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LIQUID DISPENSING BRUSH AND VALVE STRUCTURE THEREFOR

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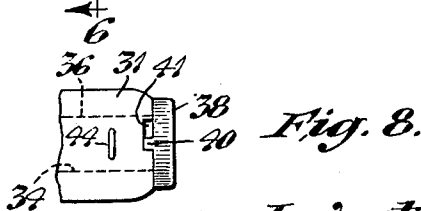
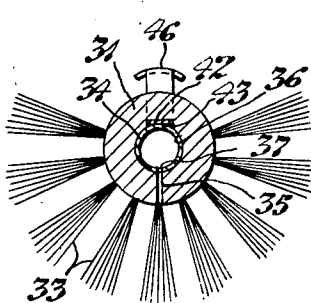
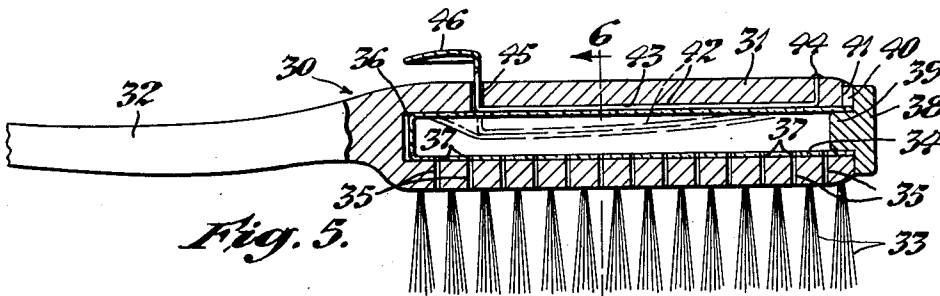
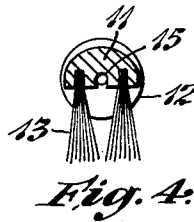
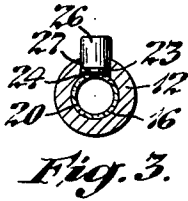
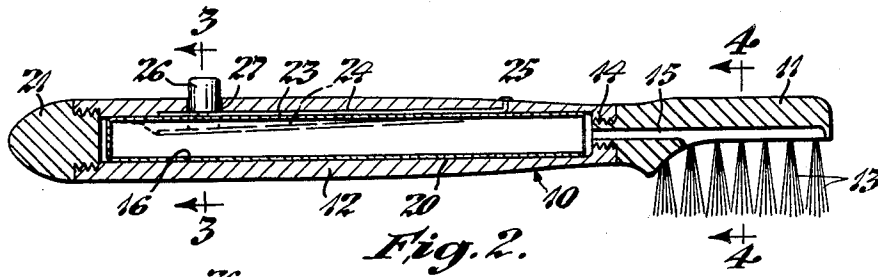
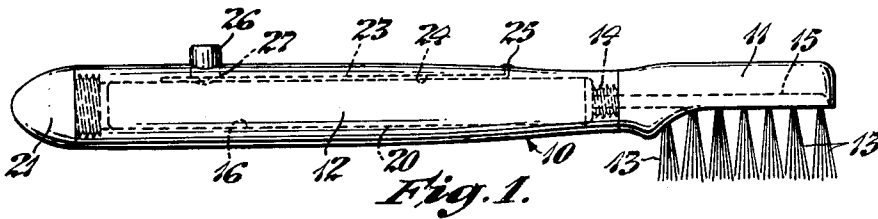


Fig. 6.

Fig. 7.

Fig. 8.

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LIQUID DISPENSING BRUSH AND VALVE STRUCTURE THEREFOR

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2 Claims. (Cl. 15-136)

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This invention relates to brushes, and particularly to brushes of the character having means embodied therein for dispensing liquid from a reservoir onto the bristles thereof.

Brushes of various types have been proposed which have reservoirs for containing a supply of scalp-treating liquid or dentifrice, and manually operable means for forcing the same from reservoir onto the bristles of the brush. In such prior devices, the treating liquid is sometimes contained within a collapsible tube, and is forced from the tube into a passage leading to the brush bristles by pressure-applying means which collapses the tube, the tube being removed from the brush when it is empty and replaced by a full tube. In other devices the liquid is poured into a reservoir of the brush and fed either by gravity or by manually applied pressure through a passage leading to the bristles. Such liquid dispensing brushes have several disadvantages, and for this reason have not been successfully applied to use. For example, a collapsible tube is unsuitable for use in dispensing a liquid, since the liquid is quite apt to flow uninterruptedly from the tube and thus become wasted, and the control of the flow therefrom involves complicated devices, which not only are unreliable but are expensive and add greatly to the cost of the brush. When the liquid is merely contained in a reservoir of the brush it must be poured thereinto, and thus spilling is possible and the hands and garments of the user are apt to become soiled.

