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TOOTHBRUSH HANDLE FOR INTERCONNECTING A BRISTLED
HEAD AND A PRESSURIZED TOOTHPASTE CONTAINER
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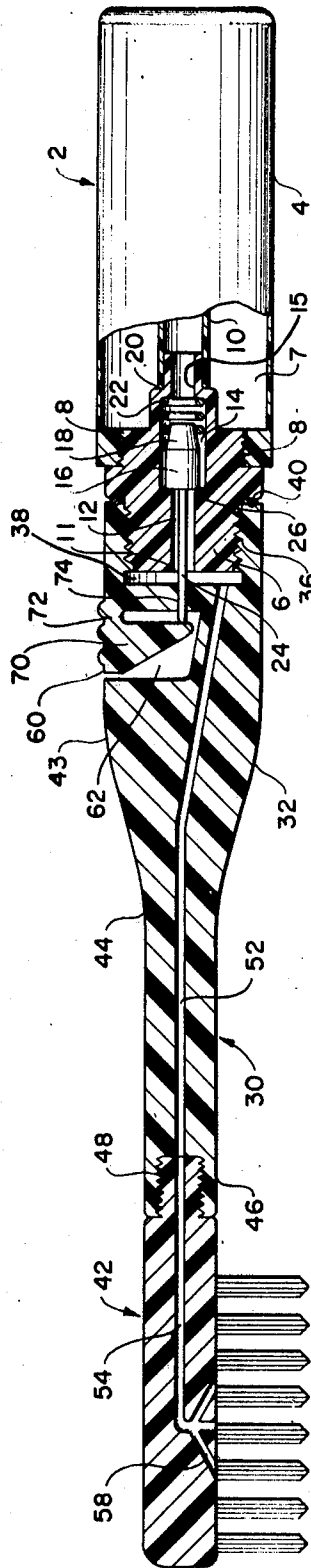


FIG. 1

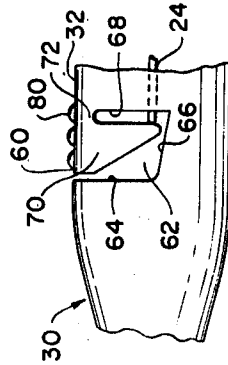


FIG. 3

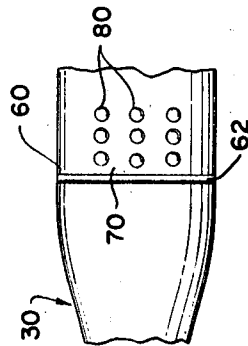


FIG. 2

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**TOOTHBRUSH HANDLE FOR INTERCONNECTING
A BRISTLED HEAD AND A PRESSURIZED
TOOTHPASTE CONTAINER**

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7 Claims

ABSTRACT OF THE DISCLOSURE

A toothbrush handle for connecting a pressurized container of toothpaste with a bristled toothbrush head, and comprising an elongated, hand-holdable component provided with a longitudinally extending supply passage and a valve control element. The supply passage communicates adjacent one end with the discharge port of the pressurized toothpaste container and adjacent the other end with a paste distribution passage in the brushing head. The valve control element is operatively connected with and controls a paste discharge valve on the pressurized container so as to permit selective delivery of paste to the brushing head.

BACKGROUND OF THE INVENTION

The present invention relates generally to toothbrush structure and more particularly to a toothbrush handle for interconnecting and controlling the flow of toothpaste from a pressurized toothpaste container to a bristle-equipped brushing head having a paste distribution passage leading to the bristle area.

It is known in the prior art to provide toothbrushes having hollow handles and means associated therewith for expressing toothpaste through the handle to the brushing head. Typically, the handle is loaded with a supply of toothpaste which is forced out to the bristle area by manually moving the piston with a push rod or screw. The present invention constitutes an improvement over the prior art by providing a handle that eliminates the need for manually forcing or hand feeding the toothpaste into the bristle area of the brushing head. Instead, toothpaste is automatically supplied to the bristle area by merely pressing a button on the handle, and the provision of such improvement is, among others, an object of the present invention.

