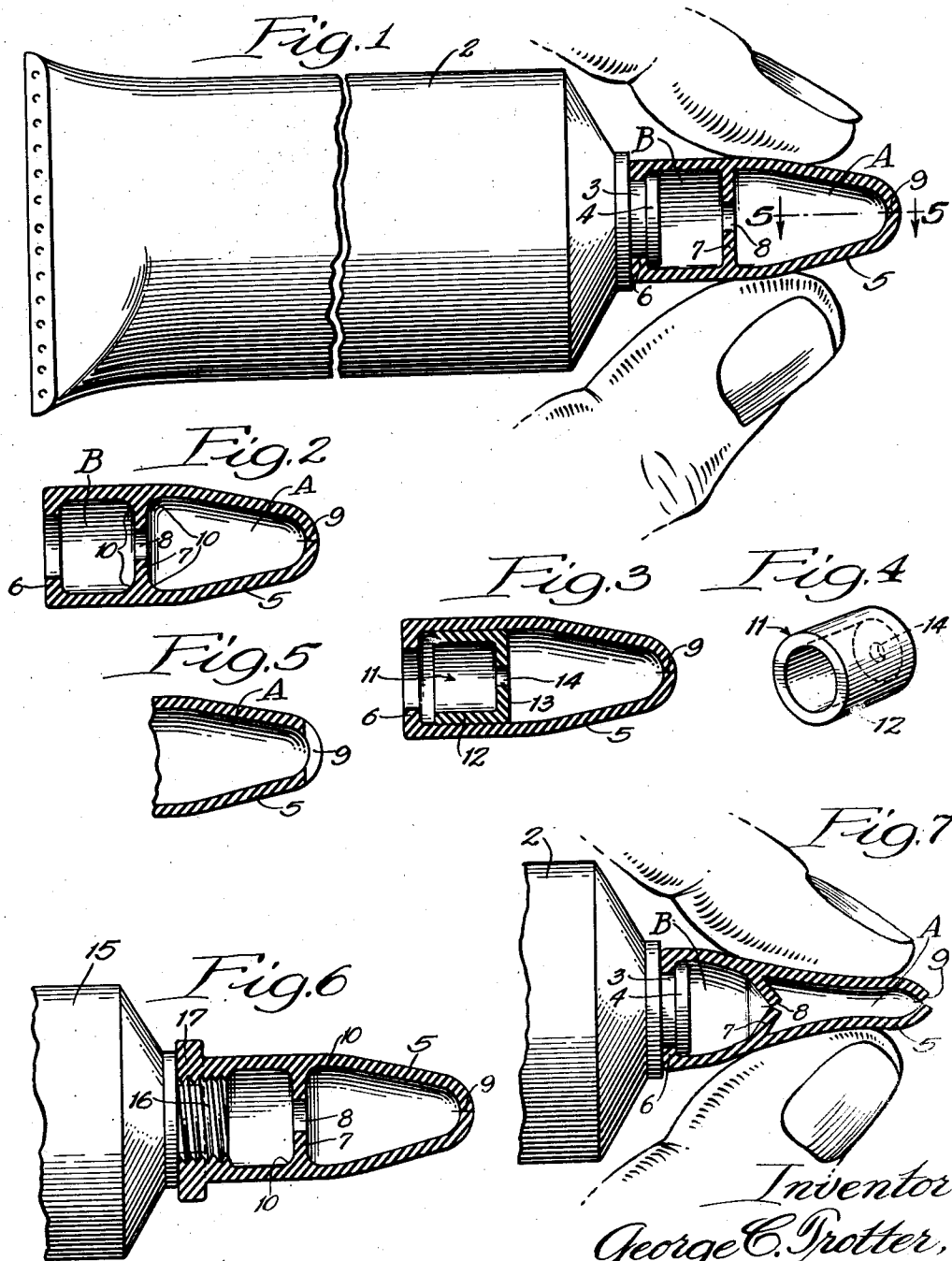


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DISPENSING DEVICE
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DISPENSING DEVICE

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8 Claims. (Cl. 221-60)

This invention relates to a dispensing means to be applied to the dispensing opening of collapsible tubes, bottles, and other containers for toothpaste, shaving cream, lotions, and similar substances of a plastic, semi-liquid or liquid form.

As is generally known, toothpaste, shaving cream and similar substances are customarily put up in collapsible containers provided with a screw-threaded dispensing neck and sealed by means of a screw-threaded cap. In some instances other kinds of removable caps are used which are secured to the neck or body of the container by such means as bayonet-slot connections and the like. Such devices are costly to make and add considerably to the expense of marketing the products and it is a well known fact that removable caps are inconvenient and often a source of annoyance to the user.

