

[54] BRUSH WITH MATERIAL SUPPLY

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[51] Int. Cl. A46b 11/02

[58] Field of Search 401/190, 183-185, 401/175; 222/213, 214, 402.1-402.2, 402.3, 402.5, 510, 394

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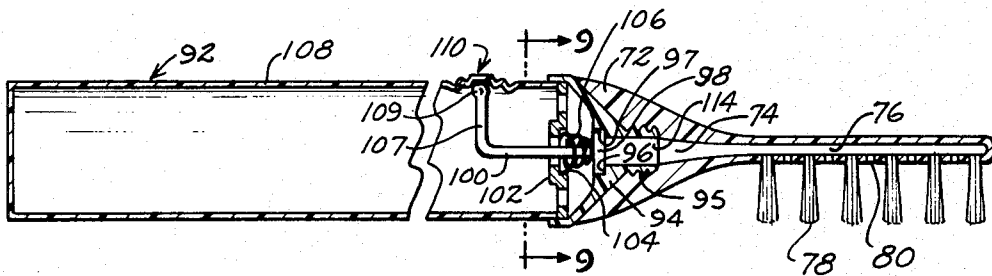
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Attorney, Agent, or Firm—Shanley, O'Neil and Baker

[57] ABSTRACT

A brush including a brush head and a container from which a viscous substance is dispensed through passages in the brush head directly to the region of the bristles. The flow of the substance to the bristles is manually controlled and the brush head forms an extension of the container which functions as a handle. The container can have a knob for advancing a follower to dispense the substance in response to rotation of the knob. The container can also be of the pressurized type where dispensing the substance is controlled by manipulating a valve. The pressurized container has a flexible wall section which permits locating the valve actuator within the pressurized part of the container so there is no danger of leakage at the connection between the brush head and the container. The brush and container can be used as a self-dispensing toothbrush.