Another object of this invention is to provide a toothbrush handle for mechanically interconnecting a pressurized toothpaste container with a bristle-equipped toothbrush head and for flow connecting the same so that toothpaste can be delivered to the brushing head under the selective control of the user.

Still another object is that of providing a toothbrush handle that can be quickly and easily connected with and disconnected from a brushing head so as to enable interchange thereof, and that can be similarly connected and disconnected from a pressurized toothpaste container so that one such container can be replaced with another when paste supply, or user's taste, requires change.

Yet another object is in the provision of an improved toothbrush handle of the character described in which proper alignment and registration of the supply passage in the handle with the toothpaste discharge port of the pressurized container occurs automatically upon interconnection of the handle and container, and in which the orientation of the brushing head relative to the handle and valve-control element provided thereby can be changed readily to satisfy the convenience, habit pattern or muscular idiosyncrasies of any particular user.

A further object is to provide an improved handle of the type set forth in which the valve control element is

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unobtrusive, is easy to manipulate with one or another of the digits of the hand, is operatively connected with the valve of such container automatically when the handle and a container are assembled, and is integral with the handle.

Still a further object of the invention is that of providing an inexpensive and easily manufacturable toothbrush handle design for carrying out the above objectives and advantages, others of which will become apparent as the specification develops.

SUMMARY OF THE INVENTION

The foregoing objects as well as others are achieved by a toothbrush handle consisting generally of an elongated component having a supply passage extending therethrough and being joinable at one end with a bristle-equipped head having a paste distribution passage opening at one end into the bristle area. At the other end the elongated handle component is joinable with a pressurized container having a discharge port and a valve for controlling the discharge of toothpaste therefrom. A valve control element is provided by the elongated handle component and operatively connects with the pressurized container valve. The handle supply passage extends longitudinally therethrough and it communicates at one end with the discharge port of the pressurized container and at its other end with the paste distribution passage of the toothbrush head.

According to one aspect of the invention, the valve control element is made an integral part of the elongated handle component and is hinged thereto by a narrow neck. A slot in which the valve control element is positioned extends transversely across the entire width of the handle member so that the manufacturing process by which it is fabricated may be accomplished inexpensively and conveniently.

BRIEF DESCRIPTION OF THE DRAWING

A more detailed understanding of the invention may be had by reading the following detailed description in conjunction with the attached drawing wherein:

FIG. 1 is an elevational view in partial cross-section showing the detailed internal construction of a preferred embodiment of the toothbrush handle in association with a brushing head or pressurized container;

FIG. 2 is a broken top plan view of a portion of the toothbrush handle shown in FIG. 1; and

FIG. 3 is a broken elevational view of that portion of the toothbrush handle shown in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1, reference numeral 2 designates a pressurized container filled with toothpaste. A cylindrical shell 4 and closure plug 6 define an enclosed cavity or pressurized space 7 within which the toothpaste is stored under pressure. In the embodiment illustrated, the plug 6 is attached to shell 4 by complementary threads 8; however, other attachment schemes may be used. A tube 10 within the container is adopted to deliver the contents thereof to a discharge port 11 defined at the outer end of a pair of serially connected passages 12 and 14 formed in the plug 6, the latter of which is of greater cross-section and forms a valve chamber. The tube 10 telescopes onto a neck or projection 15 provided at the inner end of the plug 6 and communicating with the valve chamber 14.

Located in the valve chamber 14 is a cylindrical valve element 16 having a frusto-conical surface 18 at one end. Interposed between the frusto-conical surface 18 of the valve and an abutment 20 provided by the plug 6 is spring 22. Generally concentric with and extending

longitudinally away from valve 16 is a valve stem 24. In its closed position the valve 16 is biased by the spring 22 into sealing engagement with an abutment or valve seat 26, but when a longitudinal force is exerted against the valve stem 24, valve 16 is moved out of sealing engagement with the seat 26 and toothpaste will flow outwardly through the chamber 14 around the valve 16 and out through discharge port 11.

Toothbrush handle 30 consists of an elongated component 32 having a bore or cavity extending longitudinally inward and provided along substantially the entire length thereof with threads 36 and terminating at its inner end in an annular chamber or manifold 38. At its outer end, the plug 36 is threaded and it screws into and engages the threads 36 of the plug 6. An O-ring 40 complements the seal provided by the screw threads so that container 2 and toothbrush handle 32 are sealed together.

