April 24, 1962 M. A. MOSKOVITZ 3,031,104

ACCESSORY FOR A FLUID DISPENSER

Filed Aug. 25, 1958

FIG. 1

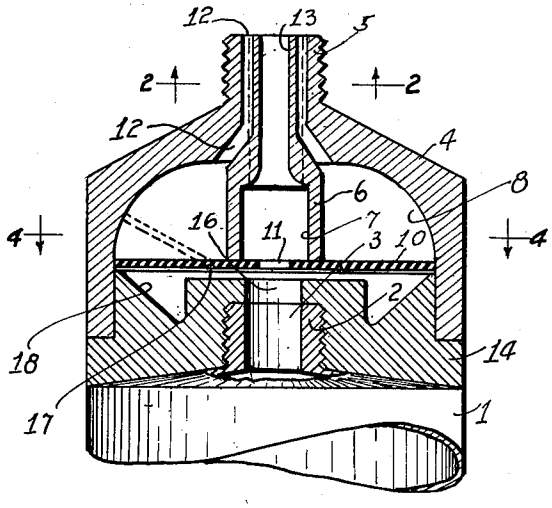


FIG. 2

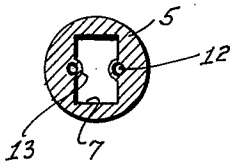


FIG. 3

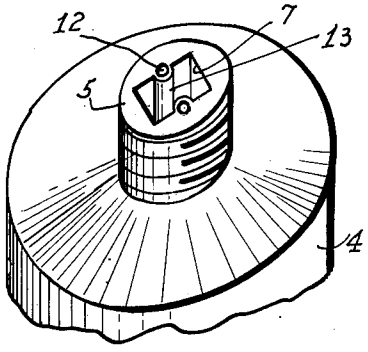


FIG. 5

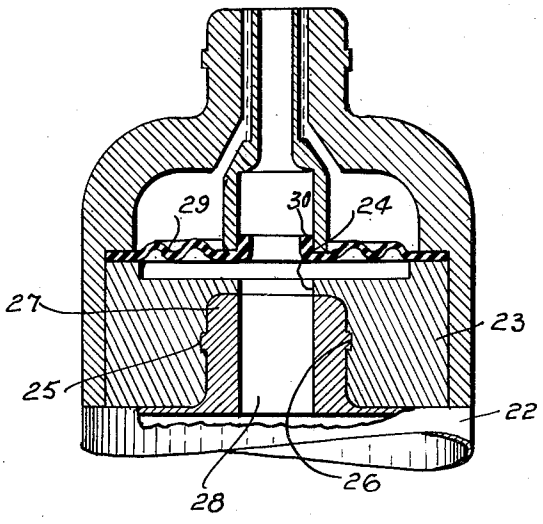
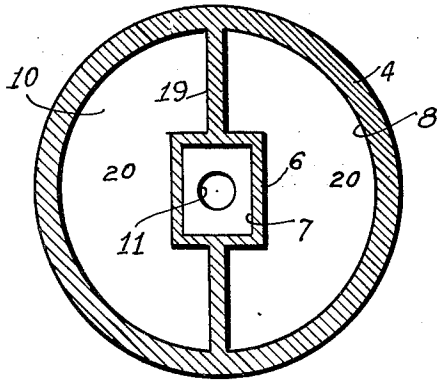


FIG. 4



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3,031,104
ACCESSORY FOR A FLUID DISPENSER

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This invention relates to fluid dispensers generally, and more especially to a device for dispensing two or more fluids simultaneously from a single unit.

One of the principal objects of my invention is to so construct an adapter or accessory containing one or more additives or secondary materials, detachably mountable on a primary dispenser filled with a principal material, so that forcing of material from the primary dispenser will of itself force said additive material or materials to commingle with the primary material at the point of ultimate delivery of the latter.