7 Claims, 12 Drawing Figures



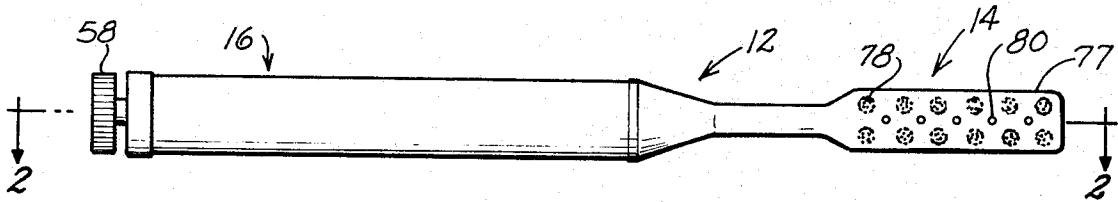


Fig. 1

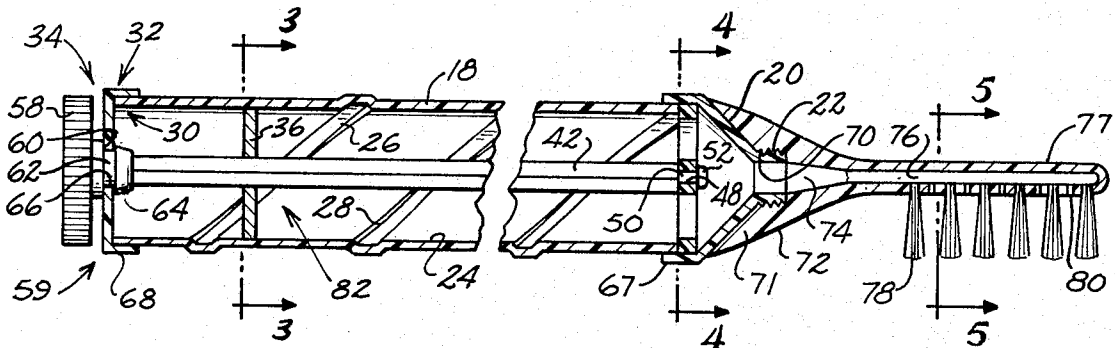


Fig. 2

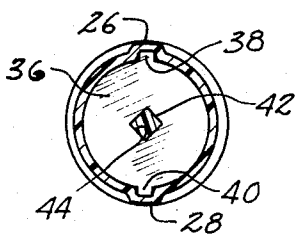


Fig. 3

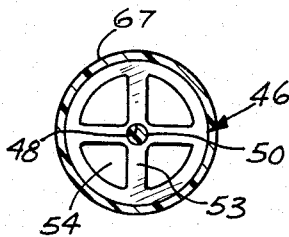


Fig. 4

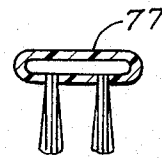


Fig. 5

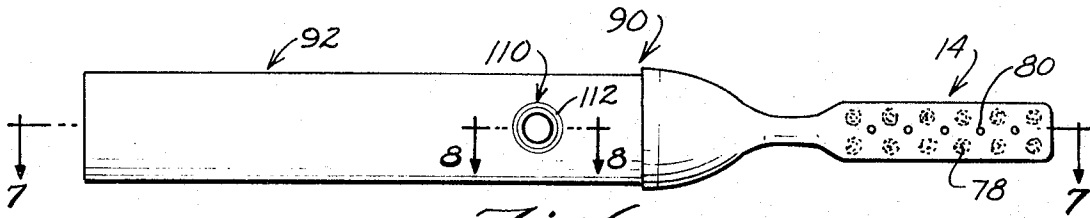


Fig. 6

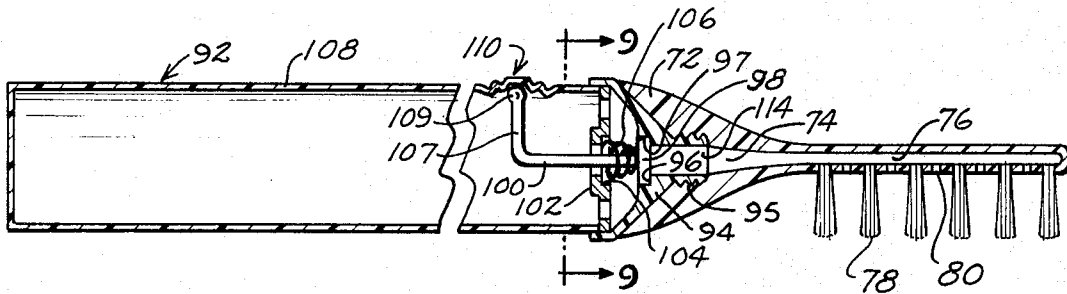


Fig. 7

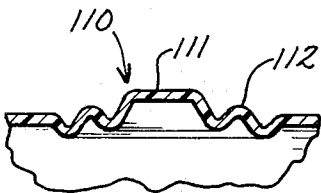


Fig. 8

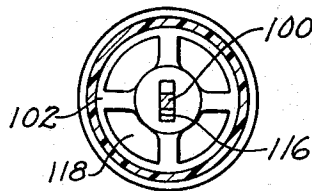


Fig. 9

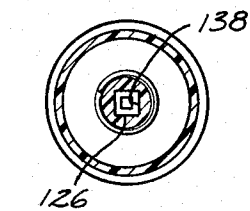


Fig. 12

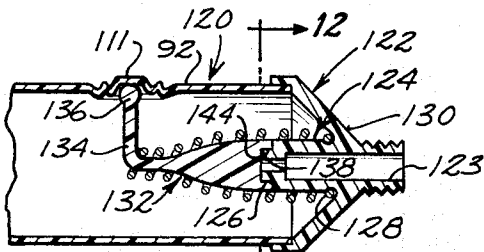


Fig. 10

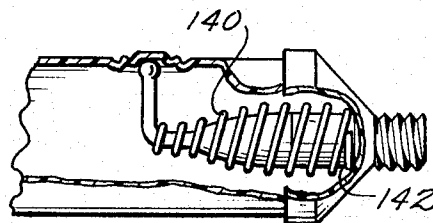


Fig. 11

BRUSH WITH MATERIAL SUPPLY

BACKGROUND OF THE INVENTION

This invention relates to a brush in which paste or other viscous substances are dispensed directly into the region of the brush bristles from a container which forms the brush handle and from which the flow of paste to the bristles can be manually controlled. The invention is particularly useful as a toothbrush, but can be used for other purposes.

