

Jan. 16, 1934.

C. R. COLLINS
FOUNTAIN TOOTHBRUSH

1,944,067

Filed Nov. 4, 1932

2 Sheets-Sheet 1

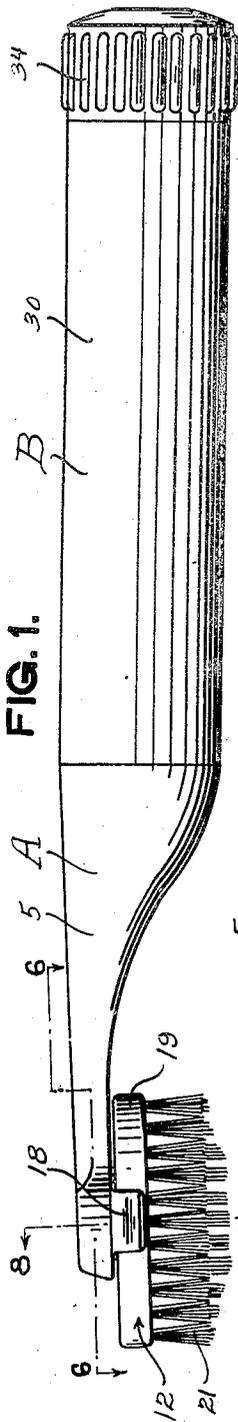


FIG. 1.

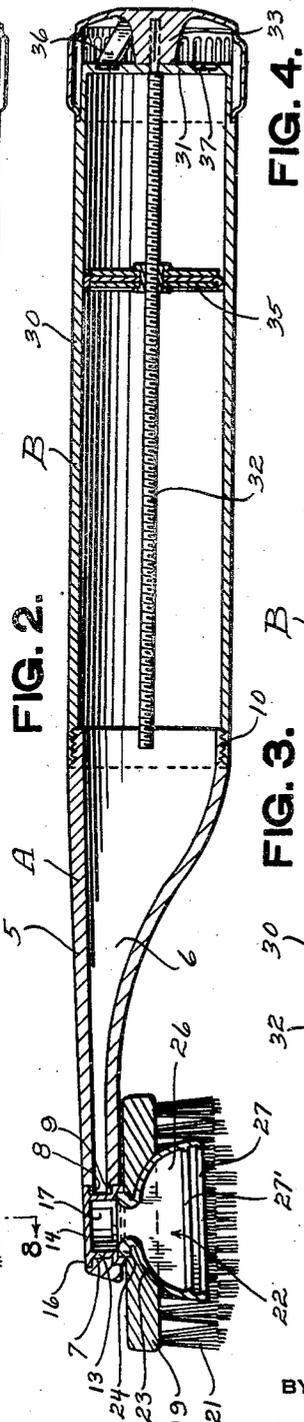


FIG. 2.

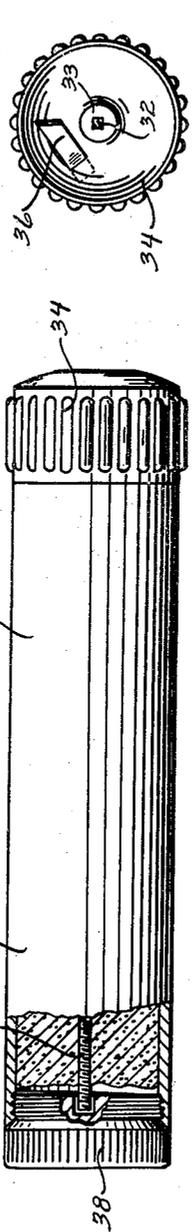


FIG. 3.

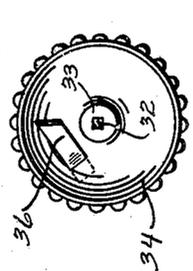


FIG. 4.

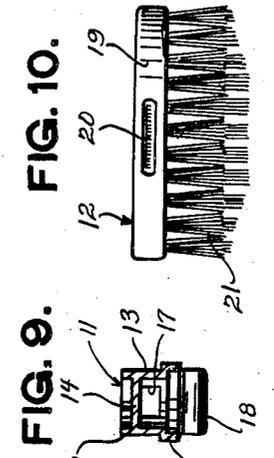


FIG. 9.

