ABSTRACT: A flexible impervious gland is connected to a cylindrical body and both the gland and body are sandwiched between two halves of a sponge. A passage is formed within the body and a valve is mounted within the passage. An aperture communicates the passage with the gland and a second aperture communicates the passage with the outside wall of the body. The gland serves as a reservoir for liquid such as soapy water. In one embodiment, a manually rotatable cap or head is connected to the valve. Upon rotation of the cap, the valve moves into and out of a blocking relationship with the aperture which communicates the passage with the outside wall of the body. When the valve is not blocking the aperture, the gland may be squeezed to force liquid from the gland, through the passage and out through the aperture to the sponge. In a second embodiment, the valve is spring loaded and normally blocks the aperture which communicates the passage with the gland. A cap is connected to the valve and when the cap is pressed in a direction opposed to the bias of the spring, the valve is opened. The gland may be squeezed to force the liquid from the gland out onto the sponge.
APPLICATOR FOR LIQUIDS

The invention relates to applicators and is particularly directed to sponge-like applicators having internal reservoirs for the housing of portions of liquid which may be discharged from the reservoirs when desired to provide a layer of liquid on the outer surfaces of such applicators.

It is known to employ sponge-like devices within which soap or detergent-containing reservoirs are mounted to clean such objects as cars, walls, ceilings, floors and glasses. Such devices are compact and may be handled easily. Many such devices may be held in a variety of positions. In addition such devices have few or no protruding parts which can damage the surface of the object which is being cleaned.

Known sponge-like devices have a number of disadvantages. Frequently no provision is made for the selective release of a portion of soap or detergent from the reservoir. The user of the device must contend with a constant flow of soap or detergent from the reservoir until the reservoir is empty; the user has no ready means for stopping the flow. Another common disadvantage of such devices is that no simple means is provided for filling the reservoir. In addition many such devices will not dispense soap or detergent unless they are held in a particular position. Gravity is employed to move the fluid from the reservoir to the sponge, therefore when the device is not held in the required position, no cleaning fluid will flow from the reservoir.

It is accordingly an object of the present invention to provide an applicator having an internal reservoir for liquid and having means for selectively discharging portions of liquid in desired quantities onto the outer surface of the device.

It is another object to provide a device having simple means for refilling a reservoir or, where a refillable reservoir is not required, an inexpensive device which may be discarded after the contents of its reservoir have been depleted.

It is another object to provide an applicator which is durable and simple and inexpensive of manufacture.

It is another object to provide an applicator which conserves liquid and is therefore less expensive in operation than similar known devices.

These and other objects may be accomplished by providing an applicator including: a flexible gland forming a reservoir for liquid; an outer covering of spongelike material surrounding the gland; a body secured at one end to the gland and having an outer wall with at least one aperture formed therein, the body further having a passage formed therein, the passage and the aperture serving as a conduit for the flow of liquid from the gland to the outer covering; a valve positioned within the body passage for selective interruption of the flow of liquid; and a head connected to the valve and positioned at the other end of the body for selective manipulation of the other end of the body for selective manipulation of the valve.

A fuller understanding of the invention may be had by referring to the following description of preferred embodiments of the present invention taken in conjunction with the accompanying drawing in which:

FIG. 1 is a perspective view of one embodiment of the applicator according to the invention;

FIG. 2 is a sectional view of an element of the applicator illustrated in FIG. 1 along line 2—2 of FIG. 1;

FIG. 3 is a partial perspective view of a second embodiment of an element of the applicator and

FIG. 4 is a sectional view on line 4—4 of FIG. 3.

Like reference characters refer to like parts throughout the description of the drawing.

With reference to FIG. 1, an applicator according to the invention is illustrated. The applicator is generally indicated 10 and includes body 12, head 14, gland 16 and outer covering 18.

Gland 16 is formed of flexible impervious material such as rubber. The gland is adapted to serve as a reservoir for liquid. The open end of the gland is secured to body 12, preferably by means of a ring 20 which contacts the gland about its opening and is retained within an annular groove 22 formed about the outer wall 24 of body 12.

Gland 16 and body 12 are surrounded by outer covering 18 of spongelike material. Preferably as illustrated, covering 18 takes the form of a sponge in the shape of an oblong solid. The sponge is severed into two halves and the halves are hollowed to accommodate gland 16 and body 12. The halves of the sponge are joined with the gland and body 12 and are secured together by gluing. A pair of diametrically opposed wings 26 are provided to resist rotation of body 12 relative to covering 18. Wings 26 are secured to outer wall 24 and extend therefrom. A plurality of projections extend from the wings to ensure that the wings firmly secure contacting surfaces of covering 18.