While it is known in the prior art to provide toothbrushes having toothpaste containing handles including manually manipulated followers or aerosol dispensers for dispensing dentifrice to the region of the toothbrush bristles, such prior constructions have not been satisfactory because of manufacturing difficulties and leakage and oozing of the dentifrice.

In the case of manually manipulated follower type dispensers which express the toothpaste from the container and through a passage in the neck of the toothbrush to the area of the bristles, prior art constructions have been quite expensive to manufacture and have not proven satisfactory because of the difficulty of controlling the movement of the follower, and in some instances, leakage of the dentifrice around the follower.

In the case of aerosol or pressurized type containers, difficulties have been encountered with the dispensing valve because the valve was located to be operated from outside the container and required some relative movement of the tube or connecting conduit between the container and the toothbrush head to actuate the valve. In such a construction, it was quite difficult to seal the toothbrush head to the container, and as a result, after several operations of the valve, the dentifrice or toothpaste leaked, resulting in wasted dentifrice and soiled hands of the user.

SUMMARY OF THE INVENTION

In accordance with this invention, a first embodiment of a dispensing toothbrush is provided in which a follower, moved by manipulating a knob located on the outside of the toothpaste container, forces controlled amounts of toothpaste or dentifrice from the container and through passages in a toothbrush head to the region of the bristles. Hence, to use the toothbrush, it is merely necessary to wet the bristles, if desired, and then rotate the knob to dispense a desired amount of toothpaste to the bristles. In addition, as the toothpaste is used up during brushing of the teeth, additional small quantities of toothpaste can be accurately dispensed to the region of the bristles. Such dispensing is accomplished without the need for taking the cap off a toothpaste tube, squeezing the normal tube to dispense the toothpaste onto the bristles and then replacing the cap on the tube to seal the remaining contents as is required with conventional toothbrush tubes and containers. In this embodiment of applicant's device dispensing is accomplished quite readily by merely rotating a knob at the end of the hollow handle-container of the toothbrush.

In an additional embodiment of the toothbrush, the toothpaste or dentifrice is in an aerosol or pressurized container. The container has an end which can be threaded to facilitate threading a toothbrush head onto the container in sealed relation to the container. A valve for dispensing the toothpaste from the container is located within the pressurized portion of the con-

tainer and an actuating handle or lever for the valve is also located within the pressurized portion of the container. Operation of the valve is accomplished by pressing a flexible or resilient section in the side wall of the container to move the lever and open a dispensing valve for controlled dispensing of toothpaste from the container. By virtue of this arrangement where the valve as well as its actuator are within the pressurized part of the container, and there is no danger of leaking or wasting toothpaste, as has occurred in the past, where the valve is operated by an actuator outside the container.

These embodiments are economical to manufacture, require a minimum number of parts, and eliminate the inconvenience of dispensing toothpaste directly onto the bristles of a toothbrush from the conventional toothpaste tube.

Correspondingly, it is an object of this invention to provide a toothbrush head adapted to be connected to a toothpaste dispenser having a manual control to control the flow of toothpaste from the dispenser, through passages in the toothbrush head to the toothbrush bristles.

An additional object of the invention is an aerosol or pressurized toothpaste or dentifrice dispenser which can be removably connected to a toothbrush head for expressing controlled amounts of toothpaste through passages in the hollow toothbrush head directly to the toothbrush bristles.

An additional object is a toothbrush head having flow passages which can be connected to a unique toothpaste or dentifrice container with the parts in good sealed relation and in which manual manipulation of either a knob in the case of a follower type container, or a valve in the case of a pressurized container, and which valve is located within the pressurized portion of the container, can be manipulated to dispense toothpaste directly to the region of the bristles from within the toothbrush head.