The end of the handle 30 connected to container 2 has dimensions comparable to those of the container and sized to fit comfortably into the hand of a user. However, the other end of the handle 30 must connect with a toothbrush head 42 which is necessarily small enough to fit comfortably into a person's mouth. To achieve the transition between these two dimensions, handle 30 necks down between points 43 and 44 therealong to form a small end 46 having a threaded cavity 48 into which the head 42 is screwed.

The receiving cavity or manifold 38 formed by the end surface of plug 6 and facing surface of the handle 30 is connected with a supply passage 52 extending longitudinally through the handle from the manifold to the small end 46. A distribution passage 54 formed in the head 42 is aligned with and communicates with the supply passage 52 so as to receive toothpaste therefrom and supply the same to a bristle area 56 of the head, as through a plurality of branch passages 58.

A valve control element 60 is provided along the handle 30 integrally therewith, and it is defined by a transverse slot 62 formed by surfaces 64, 66, and 68. The valve element 60 includes a depressible button member 70 integrally connected to the elongated handle component 32 by thin neck 72.

A cylindrical valve stem passage 74 extends from receiving cavity 38 to slot 62, and the valve stem 24 projects slidably through the passage 74 to make contact with button member 70, as shown in both FIGS. 1 and 3.

The valve 16 is normally closed, and to open the same button member 70 is pressed inwardly in a direction transverse to the longitudinal axis of the handle. The neck 72 acts as a hinge and causes the button to swing in a counterclockwise direction as viewed in FIGS. 1 and 3, thereby displacing the stem 24 inwardly, or toward the right which forces the valve 16 from the seat 26 and toothpaste will flow through the passage 12 and out of the discharge port 11, through the receiving cavity 38, supply passage 52 and distribution passage 54 into the bristle area 56.

To stop the flow of toothpaste, force is removed from button member 70 whereupon the spring 22 forces the valve 16 to seal against the abutment seat 26. Valve stem 24 in returning to its original position forces button member 70 back to its original position. However, the natural resilience of the material from which the handle 30 is made causes the hinge neck 72 to act as a spring as well as a hinge and complements the action of the spring 22 in so far respects the button member 70 returning to its original position.

Variant forms of valve control elements are possible such as, for example, an independent piece inserted into slot 62 and movable longitudinally or transversely to displace the stem 24. However, the embodiment shown in the drawing has the advantage of being inexpensive since it may be formed in the same molding operation with the rest of the handle. In this connection, it is advantageous that the slot 62 extend completely through the

handle 30, as shown in FIGS. 2 and 3 so that simple dies may be devised and used.

It is also important that the button member 70 have sufficient clearance in slot 60 to allow hinging motion to take place. To this end, the rectangular cross-section of the groove 62 and the somewhat triangular cross-section of button member 70 were especially advantageous. The upper surface of button member 70 may be roughened (as shown by protuberances 80) to enhance the traction between the button and the user's finger.

The handle 30 may be formed of many different materials, and advantageously a synthetic plastic material (a thermoplastic such as polystyrene or polyethylene) may be used so that the handle can be fabricated in an injection molding operation. Other materials can be used, but in any case the material must be sufficiently rigid in the convenient cross-sections shown so that the head 42 can be manipulated in the usual manner to brush one's teeth. At the same time, however, the material must be sufficiently flexible at the hinge 72 so that the button 70 can be depressed through a great number of cycles without significant fatigue, thereby enabling the handle to have a long life.

The head 42 is readily removed from the handle 30 so that interchange of heads is afforded, and it will be observed that the head 42 can be rotated to different angular positions relative to the handle 30 and push button 70 thereof without disturbing the communication of the supply passage 52 with the distribution passage 54 so that the bristles 56 may be located relative to the button 70 in an orientation accommodating the preferences of any particular user of the toothbrush assembly. In this reference, it may be convenient for some users to displace the button 70 with their thumb while another user may prefer to employ the index finger or some other finger digit of the hand to depress the button.