Numerous attempts have been made to obviate this added expense and source of annoyance by providing dispensing tops of one kind or another to replace the removable cap. Generally speaking, such devices take the form of a compressible nipple which serves as a closure for the tube or other container and which, by the application of pressure, is intended to cause extrusion of the contents of the nipple.

Insofar as I am aware, devices of this character heretofore proposed fall into two general classes based on their mode of use or operation: those in which the collapsible tube or other container is pressed to force a portion of its contents into the nipple and those in which the tube or container is inverted so as to permit the contents thereof to flow by gravity into the nipple. Both of these kinds of devices have serious objections and consequently they have not been adopted commercially notwithstanding the great need for something to replace the removable cap. Those which depend for operation upon pressure applied to the tube or container are objectionable because two hands are required to manipulate them and if the nipple should become only slightly clogged the result may be that the pressure may cause the tube or container to burst. The kind that depends upon gravity flow cannot be used for toothpaste, shaving cream or other cosmetic creams which do not flow freely.

It is also quite generally the practice to make glass containers for liquids such as tonics, lotions, and the like with a very small dispensing orifice.

Such glass containers are expensive to make and difficult and expensive to fill. The use of my invention, as will hereinafter more fully appear, will obviate the necessity of such expensive glass container constructions. My device may be applied to the necks of bottles having what may be called a normal, large, dispensing opening and will enable the user conveniently to dispense the contents thereof in such small quantities as may be desired, a result which is now sought to be accomplished by restricting the dispensing orifice in the neck of the container.

My invention aims to provide a dispensing nipple which may be applied to collapsible tubes or other containers for pastes, creams and liquids and which in operation will successfully dispense the contents thereof without applying pressure to the container and which is conveniently operated by one hand.

The device of my invention is in reality a small force pump which may be applied to the dispensing neck of tubes, bottles or other containers and is made of resilient material, so that by alternately applying and releasing pressure upon the device the contents of the container will be drawn into the device and expelled therefrom through a discharge opening provided therein.

More specifically stated, it is the object of my invention to provide a resilient dispensing top for tubes, bottles and other containers which in operation acts as a pump to draw and expel the contents of the container and which, when not in operation, serves as a secure sanitary seal for the container.

With the foregoing objects in mind, and others which will develop as the description proceeds, I will now describe in detail a practical embodiment of my invention. It is to be understood, however, that in making such detailed description I do not thereby limit myself to the precise structural features so set out, as it will be quite clear to those skilled in the art when my basic idea has been explained that the same may be embodied in other forms employing the principle of my invention but without departing from the scope thereof as defined in the appended claims.

In the drawing:

Fig. 1 is a view of a container in the form of a collapsible tube with the dispenser of my invention applied thereto, the dispenser being shown in longitudinal section;

Fig. 2 is a view in longitudinal section of a slightly modified form of my dispenser;

Fig. 3 is a view in longitudinal section of a further modification;

Fig. 4 is a perspective view of the insert illustrated in Fig. 3;

Fig. 5 is a fragmentary longitudinal sectional view of the dispenser taken on the line 5—5 of Fig. 1;

Fig. 6 is a longitudinal sectional view of my dispenser applied to a container having a screw-threaded neck; and

Fig. 7 is a view similar to Fig. 1 showing my dispenser in its collapsed or deformed state when finger pressure has been applied.

Referring now to the drawing, the reference numeral 2 indicates a collapsible tube of the type generally used for the marketing of toothpaste, shaving cream, or other cosmetic creams and lotions. As my device is intended to be secured to the top of the container by the manufacturer thereof, or by the manufacturer of the contents, to serve as a permanent top and dispenser for the contents, it is unnecessary that the neck of the tube or container shall be screw-threaded or provided with any of the other common means by which a removable cap may be secured thereto.

In the instance of the tube 2, here illustrated, there is provided a neck portion 3 which is provided with a flange 4 with which my device will interlock so as to remain securely in fixed position thereon.

My device comprises a somewhat elongated member 5 which may be generally characterized as a nipple. It is made of highly resilient material such as natural rubber, synthetic rubber or any other synthetic plastic composition which, when molded into a hollow member, will possess sufficient resiliency to tend always forcibly to assume its fully distended position when no deforming pressure is applied.

As will be seen from the drawing, the member 5 is hollow and is provided at its base with an inwardly extending circumferential locking flange 6 adapted to engage under the flange 4 on the container. The flange 6 can be snapped over the flange 4, thus providing a very simple and easily applied connection.