Another object is a toothbrush arrangement including a hollow toothbrush head and a manually operable dispensing container in which both the toothbrush head and the container are sufficiently inexpensive that either or both can be discarded after the contents of the dispensing container are exhausted.

Numerous other objects, advantages, and features of the invention will become apparent with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a bottom plan view of a first embodiment of the dispensing toothbrush of this invention;

FIG. 2 is an enlarged view in section taken along line 2—2 of FIG. 1;

FIG. 3 is a view in section taken along line 3—3 of FIG. 2;

FIG. 4 is a view in section taken along line 4—4 of FIG. 2;

FIG. 5 is a view in section of a portion of the toothbrush head taken along line 5—5 of FIG. 2;

FIG. 6 is a bottom plan view of a second embodiment of the dispensing toothbrush of this invention;

FIG. 7 is an enlarged view in section taken along line 7—7 of FIG. 6;

FIG. 8 is an enlarged view in section taken along line 8—8 of FIG. 6 and showing the flexible portion of the container;

FIG. 9 is a view in section taken along line 9—9 of FIG. 7;

FIG. 10 is a partial view similar to FIG. 7, with the brushhead removed, and showing another valve arrangement;

FIG. 11 is a partial side view of the arrangement of FIG. 10 with portions of the container cut away; and

FIG. 12 is a view in section taken along line 12—12 of FIG. 10.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1-5 show a first embodiment of a dispensing toothbrush 12 according to the invention. Toothbrush 12 has a toothbrush head 14 removably secured to a hollow dispensing container 16 which form a handle for toothbrush head 14. Container 16 has a tubular body 18 and a dispensing end 20 which is necked in and through which toothpaste or other dentifrice is dispensed from the container. The dispensing opening of the container is defined by an externally threaded nipple or tip 22, the threads on the tip providing for securing container 16 to toothbrush head 14. Body 18 is of uniform diameter along its length and has a length several times its diameter. Formed in the inside surface 24 of body 18 are a pair of diametrically opposed helical grooves or tracks 26 and 28 which extend the length of the body. End 30 of the body is initially open but is closed by a cap like rear closure 32 of a follower-dispensing assembly 34.

Dispensing assembly 34 includes a follower disc 36 having diametrically opposed radially projecting tabs 38 and 40 which engage respectively in the helical tracks 26 and 28. Follower rod 42 is square in section so a nonrotatable connection is formed between follower disc 36 and follower rod 42 where the rod passes through the square opening 44 of the follower disc.

Adjacent end 20 is an apertured disc 46 which is seated at the end of body 18. Disc 46 has a centrally located cylindrical opening 48 which functions as a bearing and receives a reduced diameter cylindrical end 50 of follower rod 42 to maintain the end of the rod centered in body 18. Disc 46 is preferably made from a plastic material with resilient characteristics such that an enlarged head 52 of follower rod 42 can be snapped through opening 48 to mount disc 46 on follower rod 42. Disc 46 has several stabilizing arms 53 defining openings 54 through which toothpaste passes as it is forced toward dispensing opening 22 by follower disc 36.

Secured to follower rod 42 is an enlarged knob 58 which provides for rotating the follower rod from the end 59 of container 16. On the knob is a shoulder 60 which abuts the outside surface of cap 32, and a groove 62 is formed between the shoulder and a tapered cylindrical enlargement 64. Enlargement 64 and groove 62 provide for connecting the follower rod 42 to end cap 32, for rotation relative to the end cap, by inserting the follower rod through the end cap and then snapping the enlarged portion 64 through opening 66 of the end cap.

The tapered or necked in end 20 can be formed separately from body 18, in which instance, end 20 has a short peripheral flange 67 which overlaps an end of the side wall of body 18. End 20 can be adhesively secured to the body by use of a suitable cement or solvent applied to the end of the body or the inside surface of skirt 67.

End cap 32 also has a skirt or flange 68 which is bonded or adhesively secured to end 59 of the body.