Another object of the invention is to so construct such a device that a series of the same can be used selectively as desired, with the primary dispenser, so that such additives containing colorings, flavorings, antiseptics, medicants, etc., may be delivered simultaneously with the primary material, to thereby enlarge the scope of usefulness or marketability of the primary material dispenser by enabling the use of a single primary dispenser with a series of additive containing adapters as the material is consumed from the primary dispenser.

A further object of my invention is to so construct such an adapter to include means operable by the force of ejection of the primary material, to control the feeding of said additive material, said means sealing against reverse flow of said additive material, and also regulating the proportion of additive material delivered concurrently with primary material.

Many other objects and advantages of the construction herein shown and described, and the uses thereof, will be obvious to those skilled in the art to which this invention appertains, as will be more clearly apparent from the disclosures herein given.

To this end, my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and the uses mentioned, as will be clearly set out in the claims hereunto appended.

In the drawings, wherein like reference characters represent like or corresponding parts throughout the views,

FIGURE 1 is a longitudinal cross-sectional view through the adapter, showing a portion of the primary receptacle on which it is mounted;

FIGURE 2 is a cross-sectional detail, taken substantially along the line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary perspective view showing the delivery end of the adapter;

FIGURE 4 is a cross-sectional detail view showing a modified construction, for delivery of more than a single additive material; and

FIGURE 5 is a view somewhat similar to that shown in FIG. 1, of a modified form of adapter.

There are many instances where it is desired to dispense two or more fluid materials together in predetermined proportions to one another, as for instance where it is desired to apply a germicide or antiseptic rinse, flavoring or coloration to tooth paste as the latter is applied onto the brush, or to dispense an additive material that should not be overlong in contact with a primary material for reasons of incompatability or where deterioration of one product on the other is apt to occur.

My invention proposes to employ a standard primary material filled receptacle that is commonly sold in that condition, and which may be used to dispense said primary material alone. However, it is often desirable to

combine said principal material with additives, and in this case, the merchant may continue to stock the usual primary-containing product, and also carry a line of adapters each filled with an additive product, so that if demand for any specific additive drops off, the loss in inventory value would be on the additives only and not on the much higher priced main product.

Referring more particularly to the drawings, wherein I have shown preferred embodiments of my invention, there is indicated in FIG. 1 a fragmentary portion of any form of commonly used receptacle 1, such as a collapsible tube, squeeze bottle or the like, from whence fluids, including paste-like materials may be successively expressed in suitable increments, this receptacle provided at its issue end with a reduced neck portion 2 that has a discharge outlet 3 therethrough that communicates with the contents of the receptacle in the usual manner. A suitable cap or other closure (not shown) is commonly used to removably seal said outlet and in this instance is shown as threadedly received on said neck portion.

In order to enlarge the field of use of the standard item of merchandise so packaged, by adding a secondary material or materials to combine with the principal material at the point of ultimate delivery at the time of consumption, I have formed an adapter to be detachably mounted on said principal receptacle so that the contents of the latter and of said adapter will be dispensed simultaneously from the combined unit. I have also provided means whereby the amount of said additive material has a definite proportionate relationship to the amount of principal material, and all of such relationships controlled by the simple forcible expression of the material from the primary material receptacle.

Such an adapter includes a shell or casing 4 preferably made of a suitable inexpensive and preferably chemically inert material, such as plastic or the like, one end of this shell being provided with a hollow neck portion 5 of substantially the same external size and shape as that of the neck portion 2 of the principal receptacle so that a single cap may be interchangeably used on either the main receptacle or the adapter.

Spaced centrally within said shell is an axially extending portion 6 having an opening 7 entirely therethrough to the exterior of the adapter, said opening adapted to register with that of the main receptacle when the adapter is mounted in position on the latter.

An annular chamber or reservoir 8 is thus formed in said shell between the radially outermost wall of the tubular portion and the inner bounding wall of the shell, to provide storage for any sort of additive material intended to be dispersed onto the primary material at the point of ultimate delivery, and in the forms shown, said bounding wall of the shell interior is concave so as to provide a domed chamber.