Within the said hollow member I provide a partition 7 which has a centrally located aperture 8. This partition in the preferred embodiment of the invention herein illustrated is integrally formed with the body of the member 5 and of the same material so that it also is resilient, whereby it may be deformed to close the aperture 8 when pressure is applied to it and whereby it will resume its normal position with the aperture open when the pressure is released.

The resilient partition 7 thus forms a restriction within the hollow interior of the member 5 and divides the interior into two chambers or compartments, marked A and B.

The member 5 is provided with a discharge opening 9 in its tip, as shown in Figs. 1 and 5. This discharge opening may be formed by producing a very fine slit in the member 5 while the member is stretched as, for example, over a mandrel. The slot may also be formed from the inside of the nipple by any suitable thin, sharp tool. When my device is adapted for the dispensing of liquids, I may employ fine perforations instead of a slit, the perforations being formed by puncturing the nipple from the inside out by means of a fine tool. The purpose of forming the slit or perforations in this manner is to assure

that they will always be self-closing and self-sealing. They remain in such self-closing, self-sealing condition on account of the inherent resiliency of the material of the member 5 and because of the fact that the slit or perforations have been formed when the said material is stretched.

In the modification illustrated in Fig. 2 there is only a very slight difference from that heretofore described. The difference resides in that the partition 7 is so molded with the body portion of the device as to include fillets 10 which provide for rounded corners at the point of junction of the partition and the body portion.

Fig. 3 illustrates a further modification. In this case instead of having a partition which is integrally molded with the body portion of the device, I provide an insert generally indicated by the reference numeral 11 comprising a cylindrical wall 12 having a substantially flat circular end wall 13 provided with an aperture 14. The wall 13 is substantially the same as the partition 7 described in connection with the other embodiments of my invention. It may be that in some cases it will be easier from the manufacturing standpoint to insert this cylindrical member 11 into the device 5 than to mold the partition 7 integrally within it.

In Fig. 6 I have illustrated the application of my invention to an ordinary collapsible tube which in this case is provided with a screw-threaded neck 16. In this embodiment of the invention the member 5 is provided at its base with a somewhat thickened screw-threaded attaching portion 17 instead of the interlocking flange 6 described in connection with the other embodiments of my invention. To facilitate threading the member 5 on to the screw-threaded neck 16 the exterior configuration of the attaching portion 17 may be hexagonal or other non-round form.

In practice I have found that the effectiveness of my device appears to be related to the size of the aperture 8 in the partition 7. Within limits I find that the smaller the aperture, the greater will be the effect of the suction created in the chamber A of the nipple when pressure is released to draw material into the nipple. The size of this aperture will also be partly determined by the nature of the substance to be dispensed. For example, in dispensing liquids which flow rather freely, the said opening may be made somewhat smaller than when dispensing creams of relatively high consistency such as toothpastes and the like.

As I have already pointed out, the partition 7 in Figs. 1 and 2, and the partition 13 in Fig. 3 are made of resilient material. Consequently, when the nipple is collapsed or deformed by the application of finger pressure, the said partition will tend to assume the position shown in Fig. 7, or it may tend to assume a position pointing inwardly into the chamber B. In either event the resilient partition is deformed. The instant finger pressure on the nipple is released, this partition will also tend to resume its normal position and in so doing it tends to supplement the inherent resiliency of the nipple itself to restore the same to its normal shape.

In the commercial use of my invention the dispensing nipple will be applied to the tube or container at the factory and the purchaser will buy the same with the dispenser attached. Although unnecessary, I think in shipment and during handling, the discharge opening of the dispenser may

be sealed by an easily removable tape made, for example, of cellophane, Holland cloth, or the like, which will be removed by the purchaser when he commences to use the device.

5 The operation is as follows: Assume a tube of toothpaste or the like with a device of my invention attached thereto. My device is hollow and may initially be free from any of the contents of the tube. Finger pressure is now applied to the
10 dispensing nipple approximately on the line of the partition 7 and the same will be squeezed so as to substantially completely collapse the nipple as shown particularly in Fig. 7. This will also deform the partition 7 in the manner shown in
15 said figure, or in the opposite direction as heretofore explained. The result is that the aperture 8 in the partition 7 will be closed and thus communication is cut off between the two chambers A and B of the nipple. Any air which may be in the compartment A is therefore expelled
20 through the discharge slit 9. Upon release of the finger pressure the nipple will tend to resume its normal shape by reason of its inherent resiliency supported or supplemented by the resiliency of the partition 7. Thereupon a partial vacuum will be created in the chamber A and as
25 the aperture 8 is now open this partial vacuum will tend to draw some of the contents of the tube into the nipple to fill the same.