Toothbrush head 14 is configured to form a continuation of container 16 to present the external appearance of a one piece toothbrush unit. Toothbrush head 14 is actually screw threaded onto the neck end of container 16 by engagement of threads 70 at the interior of base 72 of the toothbrush head with the threads on the outside of the tubular tip 22 of the container.

The body 72 has a flared end 71 which conforms to the tapered external configuration of end 20. In addition, there is a transverse shoulder at the inner end of the threads 70 which abuts the end of tip 22 and forms a tight seal which prevents leakage between tip 22 and body 72.

An elongated passage 74 connects the tubular tip 22 to a chamber 76 within the end portion or bristle supporting body 77 of the toothbrush head. A plurality of toothbrush bristles 78 project from the head and openings 80 are formed in the head adjacent the toothbrush bristles so that toothpaste or dentifrice dispensed from container 16 will flow through chamber 76 to the region of the bristles 78. Openings 80 can be formed in the spaces between bristles 78 or alternatively, the bristles of each tuft can surround an opening at the base of the tuft.

With container 16 filled with toothpaste or other viscous dentifrice, and with toothbrush head 14 connected to the container as shown at FIGS. 1 and 2 brushing one's teeth proceeds as follows. First, knob 58 is rotated thereby rotating follower disc 36 to which it is keyed. Such rotation of the follower disc causes toothpaste in chamber 82 (to the right of disc 36 as seen at FIG. 2) to be forced toward neck 20. Such movement of disc 36 occurs because of the engagement of its lugs 38 and 40 with the grooves 26 and 28 formed in the inside surface of the container wall. Since the thread angle of the grooves 26 and 28 is for example, on the order of 60°-75°, only slight twisting of knob 58 is required to advance follower disc 36 to force toothpaste from container 16 through passage 74, chamber 76, and openings 80 to the region of the bristles. Openings 54 in centering disc 46 allow flow of the toothpaste to nipple 22. During such rotation of knob 58 and follower rod 42, separation of the follower rod from the container is prevented by the enlargement 64 which cooperates with the opening 66 in end cap 32, the end cap being secured to the outside surface of the body. If more toothpaste is needed during brushing, knob 58 can be further rotated while the toothbrush head is in the users mouth.

When the supply of dentifrice within the container 16 becomes exhausted, toothbrush head 14 is merely unscrewed from the container and a new container is threaded into the toothbrush head. The old container can then be discarded. It is also contemplated that a toothbrush head can be supplied with each container and under these circumstances the old toothbrush head will simply be discarded when the container is empty.

Advantageously, the several parts of container 16 and toothbrush head 14 are formed from plastic material which is sanitary as well as inexpensive. Use of a plastic material simplifies bonding end cap 32 as well as end 20 to the body 18, and simplifies forming the body as well as filling the container with the dentifrice.

FIGS. 6-9 show a second embodiment of the dispensing toothbrush of this invention. Dispensing toothbrush

90 has a toothbrush head 14 identical to the head previously described. In addition, there is a toothpaste container 92 which is elongated and which is threaded into base 72 of toothbrush head 14 as shown at FIG. 7, and which seals against the head in the manner previously described.

Container 92 is of the aerosol or pressurized type for dispensing toothpaste to the bristles of the toothbrush head through passage 74 and chamber 76 to bristles 78 via openings 80.

