coat with the pad 24 of the applicator the surface being treated. The reservoir 42 is defined by the undersurface of the pad 24 and the web 30.

In FIG. 6 there is shown a modified form of the invention in which the flange is generally indicated by reference numeral 60 and is of rectangular shape, while the pad 62 is likewise of rectangular shape otherwise the parts are similar.

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. An applicator comprising a body having a projecting portion for attachment to a container, an outwardly extending relatively thick flange at the top of said projecting portion having a substantially flat upper surface, a relatively thin resilient flexible diaphragm integral with said flange and said projecting portion and extending transverse to said projecting portion forming a web across said projecting portion, a stud integrally formed with said

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diaphragm rising upwardly therefrom, said diaphragm being concave downwardly and having spaced normally closed slits therein, and a sponge-like pad bonded to said flange and spaced from said diaphragm forming a reservoir between said pad and said diaphragm, said pad having means therein for receiving said stud so that pressure on said pad will cause said diaphragm to flex and open said slits.

2. An applicator according to claim 1, including frangible sealing means initially integrally sealing said slits until first depression of said pad.

3. An applicator according to claim 1, wherein said pad is formed of foamed polyurethane.

4. An applicator according to claim 1, including a container having a lip, said projecting portion having a groove in the inner surface thereof, said lip being snap fitted in said groove.

5. An applicator according to claim 1, wherein said stud extends more than half the thickness of said pad, said pad having a hole therein receiving said stud.

6. An applicator according to claim 1, wherein said flange and said pad are circular in shape.

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7. An applicator according to claim 1, wherein said flange and said pad are rectangular in shape.

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