30 To initiate the operation of the device, a few alternate applications and releases of finger pressure will be required in order to prime the pump, as it may be described. But once the nipple has been filled with the contents of the tube or container, finger pressure thereon will cause a portion of the contents to be expelled through the
35 dispensing slit 9. The instant the material leaves the discharge slit, said slit will close whether or not pressure on the member is released. Thus, the material will be cut off cleanly by the
40 discharge slot and there is no opportunity for air to enter through it and into the nipple. Upon release of the finger pressure, new material will enter into the nipple as above described and so
45 the use of the device may continue until the material in the tube has been entirely expelled.

The user may, of course, roll up the collapsible tube from the bottom as the contents is gradually depleted, as is now quite the general practice.

50 It will be observed that the operation of my device requires only the use of two fingers of one hand, whereas prior devices attempting to produce my result, require the use of two hands. With my device it is not necessary to squeeze the
55 tube in order for the contents to be drawn into the dispensing nipple, as has been necessary with devices of this character heretofore proposed.

Thus, my device is very simple in construction and operation and effectively solves the long existing problem of providing a practical dispensing
60 top for tubes and other containers to eliminate the expensive and annoying removable caps heretofore generally employed.

65 It will be understood, of course, that my device being made of natural or synthetic rubber, it is entirely possible to produce the same in colors and designs embodying various color effects to harmonize with the color and exterior design and appearance of the tube or container to
70 which it is applied to produce a pleasing and ornamental effect.

While my device as illustrated in the accompanying drawing may be said to be of generally tubular form, it will be understood that I do not
75 limit myself to that precise configuration. So

long as the material of which the device is made is inherently resilient, it may be made in almost any desired form to which it will return by its natural resiliency after the release of deforming pressure. Consequently my device may be made
5 in any number of ornamental shapes to conform to, or harmonize with, the general shape of the container to which it is applied.

I claim as my invention:

1. Dispensing means for tubes and other containers, comprising a hollow member of resilient material having a normally closed discharge outlet, and means within said member adapted to divide its interior into two separate chambers, said means having a normally open aperture
10 providing a relatively restricted passage between said chambers.

2. Dispensing means for tubes and other containers, comprising a hollow resilient member having a normally closed discharge outlet, and resilient means within said member adapted upon application of pressure to divide the interior of said member into two separate chambers, said means having an aperture providing a relatively restricted passage between said chambers when
15 pressure upon said member is released.

3. Dispensing means for tubes and other containers, comprising a hollow resilient member having a normally closed discharge outlet, and resilient apertured restricting means within said member, said restricting means being adapted upon application of pressure to said member to divide its hollow interior into two separate chambers and upon release of pressure to assist said resilient member to resume its original shape and to establish communication between said chambers through said aperture.

4. Dispensing means for tubes and other containers, comprising a hollow member of resilient material having a normally closed discharge outlet, and a resilient apertured partition within said member, the aperture of which is adapted to be closed upon application of pressure to said member.

5. Dispensing means for tubes and other containers, comprising a hollow resilient member having a normally closed discharge slit, said member having also an attaching portion provided with an intake opening adapted to be put into communication with the contents of a container, and resilient means within said member operating as said member is alternately deformed and allowed to resume its normal shape to forcibly move material through said intake opening and to cause it to be expelled through said discharge
55 slit.

6. Dispensing means for tubes and other containers, comprising a hollow resilient member having one end adapted to be put into communication with a container and having at its other end a normally closed discharge slit, and resilient apertured means within said hollow member between its ends, said resilient means being adapted upon the application of pressure to said member to divide its hollow interior into two chambers and upon release of such pressure to establish communication between said chambers through said aperture, whereby as pressure is alternately applied to and released from said member and said resilient means material will be caused to move from said container into said hollow member and to be expelled therefrom through said discharge slit.

7. Dispensing means for tubes and other con- 75

tainers, comprising a hollow resilient member having an intake opening adapted to be put into communication with a container, said member having also a self-closing dispensing slit, resilient
5 means within said member having a relatively restricted aperture therein, said resilient means being collapsible upon the application of pressure to close said aperture and divide the interior of said member into two separate chambers,
10 whereby material in the chamber on one side of said resilient means is expelled through said dispensing slit, and whereby upon release

of pressure the aperture in said resilient means will open and permit movement of material into the evacuated chamber by the suction created therein.

8. Dispensing means for tubes and other containers, comprising a hollow member of resilient material having a normally closed discharge outlet, and a resilient member inserted in said first mentioned member and having an end wall located transversely thereof, said end wall having
10 a normally open aperture therein.

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