Container 92 has a thick tapered head 94 the inside of which is counterbored to provide a valve seat 96 at the end of a side wall 97. Seated against valve seat 96 is a valve disc 98 which is fixed to the inner end of an L-shaped valve actuator rod 100. Valve disc 98 has a diameter slightly smaller than the inside of the side wall to permit toothpaste to flow when the disc 98 is tilted. Extending across the container is a valve retainer plate 102 having a recessed center portion which forms a spring seat 104 for a spring 106 which surrounds stem 100 and urges valve disc 98 into engagement with valve seat 96. By virtue of the pressure within container 92, and the action of spring 106, valve disc 98 is normally maintained in sealed engagement with its valve seat 96. Stem 100 has an offset end 107 which projects to a location closely adjacent the sidewall 108 of container 92, where the stem terminates at a smooth tip 109. Formed in the side wall is a resilient or flexible portion 110, and the tip of arm 107 of the stem extends closely adjacent this flexible portion of the side wall. The flexible portion takes the form of a button 111 surrounded by circular, bellows type indentations 112 which permit button 111 to be manually pressed and moved radially with ease, even though the side wall 108 is relatively thick and the container is pressurized. Normally, tip 109 of stem 100 is closely adjacent to the inside of button 111 so depressing the button causes stem 100, and valve disc 98 which is secured to the stem, to tilt on its seat 96 with the result that the valve opens and toothpaste or dentifrice is forced through the dispensing opening 114 of the container so long as the valve is unseated. When button 111 is released, the action of spring 106, and the pressure within the container, return disc 98 to its sealed position with seat 96 and dispensing ceases.

As shown at FIG. 9, stem 100 can be square or rectangular, and the opening in the retainer plate 102 through which the stem extends can take the form of a slot 116 with side edges closely adjacent the sides of the rectangular stem. These side edges function as guides to prevent stem 100 from rotating and consequently maintain tip 109 aligned with the button 111. If desired, retainer plate 102 can also have additional openings 118 to provide for free flow of toothpaste from the container to the region of the valve. Head 94 can be bonded or crimped to side wall 108 and spring retainer 102 can be secured at the joint between head 94 and side wall 108, as shown at FIG. 7.

A distinct advantage of the arrangement of FIG. 7 is that there are no external parts in or around head 94 or its threaded tip 95 which can interfere with sealing the neck to the base 72 of the toothbrush head. In addition, there are no relatively movable valve parts at the connection between neck 94 and body 72 of the toothbrush head. This permits the toothbrush head to be rigidly supported by the container. Since all the valve parts are located within the pressurized portion of con-

tainer 92 there is no danger whatever of any leakage of toothpaste from the container during dispensing, as has been the case with the prior art handle type toothbrush dispensers.

Body 92 can be formed from sheet metal or a stiff plastic material. In either instance, the bellows indentations provide sufficient flexibility for button 111 to be readily moved to actuate the valve. The pressure of the pressurizing medium in the container functions to return the button 111 to the position shown at FIG. 8 as soon as it is released. Preferably, valve disc 98, stem 100, spring retainer 102 and head 94 are also formed from a plastic material. This permits formation of these parts by the simple technique of molding or casting.

To use toothbrush 90, it is merely necessary to press button 111 which actuates the valve in the manner previously described to dispense toothpaste or other dentifrice to the bristles 78 of the toothbrush head 14. Because of the construction of dispensing toothbrush 90 there is no danger of leakage or wasted dentifrice, and when container 92 is empty, the old container is removed, is replaced by a full container, and the toothbrush head 14 can continue to be used. Alternatively, the entire unit may be discarded in which instance a new toothbrush head 14 will be supplied with a full container of the dentifrice.

Another embodiment of a container similar to that of FIGS. 6-9 but in which a different form of dispensing control valve is used will now be described with reference to FIGS. 10-12. As shown at FIG. 10, container 120 includes a body 92 with a movable button 111 like that of container 90. Container 120 has a container head 122 with an external configuration identical to that of head 94 so toothbrush head 14 can be threaded onto the container head in sealed relation to the container head and dispensing opening 123. The interior of head 122 is however, different from that of head 94 and includes a centrally located nipple 124 which extends into the interior of container 120. The nipple 124 is cylindrical but has a smaller size square tip 126 at its end. Nipple 124 is formed integrally with container head 122 and has an undercut or groove 128 adjacent its juncture with the conical end 130.