It is an important object of this invention to provide a brush of the liquid dispensing type in which a flexible refill cartridge is employed for containing a supply of treating liquid, the cartridge being insertable into a bore or receptacle of the brush and having at least one opening from which the liquid can flow from the cartridge to the bristles of the brush, by way of a passage in the brush, the cartridge being compressed by manually operable means to cause the liquid to be forced therefrom to the bristles and operative, when released, to create suction, tending to retain the liquid therein so as to prevent leakage of the liquid.

Another object is to provide a brush, of the character referred to, in which the cartridge may be made and sold as a refill for the brush, the cartridge being readily flexible yet capable of retaining its shape.

Another object is to provide, in a brush of the type specified, a simple yet highly effective means for compressing the cartridge to force liquid therefrom, this means being operated manually

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by a finger of the hand in which the brush is held.

Another object is to provide valve means for controlling the flow of liquid from the cartridge.

Another object is to provide improvements in liquid dispensing devices which may be embodied in brushes for hair, teeth, shoes, etc., for dispensing various substances of a liquid or semi-liquid nature.

A further object is to provide liquid dispensing means for brushes which is simple in construction and economical to manufacture, and one which is highly efficient in performing its intended function.

Further objects are set forth in the following specification which describes two preferred embodiments of the invention, by way of example, as illustrated by the accompanying drawing. In the drawing:

Fig. 1 is a side view of a toothbrush embodying the present improved liquid dispensing means;

Fig. 2 is a longitudinal sectional view of the same;

Fig. 3 is a cross-sectional view, taken on line 3-3 of Fig. 2;

Fig. 4 is a cross-sectional view, taken on line 4-4 of Fig. 2;

Fig. 5 is a part-sectional side view of a hairbrush having a liquid dispensing means of modified construction;

Fig. 6 is a cross-sectional view, taken on line 6-6 of Fig. 5;

Fig. 7 is a view similar to Fig. 6, but showing the liquid cartridge rotated to a position to disrupt the flow of liquid to the brush bristles; and,

Fig. 8 is a fragmentary plan view of the forward end of the brush shown in Fig. 5.

Referring first to Figs. 1 to 4 of the drawing, the brush shown in these views is of the dental type for brushing teeth, although it might be employed for applying liquid to various objects. This brush has a body 10 which comprises a head 11 and a handle 12, bristles 13 being carried by the head. The head 11 is preferably, although not essentially, detachably connected to the handle 12, and for this purpose is provided with a reduced threaded extension 14 which is screwed into a tapped hole in the handle. The head 11 has an axial passage 15 which extends through the extension 14 and which leads to the exterior of the head at a location between rows of the bristles 13, see Figs. 2 and 4.

The handle 12 is tubular, having an axial bore 16 providing a receptacle for receiving a flexible transversely compressible, cylindrical cartridge

20 having an open end disposed adjacent the inner end of the passage 15. The cartridge 20, which is adapted to contain a supply of liquid dentifrice, or other liquid, is preferably made from a readily flexible plastic material capable of maintaining its shape. The cartridge may be made and sold as a refill for the brush, and its open end may be normally closed by a readily removable cap or closure tab which can be removed prior to insertion of the cartridge into the receptacle 16. The rear open end of the handle 12 is closed by a screw cap 21, after the cartridge has been inserted into the handle.

Means are provided for compressing the cartridge 20 in a transverse direction so as to force liquid dentifrice from the open end of the cartridge and through the passage 15 onto the bristles 13. This means comprises a resilient, flexible strip or bar 23 which is disposed in a longitudinal groove 24 within the receptacle 16, and which has one end secured therewithin, as shown at 25. The other end of the operating bar 23 carries a finger-piece 26 which projects outwardly through an aperture 27 in the wall of the handle 12.