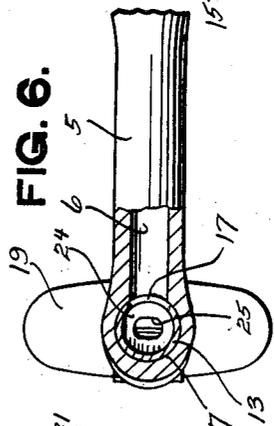


FIG. 6.

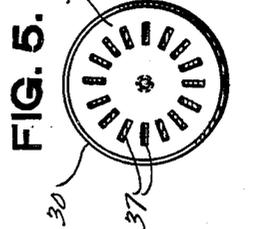


FIG. 5.

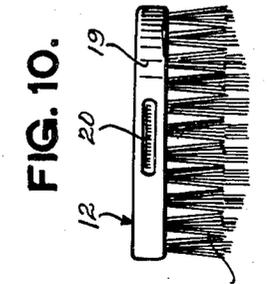


FIG. 10.

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2 Sheets-Sheet 2

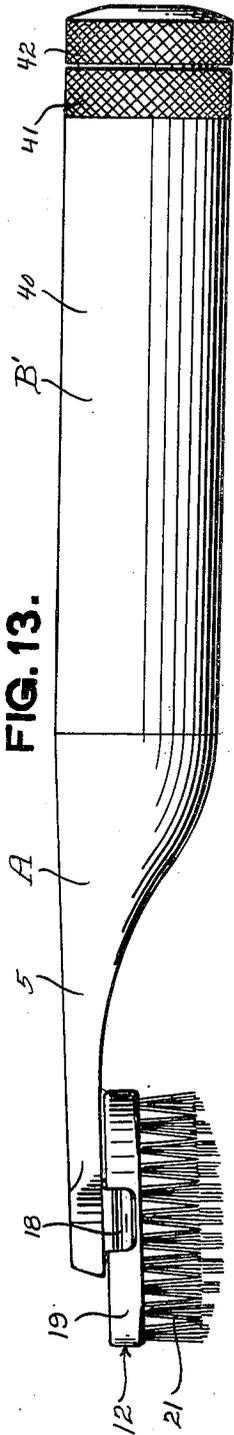


FIG. 13.

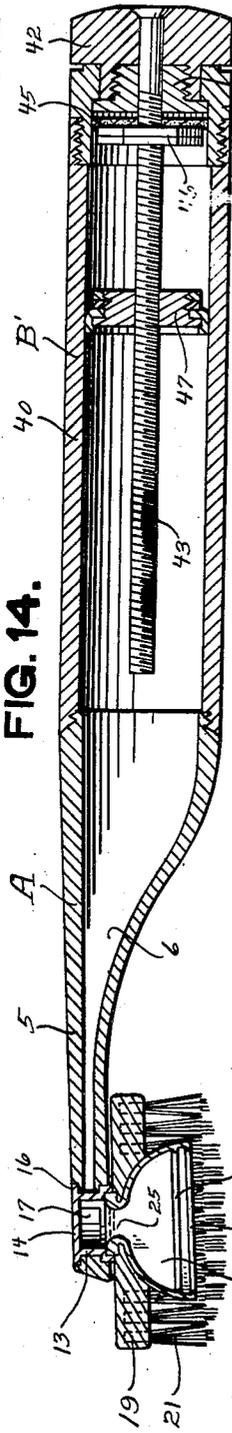


FIG. 14.

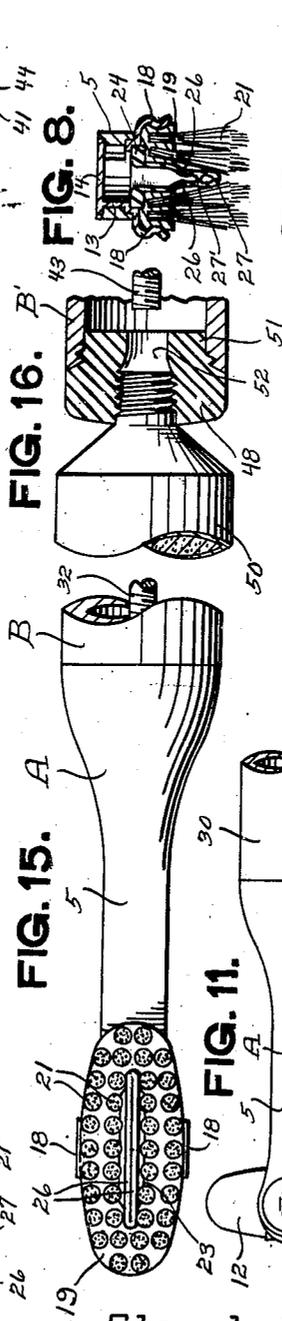


FIG. 15.