Containers 2 are readily replaced on the handle 30 simply by unscrewing the handle from the plug 6 of one container and threading it onto the plug of another container. It will be observed that an automatic communication is established between the supply passage 52 and discharge port 11 of any such container because of the intervening agency of the manifold 38. Since toothpaste is usually present within the manifold 38, it is in contact with valve stem 24 and serves as a lubricant to facilitate longitudinal displacements thereof between the open and closed positions of the valve element 16 upon displacement of the button 70.

What is claimed is:

1. A toothbrush handle joinable at one end with a bristle-equipped brushing head having a paste distribution passage extending therethrough and opening at one end into the bristle area of such head for supplying toothpaste thereto and joinable at its other end with a pressurized container having a discharge port and a valve for controlling the discharge of toothpaste therefrom, said handle being an elongated component adapted to be hand held and being provided with a longitudinally extending supply passage communicable adjacent one end thereof with such discharge port and adjacent its other end with such paste distribution passage, and said handle having a valve control element for operative connection with such valve and being movable between valve opening and valve closing positions so as to control the flow of toothpaste from such discharge port, said valve control element being movable in a direction substantially transverse to the longitudinal axis of said elongated component and comprising a button member hinged to said elongated component so as to impart limited longitudinal components to such substantially transverse movement, thereby enabling said button member to enforce displacement on such valve in a direction substantially parallel to the longitudinal axis of said elongated component when said button member is depressed in a direction substantially transverse thereto.

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2. The toothbrush handle of claim 1 wherein said elongated component is provided with a transverse slot extending therethrough which receives said button member therein.

3. The toothbrush handle of claim 2 wherein said transverse slot has a substantially rectangularly shaped cross-sectional profile and said button member has a substantially triangularly shaped cross-sectional profile.

4. The toothbrush handle of claim 1 wherein said button member and said elongated component are integrally connected by a narrow flexible neck defining the aforesaid hinging of said button member to said elongated component.

5. A toothbrush handle joinable at one end with a bristle-equipped brushing head having a paste distribution passage extending therethrough and opening at one end into the bristle area of such head for supplying toothpaste thereto and joinable at its other end with a pressurized container having a discharge port and a valve for controlling the discharge of toothpaste therefrom, said handle being an elongated component adapted to be hand held and being provided with a longitudinally extending supply passage communicable adjacent one end thereof with such discharge port and adjacent its other end with such paste distribution passage, and said handle having a valve control element for operative connection with such valve and being movable between valve opening and valve closing position so as to control the flow of toothpaste from such discharge port, said valve control element being movable in a direction substantially transverse to the longitudinal axis of said elongated component, said elongated component being further characterized by having a cavity extending longitudinally inward from the container-connectable end thereof and providing a first surface portion adjacent the container-connectable end for engagement with such pressurized container and a second surface portion defining a toothpaste receiving chamber connected with said longitudinally extending supply passage and communicable with such discharge port, and a valve stem passage extending longitudinally through said receiving chamber whereby a valve stem located within said stem passage is lubricated by toothpaste within said receiving chamber,

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6. The toothbrush handle of claim 5, wherein said transversely movable valve control element comprises a button member hinged to said elongated component so as to impart limited longitudinal components to such substantially transverse movement, thereby enabling said button member to enforce displacement on such valve in a direction substantially parallel to the longitudinal axis of said elongated component when said button member is depressed in a direction substantially transverse thereto.

7. A toothbrush provided with a handle with a bristle-equipped brushing head at one end having a paste distributing passage extending therethrough and opening at one end into the bristle area of such head for supplying toothpaste thereto, a pressurized toothpaste container arranged for operative connection with said handle at another end thereof, a closure plug attached at its opposite ends to said container and handle and having a passage therein communicable at one end with the toothpaste in the container and at the other end with said paste distributing passage, a valve in said plug passage for controlling the flow of paste from said container, said plug being exposed on the outer side of the toothbrush in common with the handle and container whereby it may be gripped from the exterior of the brush to prevent detachment of the plug from the container, and a valve control element on said handle for operative connection with said valve and being accessible from the exterior of the handle for effecting movement of the valve to open and closed positions.

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