Feed control means, as a pressure-transmitting actuator member 10 is provided within the shell for forcing said additive material from the reservoir upon forcible ejection of primary material, said member being preferably of a suitable resiliently yieldable plastic or a rubber-like material.

This pressure-transmitting member comprises a flat disk positioned to bridge across the lower enlarged end of the shell and seat against the lowermost end of the tubular portion 6, said disk having a central opening 11 therethrough, of an area that is smaller than that of the opening through the neck 2 and which is also preferably smaller than the size of the opening through the adjacent end of the tubular portion of the adapter, and is in registry with both of said openings, said size relationship to be more fully explained hereinafter.

One or more ducts or passageways 12 lead from the reservoir 8 to adjacent the farthermost outer point of

the opening 7 through said neck portion 6, being radially spaced only a slight distance from said opening, as shown, if desired, and opening at the end of said neck portion.

In the form shown in FIG. 1, there is a rib 13, or the like projection extending longitudinally along the bounding wall of the opening 7 so that material forced through the latter opening will have a longitudinal groove formed therealong, formed by the rib, and into which groove additive material may inlay.

A plug 14 is used to close the lower end of the shell, bridging across the latter and sealed thereto to form the single unit. The lower end of this plug is shaped to snugly fit on the delivery end of the principal receptacle, as by being internally screw-threaded to be threadedly mountable on the threaded neck of the principal receptacle, and having its opening 16 in registry with and preferably of the same area as that through said neck 5.

The outermost end of said plug is spaced slightly from the pressure-transmitting member so that when material is forcibly expressed from the principal receptacle a major portion of the same will flow upwardly through the tubular opening 7, permitting a minor portion of the same to be directed radially outwardly through the space between the plug and the pressure-transmitting member to press against the latter and actuate the same to sweep in an arc inwardly into the reservoir and thereby force some of the additive contents therefrom to commingle with the principal material at the ultimate point of delivery. In the form shown, this additive material will form an inlay in and along the groove of the principal material.

The pressure-transmitting member has a line of weakness 17 to provide increased flexibility therealong to insure its proper flexing under pressure, and obviously, the smaller the area of opening 11 through the member the greater the pressure on the latter upon squeezing the principal container, and this principle is used to predetermine the proportion of the ingredients that are dispensed together.

To further insure that the pressure on the principal material is transmitted to the outer portions of the pressure-transmitting member, the face of the plug that is opposed to the radially outermost portion of the member is recessed or made into an annular channel 18, the outermost bounding wall of the latter diverging outwardly toward the terminal edge of the member. Thus, material from the principal container is caused to flow upwardly along the inclined wall of the channel into engagement with the adjacent opposed surface of the actuator member.

The action of the member 10 is dependent upon just how strong a resistance it has to flexing due to pressure from below. If it has little or no resistance to such flexing, then as soon as the pressure on the main receptacle is released, the member 10 will remain substantially in its flexed position (indicated in dotted lines in FIG. 1), so that a subsequent squeeze on the main receptacle will flex said member 10 a slight further increment, such operations continuing until all of the material in the chamber 8 is forced out.

On the other hand, if the member 10 has a strong retrieving action, so as to require more force on the main receptacle to actuate said member, then as soon as said force is released, said member 10 retrieves toward its original position, this retrieving motion acting to force a slight amount of the material that is beneath said member either back into the opening 3, or out through the opening 7, or in both directions, this amount of overflow being quite slight and being collected onto the tooth-brush or the like immediately following the release of the pressure on the main receptacle.

Also, inasmuch as there is some compressibility of the material in the chamber 8, as it is obvious that there are some voids in the material there, a release of said compressing will permit the material to again expand in volume as compared with its compressed form, to thereby press said member 10 toward its original position (shown in full lines in FIG. 1).

In the modification shown in FIG. 4, a partition 19 is provided in the shell, to form two separated reservoirs 20—20, enabling different materials to be stored separately and yet be expressed simultaneously onto the primary material upon actuation of the valve.