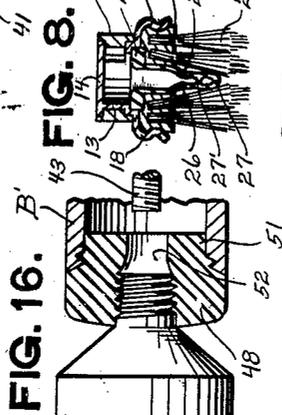


FIG. 16.

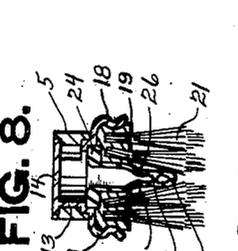


FIG. 17.

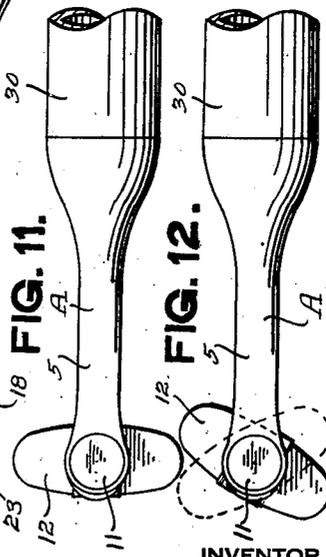


FIG. 11.

FIG. 12.

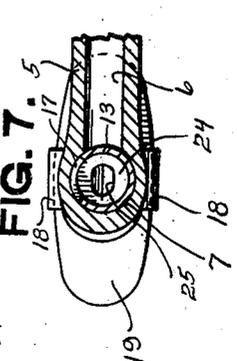


FIG. 7.

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UNITED STATES PATENT OFFICE

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FOUNTAIN TOOTHBRUSH

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Application November 4, 1932. Serial No. 641,235

20 Claims. (Cl. 15—137)

The present invention relates to tooth brushes and the primary object of the invention resides in the provision of a novel fountain tooth brush wherein the brush handle provides a reservoir or container for the dentrifice which may be supplied in regulated quantities directly to the ends of the bristles.

A further object of the invention is to provide a fountain tooth brush embodying means for applying pressure upon the dentrifice, with means for controlling emission of the dentrifice, while under pressure, through a novel distributor to the bristles of the brush head.

A further object of the invention is to provide a fountain tooth brush embodying a removable brush head so rotatably mounted upon the shank portion of the tooth brush as to permit turning of the brush head to any desired angle with respect to the longitudinal axis of the tooth brush.

A further object resides in the novel arrangement whereby feeding of the dentrifice to the bristles of the brush head is controlled by rotation of the brush head serving to open and close a feed duct or channel through which the dentrifice is conveyed to the bristles.

A further object of the invention is to provide a fountain tooth brush having a non-refillable dentrifice container portion embodying an arrangement for maintaining a pressure on the dentrifice.

A still further object resides in the novel manner of mounting the brush head upon a combined valve and brush holder, and the novel construction of the distributor for the dentrifice and serving to provide a sealed joint for the removable brush head.

Other objects and advantages of the present invention will be apparent from the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification and in which drawings:—

Figure 1 is a view in side elevation of the improved fountain tooth brush having a non-refillable paste tube forming the handle.

Figure 2 is a central longitudinal section through the fountain tooth brush shown in Figure 1.

Figure 3 is a view part in section and part in side elevation of one of the renewable tooth paste containers or tubes.

Figure 4 is a plan view of the inner side of the actuating cap.

Figure 5 is an end view of the dentrifice container showing the actuating cap removed.

Figure 6 is a fragmentary detail section on the

line 6—6 of Figure 1 but showing the brush head rotated ninety degrees with the valve in an open position.

Figure 7 is a detail section substantially on the line 6—6 of Figure 1 and showing the brush head in a position closing the valve.