Body 12 is generally cylindrical in shape and is bored along the length thereof so as to provide a passage for the flow of liquid. The passage is illustrated in FIG. 2 and is shown defined, in part, by inner wall 28. An annular constricting 30 is formed within the passage in proximity to one end of body 12 which constricting terminates at end 32 of body 12.

A valve 34 is mounted axially within the passage and the valve is secured to one end of a stem 36 also mounted axially within the passage. Head 14 is secured to the other end of stem 36 and as shown, head 14 is sleeve-shaped having a cylindrical portion 38 closed at end 40. Portion 38 is internally threaded, as at 42 the threads being adapted to mate with external threads 43, formed about end 44 of body 12. Preferably valve 34, stem 36 and head 14 are of one piece molded construction.

It will be evident that upon rotation of head 14 in one direction, the head will travel axially of body 12 in the direction indicated by the arrow and valve 34 and stem 36 will also travel axially. Further travel of valve 34 will be prevented when the inside wall of end 40 of the head contact end 44 of body 12 and the facing surfaces of valve 34 and constriction 30 contact one another.

The exterior wall of valve 34 facing inner body wall 28 is in sealing contact therewith thus the valve serves to block the flow of liquid through the passage. It will be evident that as head 14 rotates, so will valve 34 therefore the cross section of both the passage and the valve must be substantially circular. It is to be understood, however, that the cross sections of the valve and passage need not be circular. If an opening is formed along the length of the valve to accommodate the stem and if a pair of flanges is connected to the stem each flange being in contact with an opposite end of the valve, it will be evident that the valve will not rotate with the stem when the head is rotated. Movement of the stem along the length of body 12 will however be transmitted to the valve. In such a case, the cross sections of the valve and passage need not be circular but must, however, be substantially the same in order for the valve to be in sealing contact with the inner wall of the body.

At least one aperture 46 extends from inner wall 28 to the outer wall 24 of body 12. Preferably, a series of apertures 46 are arranged circularly about body 12. With reference to FIG. 2, when valve 34 (shown in full lines) is in the position illustrated, apertures 46 are not blocked and liquid may pass by constricted 30 and outwardly through apertures 46. When however head 14 is rotated so that valve 34 travels to the position indicated by dashed lines, apertures 46 will be blocked and no liquid may pass therefrom.

In operation, head 14 is unscrewed from body 12 and separated therefrom thereby withdrawing valve 34 from the passage formed in body 12. Sufficient liquid is then poured through the inlet at end 32 to fill gland 16. Valve 34 is then reinserted into the passage and head 14 is manually rotated to advance valve 34 into contact with the facing surface of constriction 30. Valve 34 in such a position prevents liquid from flowing outwardly through apertures 46 via the constriction.

When it is desired to discharge liquid onto covering 18, it is merely necessary to rotate head 14 in the direction which tends to separate facing surfaces of valve 34 and constriction 30. When valve 34 has passed by apertures 46, compressively inwardly directed force applied to the gland will urge liquid out of the gland and through the apertures onto covering 18.
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With reference to FIG. 3, a modified body according to the second embodiment of the invention is illustrated. The body, indicated 50 is adapted to be used in conjunction with gland 16 and outer covering 18 and as a substitute for body 12 illustrated in FIGS. 1 and 2. Body 50 may be joined to gland 16 as above and is positioned between halves of covering 18 as illustrated. Unlike the embodiment illustrated in FIGS. 1 and 2, however, liquid is discharged onto covering 18 by the application of pressure to head 52 simultaneously with the application of compressive inward force to gland 16.

As with body 12, body 50 is generally cylindrical in shape and is bored along the length thereof so as to provide a passage for the flow of liquid. As illustrated in FIG. 4, the passage is defined in part by inner wall 54. An annular constriction 56 is formed within the passage and surface 58 defines both an end of body 50 and an inlet for the flow of liquid from gland 16 to the passage. The end of body 50 opposite surface 58 is designated end 60.

A valve 62 is mounted axially within body 50. Valve 62 is made up of disc 64 and sealing ring 66 and, as illustrated in solid lines in FIG. 4, is adapted to contact surface 58 which forms a valve seat to block the inlet. Valve 62 is secured to stem 68 and the stem extends axially through the inlet, along the passage to connect with head 52 positioned about body 50 at end 60. Resilient means in the form of a helical spring 70 is positioned about stem 68 and has one end which contacts a surface of construction 56 and the other end which contacts head 52.