In the form shown in FIG. 5, the adapter is shown as having a different form of detachable mounting onto the principal receptacle 22, and in this case the lower end of the plug 23 has its central opening 24 with an internal groove 25 to be snapped about a circumferential rib 26 of the neck 27 of the receptacle 22, said plug having its central opening 28 of substantially the same size as that of the opening 24 and in registry therewith.

Of course, in order to use the same or identical seal cap on the delivery end of the adapter, as is mounted on the primary receptacle as sold, the neck end of the adapter is formed so as to be identical with that of the neck of the primary receptacle.

The additive material reservoir is formed substantially as hereinbefore described, but if desired, the pressure-transmitting member may be made differently, as for instance, by using a corrugated plastic or rubber-like resiliently yieldable disk, diaphragm or membrane 29 whose peripheral edge is held clamped between the opposed edges of the plug and shell.

The central portion of said disk has a sleeve 30 that is snugly received within the lower end of the tubular portion of the shell, the opening through the sleeve being of smaller area than that through the opening through the neck of the principal receptacle so that a portion of the total pressure exerted on the primary material is directed to flex said disk, the remaining portion of the force actuating the primary material through the sleeve and opening through the tubular portion of the shell.

The member 29 will act in somewhat the same manner as the member 10. Since it is made easily yieldable or deformable, it will be retained substantially at the position it was when pressure was released on the principal receptacle, so that at the next subsequent pressure on the latter, the member 29 will stretch slightly further to press more material from the secondary chamber. On the other hand, if said member 29 has a strong retrieving characteristic, it will return to its sealing position indicated in FIG. 5, on release of pressure on the principal receptacle, somewhat in the manner of the member 10 hereinbefore described.

I claim:

1. An accessory for mounting wholly exteriorly on a fluent-dispensing receptacle that has a discharge opening at one of its ends for expressing principal material therethrough, comprising an annular shell mounted at one end of said receptacle and having an axially-extending tubular portion entirely axially beyond said discharge opening and open therethrough from end to end and in communication with said discharge opening to define a discharge opening through said shell, and with an additive-material reservoir positioned wholly annularly about said tubular portion, said reserovir being open across its inner end and provided with a discharge duct to communicate with said principal material expressed through said shell discharge opening, a plug bridging across the inner end of said shell and mountable on said receptacle and that has a central opening in registry with said discharge openings through said tubular portion and receptacle, and a pressure-transmitting member positioned between said plug and receptacle to form a movable end closure for said receptacle and yieldably movable by engagement with the principal material expressed from said receptacle to thereby force said additive material from said reservoir concurrently with the discharge of said fluent through said tubular portion, said pressure transmitting member having a central

opening in registry with but smaller in area than said central openings through said plug and receptacle, so that one portion of said fluent material passes as a discharge through said tubular portion while another portion of said tubular portion engages and actuates said pressure-transmitting member.

2. An accessory as set forth in claim 1, and further characterized in that said pressure-transmitting member fixedly engages an end wall of said tubular portion.

3. An accessory for mounting wholly exteriorly on a fluent-dispensing receptacle that has a discharge opening at one end for expressing principal material therethrough comprising an annular shell mounted at said one end and an axially-extending tubular portion entirely axially beyond said opening and open from end to end and in communication with said opening to define a discharge opening through said shell, and with an additive-material reservoir positioned wholly annularly about said tubular portion, said reservoir being open across its inner end and provided with a discharge duct to communicate with said

principal material expressed through said shell discharge opening, a plug bridging across the inner end of said shell and being mountable on said receptacle and has a central opening in registry with said discharge openings through said tubular portion and receptacle, and a pressure-transmitting member positioned between said plug and reservoir to form an end closure for the latter and being yieldably movable by engagement with said principal material expressed from said receptacle to force said additive material from said reservoir concurrently with the discharge of said principal material through said tubular portion, said reservoir having a concave bounding wall, and the radially outer edge of said pressure-transmitting member shaped to sweep along said concave wall during operative movement of said member.

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