Figure 8 is a section on the line 8—8 of Figure 1.

Figure 9 is a section thru the combined valve and brush head holder showing the construction thereof prior to mounting in the forward end of the brush head shank for controlling escape of the dentrifice.

Figure 10 is a side view of the brush head.

Figures 11 and 12 are fragmentary elevations showing the manner in which the brush head may be rotated.

Figure 13 is a view in side elevation showing a modified form of handle which may be refilled with dentrifice.

Figure 14 is a central longitudinal section through the form of fountain tooth brush shown in Figure 13.

Figure 15 is a plan view showing the arrangement of bristles on the brush head and the outlet end of the paste distributor for applying the tooth paste to the ends of the bristles.

Figure 16 is a fragmentary detail view showing an adapter to facilitate filling of the refillable type of handle from an ordinary tooth paste tube.

Figure 17 is a view part in side elevation and part in section of the filling plug or unit shown in Figure 16.

Referring to the drawings in detail and wherein similar reference characters designate corresponding parts throughout the several views, and referring first to the form of renewable tube, non-refillable handle type of fountain tooth brush shown in Figures 1 to 12 inclusive and Figure 15, the letter A designates a brush section and B a handle section for detachable connection with the brush section A and providing a container for the dentrifice.

The brush section A embodies a hollow neck or shank portion 5 which may either be formed from metal or a suitable molded composition and providing a feed duct or channel 6. The forward reduced end of the shank portion 5 is provided with a transverse, circular way 7 communicating with the forward end of the feed channel 6 and this transverse way 7 is counter-bored at each end as clearly shown in Figures 2 and 3 to provide annular recess seats 8 and 9. The rear end of the shank portion 5 is flared or enlarged into circular formation and is externally screw threaded as at

10 for threaded reception of the handle section B. The transverse circular way 7 is adapted to rotatably receive a combined valve and brush holder generally designated by the numeral 11. The unit 11 aside from controlling flow of dentifrice from the forward end of the feed channel 6, also provides a holder for a removable brush head 12.

The combined valve and brush holder 11 embodies a tubular sleeve portion 13 for rotatably fitting in the transverse way 7 and this sleeve portion is closed at its upper end by an end wall 14 adapted to extend flush with the upper surface of the shank portion 5. The lower or open end of the sleeve portion 13 is outwardly offset or enlarged providing a seating flange 15 for engaging in the annular recess 9. The sleeve portion 13 beyond the end wall 14 is formed with a retaining flange portion 16 which, after the sleeve portion is inserted into the way 7, is bent outwardly into the annular recess 8 for rotatably securing the valve member in the forward end of the shank portion 5. The sleeve portion 13 is provided with a port 17 which extends for not more than ninety degrees of the circumference of the sleeve and this port is intended to align with the forward end of the feed channel 6 when the brush head 12 is in one position with its longitudinal axis at a right angle to the longitudinal axis of the shank portion 5. Thus the sleeve portion 13 provides a valve for controlling escape of the dentifrice at the open lower end of the sleeve. The member 11 is formed below the annular seating flange 15 with a pair of diametrically arranged spring clips or fingers 18 adapted to yieldably engage the side edges of the base plate 19 of the brush head 12.

The base plate 19 is of elongated formation and of oval shape in plan as clearly shown in Figure 6. The side edges of the base plate are provided intermediate their ends with recesses 20 to be engaged by the spring clips 18 for firmly holding the brush head against the lower end of the seating flange 15. The base plate 19 is provided with rows of longitudinally arranged tufts of bristles 21 and these bristles are arranged with the outer rows of bristles longer than the inner rows of bristles to provide a channeled end formation of the bristles with the channel extending longitudinally of the brush head. By grasping the brush head 12 the member 11 may be rotated in the shank portion 5 for aligning the port 17 with the feed channel 6.