Head 52 is sleeve-shaped and has a hollowed portion 72 adapted to slidably receive an end of body 50. Preferably head 52 is in sealing relationship with body 50 when so received so that liquid within the passage may not pass between the facing walls of body 50 and head 52. It is contemplated however that head 52 will be flush with the outer wall of covering 18. It will therefore not be a serious problem if liquid leaks through the facing walls of body 50 and head 52 since such liquid will collect on the covering. Thus head 52 need not be in sealing relationship with body 50.

Force applied in the direction indicated by the arrow and opposed to the bias of spring 70 will urge head 52 and valve 62 to the position shown in dashed lines and fluid from gland 16 may move by constriction 56 and into the passage formed in the body. As seen, there is an annular opening about stem 68 at the inlet so that liquid may pass therethrough when valve 62 is in the desired position. As body 50 and head 52 are preferably in sealing relationship when the head is connected to stem 68 as shown, liquid will not pass along the passage and outwardly at end 60.

As with body 12, at least one aperture 74 is formed in body 50 which extends from inner wall 54 to the outer wall of body 50.

In operation, gland 16 is preloaded with liquid, the gland is secured to body 50 and the two parts are sandwiched between two parts of an outer covering 18, preferably a sponge. Spring 70 urges head 52 away from constriction 56 thereby bringing valve 62 into sealing engagement with valve seat 58. No liquid will therefore flow through the inlet and into the passage. When it is desired to discharge liquid onto the sponge, it is merely necessary to apply force to head 52 opposed to the bias of spring 70 to open valve 62 and, at the same time, to apply pressure to gland 16 to urge liquid out of the gland, through the inlet, passage and outwardly through apertures 74 onto the sponge. The direction of force is indicated by the arrow in FIG. 4.

It is intended that an applicator incorporating body 50 be disposed of after the liquid in the gland is depleted. It is contemplated, however, that the gland may be refillable. Means by which the gland may be refilled will readily occur to those skilled in the art but suggested means included a flexible tube having one end connected to the gland and through which liquid may be fed into the gland from an inlet at the other end, which inlet may be plugged when the gland is not being refilled. Where the halves of outer covering 18 are releasably connected together so that access may be had to the gland, the gland may be refilled by separating the halves and removing ring 20 to separate gland 16 from the inner wall of the outer covering.

It is contemplated that the applicator according to the invention may dispense such liquids as soap, detergent, cosmetic oils, liquid waxes, lubricants and chemicals.

It will be understood, of course, that further modifications can be made in the embodiments of the invention described and illustrated herein without departing from the scope and purview of the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. An applicator including: a flexible gland forming a reservoir for liquid, an outer covering of spongelike material surrounding the gland; a body secured at one end to the gland and having an outer wall with at least one aperture formed therein, the body further having a passage formed therein, the passage and the aperture serving as a conduit for the flow of liquid from the gland to the outer covering; a valve positioned within the passage for selective interruption of the flow of liquid; and a head connected to the valve and positioned at the other end of the body for selective manipulation of the valve.

2. The applicator as claimed in claim 1 wherein said passage is defined by an inner wall of said body, said aperture extending from the inner wall to the outer wall, said valve having an exterior wall in sealing contact with the body inner wall for preventing liquid from passing thereby; said valve and said head being secured to a stem positioned within the passage; said head being positioned at the other end of the body, the head being threaded so securely to the body such that, upon rotation of the head relative to the body in one direction, the valve advances along the passage to block the aperture thereby preventing liquid from passing therethrough and upon rotation in the opposite direction, the valve retreats from blocking relation with the aperture so that liquid may pass therethrough.

3. The applicator as claimed in claim 1 wherein said body further includes a valve seat within the passage and an inner wall, said aperture extending from the inner wall to the outer wall, said valve when in contract with the valve seat, serving to block the flow of liquid from the gland to the outer covering and being biased into contact with the valve seat by resilient means, the passage being open to permit liquid to pass from the outer covering by the application of force to the head which opposes the bias of the resilient means so that the valve moves out of contact with the valve seat.

4. The applicator as claimed in claim 1 wherein said body is sleeve-shaped and has an annular constriction mounted within the passage which constriction has a pair of opposed surfaces, one surface thereof facing the gland and forming a valve seat; said head also being sleeve-shaped and having an interior wall facing the other surface of the annular constriction, the head mounted about the body at one end thereof and adapted to slide therealong, said applicator further including a stem secured to the valve and positioned within the passage; and a helical spring mounted about the stem having one end contacting the head facing surface of the annular constriction and the opposite end contracting the interior wall of the head.