Cooperating with square tip 126 is a valve actuator 132. Actuator 132 has an offset end 134 which terminates at a smoothly rounded tip 136 adjacent button 111. The body of actuator 132 is generally conical externally and converges in a direction toward offset end 134. Formed in the end of the body is a square opening 138 which receives the square tip 126 of nipple 124. Actuator 132 is held in the position of FIG. 10 by a helically wound conical coil spring 140 which encircles and engages both the actuator body and nipple 124. The end convolution 142 at the larger end of the spring has a smaller diameter than the adjacent convolutions so convolution 142 can seat in groove 128 to hold the spring or nipple 124. The convolutions of spring 140 closely embrace the exterior surface of the body 132, and the spring is under slight tension when its end convolution 142 is seated in groove 128 so actuator 132 is normally pulled to the valve closed position shown at FIGS. 10 and 11.

When button 111 is pressed actuator 132 is tilted so it pivots away from the rectangular end face 144 of tip 126. This provides a space through which the toothpaste or dentifrice in container 120 is forced into dispensing opening 146 by the pressurized gas in the con-

tainer. When button 111 is released, spring 140 pulls actuator 132 to the position of FIGS. 10 and 11 in which the actuator completely covers the square tip 126 to close dispensing opening 146 against further flow of toothpaste from the container. The square tip 126 cooperates with the square opening 138 of actuator 132 to prevent the actuator from rotating and correspondingly, to prevent offset end 134 and tip 136 from rotating to a position out of alignment with button 111. With toothbrush head 14 mounted on container 120 in the manner shown at FIG. 7, the dispensed toothpaste will flow to the toothbrush bristles in the manner previously described.

In view of the foregoing explanation it is apparent that applicant has provided several unique embodiments of a toothbrush each including a handle which functions as a container and from which dentifrice or toothpaste is dispensed in a controlled manner directly to the region of the bristles of the toothbrush.

While the preferred embodiments have been described for use as toothbrushes it is to be understood that these embodiments can be used for other purposes, such as shoe polish, paint, and cleaning or coating compounds for various materials, that the shape of the brush can be changed to suit the use of the device, and that numerous other changes can be made in the construction of these brushes without departing from the scope of the invention as specified herein and set forth in the appended claims.

What is claimed is:

1. A pressurized container for dispensing a viscous material through passages of a brush head to the region of bristles of the head comprising, in combination
 wall means defining a sealed container having means defining a dispensing opening;
 connector means for securing a brush head to the container in sealed relation to the dispensing opening;
 a valve between the dispensing opening and a pressurized region of the container, the valve normally closing the dispensing opening;
 a flexible section in a defined region of the wall means; and
 an actuator operably associated with said valve and extending to a location adjacent the flexible wall section,
 the actuator being movable in response to manual movement of the resilient wall section to open the valve to permit controlled dispensing of material from the container to the dispensing opening and the bristles of a brush head secured to the container,

the resilient wall section including bellows means in the resilient wall section defining a manually operable button.

2. A pressurized container according to claim 1 wherein the valve actuator is rigid with the valve and has an L-shaped stem so that movement of the actuator by depressing the flexible wall section tilts the valve to an open position.
3. A pressurized container according to claim 2 which further includes means adjacent the valve stem and engaging the stem to prevent rotation of the stem with respect to the flexible wall section.
4. A pressurized container according to claim 1 wherein the pressure within the container presses the valve toward its normally closed position; and spring means engage the valve and urge the valve toward its normally closed position.
5. A pressurized container according to claim 1 wherein said actuator includes a stem rigid with a moveable element of the valve; a spring encircles the stem to urge the valve toward its closed position; and the spring permits tilting of the valve element with respect to its seat.
6. A pressurized container according to claim 1 wherein the pressurized container is the handle of a toothbrush; the brush head is a toothbrush head; a support stem projects from the toothbrush head, the support stem having passage means connecting an inlet at one end of the stem to an outlet adjacent bristles of the toothbrush head; means adjacent the inlet and cooperating with the connector means for removably securing the toothbrush head to the container.
7. A pressurized container according to claim 6 wherein the means adjacent the inlet comprises an internally threaded end of the stem; the means adjacent the dispensing outlet comprises an externally threaded nipple defining the dispensing opening; said nipple sealing against the stem to prevent leakage between the dispensing opening and inlet of the stem.

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