By depressing the finger-piece 26, the bar 23 is flexed inwardly toward the axis of the handle 12 so as to flex and compress the cartridge 20. Liquid in the cartridge is thus forced therefrom through the passage to be deposited on the bristles 13, the degree of compression determining the amount of liquid dispensed from the cartridge. When the finger-piece 26 is released, the operating bar 23 springs back to its original unflexed position, thereby permitting the cartridge to assume its unflexed condition. In this manner a slight vacuum is created within the cartridge 20, and this tends to retain the liquid therein to prevent leakage.

After all the liquid has been dispensed from the cartridge 20 the cap 21 is removed, and the empty cartridge is slid out from the handle and replaced by a full cartridge, or if preferred the empty cartridge is refilled and reinserted into the handle 12.

Referring now to Figs. 5 to 8 of the drawing, the present invention provides a hair-brush 30 which has a head 31 and a handle 32. The head 31 is provided with several rows of bristles 33, and has an axial bore 34 providing a receptacle. A plurality of transversely extending passages 35 communicate with the bore 34 and lead to the exterior of the under side of the head 31 between adjacent rows of the bristles 33.

Adapted to be slid into the bore 34 is a flexible, resilient cylindrical cartridge 36 which has a close fit therein. The cartridge 36 has a series of openings 37 in its wall, the openings being adapted to align with the passages 35 to permit hair oil, or other liquid, contained within the cartridge, to flow from the latter onto the bristles 33. The cartridge 36 has an inner closed end, and its outer end is adapted to be closed by a knob-like cap 38 which is provided with a reduced end 39 onto which the open end of the cartridge is stretched to provide a leak-proof connection.

The cap 38 abuts the end of the head 31 to limit sliding movement of the cartridge into the bore 34, and is employed as a means for rotating the cartridge 36 from the position shown in Fig. 6, wherein the openings 37 align with the passages 35 to permit flow of liquid from the cartridge onto the bristles, to the position illustrated in Fig. 7, wherein the openings and pas-

sages are out of registry to prevent such flow of the liquid. The cap 38 has a lug 40 on its inner face which is disposed in a slot 41 in the end of the head 31, the lug engaging the opposite ends of the slot to limit the rotation of the cartridge in either direction. The cartridge 36 may be made and sold as a filled container, the liquid being retained in the cartridge prior to its insertion in the head 31 by a readily removable strip normally covering the openings 37.

As in the device shown in Figs. 1 to 4, the liquid is dispensed from the cartridge 36 in response to pressure exerted thereagainst which causes compression of the cartridge. The means for compressing the cartridge 36 consists of a flexible strip or bar 42 which is disposed in a longitudinal groove 43 within the bore 34 and having one end secured to the head 31, as indicated at 44. The other end of the operating bar 42 is bent upwardly and projects outwardly through an aperture 45, the extremity of the bent portion being provided with a finger-piece 46 which facilitates depression of the bar 42.

To force liquid from the cartridge 36 onto the bristles 33, the cartridge is rotated from the position shown in Fig. 7 to that illustrated in Figs. 5 and 6. The finger-piece 46 is then forced downwardly to cause flexing of the operating bar 42, which then acts to compress the cartridge 36 in the manner indicated by broken lines in Fig. 5, whereupon liquid is forced through the openings 37 and passages 35, which serve as a valve means, and onto the bristles 33. When the bar 42 is released, suction created in the cartridge 36 serves to retain the remainder of the liquid therein, but to positively guard against leakage of the liquid the cartridge is rotated to the position shown in Fig. 7 to close the valve means.

While I have herein shown and described the improved brush as embodied in two preferred forms of construction, by way of example, it will be understood that various modifications might be made in the construction without departing from the spirit of the invention. Therefore, without limiting myself in this respect, I claim:

1. A brush, comprising: a brush body having a head at one end and a handle at the other end, said head having a bore therein and passage means leading from said bore to the exterior of the head; bristles on said head; a flexible refill cartridge disposed in said bore and having aperture means communicating with said passage means, said cartridge being adapted to contain a liquid; and having an open end closed by a cap, said cap being disposed exteriorly of said head and adapted to rotate said cartridge to a first position to align its aperture means with said passage means and to a second position to disalign said aperture means and passage means; and manually operable flexible means on said head engageable with said cartridge and adapted to compress the same to force liquid therefrom and through said passage means onto said bristles.

2. A brush as defined in claim 1, including stop means for limiting rotation of said cartridge in either direction, said stop means comprising a lug on said cap disposed in a slot in the end of said head, said lug being engageable with the ends of said slot.

AGNES F. BANKS.

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