The brush head 12 is provided with a flexible paste distributor 22 preferably formed of soft rubber and this distributor is so shaped and arranged as to deliver the paste into the channel formed at the ends of the bristles 21. The paste distributor 22 is extended through the central portion of the base plate 19 as through an elongated opening 23 shaped to conform to the shape of the distributor. The upper end of the distributor is provided with a sealing flange 24 adapted to fit into the seating flange 15 and also in a circular recess provided in the upper side of the base plate 19 whereby a sealed joint is formed between the valve member 11 and the brush head. The flange 24 is provided with an oval-shaped opening 25 through which the paste passes. At the bristle carrying side of the base plate 19 the distributor is formed with a pair of substantially parallel, fan-shaped flaps 26 which project between the central rows of bristles as clearly shown in Figure 8. The flaps 26 extend substantially throughout the length of the brush head and provide a substantially flat dispensing chamber closed

along its open edge by a sealing rib or lip 27. One or more inner sealing ribs or lips 27' may be provided for further sealing the open edge of the distributor. The resiliency of the distributor will normally cause the flaps 26 to be urged toward one another to prevent escape of the paste remaining in the distributor and valve member 11. As will be observed, the open edge of the distributor is arranged in the channel formed along the ends of the tufts of bristles so that the paste emitted from the distributor is delivered into this channel. As will be observed in Figure 8, the center rows of bristles are mounted at an angle so as to practically cover the discharge edge of the distributor.

Referring now to the handle section B for detachable connection with the rear end of the brush section A, this handle section preferably forms the container in which the tooth paste is vended and embodies features preventing refilling of the handle section after the contents have been dispensed therefrom. This handle section embodies a tubular body portion 30 being closed at its rear end by an end wall 31 and internally screw threaded at its forward open end for threaded connection with the external threads 10 at the rear end of the brush section A. Pressure applying means is provided for the dentifrice or tooth paste in the tube 30 and embodies a threaded feed screw 32 extending axially through the tube and journaled at its rear end axially of the rear wall 31. The rear end of the feed screw 32 beyond the wall 31 is squared and rigidly anchored in the hub portion 33 of a hollow actuating cap 34 having its rim portion rotatable upon the reduced rear end portion of the tube 30. The rim portion of the actuating cap 34 may be knurled or ribbed in any preferred manner to facilitate turning thereof. Threaded upon the feed screw 32 is a plunger or piston 35 adapted for forward travel in the tube 30 upon rotation of the cap 34 in a right hand direction. The feed screw 32 is formed with a shoulder at the forward side of the end wall 31 to prevent rearward movement of the actuating cap in the dentifrice tube. As the piston 35 is moved forwardly in the tube 30, the paste will be placed under pressure and held under this pressure until the brush head 12 is rotated for aligning the port 17 with the feed channel 6.

A means is provided for preventing rearward travel of the piston 35 in the tube 30 so as to permit refilling of the tube and this means embodies a spring finger or pawl 36 carried by the cap 34 and having its free end movable over an annular series of indentures 37 provided in the rear face of the end wall 31. The spring finger 36 is arranged to prevent rotation of the actuating cap 34 in a direction which will cause rearward travel of the piston 35 in the tooth paste tube 30. As will be observed, the ratchet arrangement provided by the spring finger 36 and indentures 37 is fully enclosed within the actuating cap so as to prevent raising of the spring finger to permit counter-rotation of the actuating cap.

Figure 3 shows one of the non-refillable handle sections in the manner in which the handles containing the tooth paste are vended, and a closure plug 38 is threaded into the open end of the tube for preventing escape of the tooth paste prior to attachment of the handle forming tube to the brush section A. The handle forming tooth paste container is assembled with the piston 35 against the rear wall 31 so that the tube may be filled with the tooth paste disposed at

the front side of the piston so as to be compressed upon proper rotation of the actuating cap.

Referring now to the form of invention disclosed in Figures 13, 14, 16 and 17, the brush section A is provided with a removable and refillable handle section B' adapted to receive dentifrice in a paste form as from an ordinary tooth paste tube in which the dentifrice is vended. The handle section B' embodies a tubular body portion 40 being internally screw threaded at its forward open end for threaded engagement upon the threads 10 of the hollow shank portion 5. Threaded into the rear end of the tubular body portion 40 is a bushing 41 providing a bearing for an operating knob 42 having attached thereto a feed screw 43 extending axially through the body portion 40. The inner end of the operating knob 42 is provided with a threaded socket for threaded reception of a retaining bushing 44 which co-acts with the operating knob to prevent axial movement of the feed screw in the body portion 40. A sealing washer 45 is held in engagement with the inner surface of the bushing 44 by lock nuts 46. Threaded upon the feed screw 30 is a piston 47 adapted for movement forwardly and rearwardly in the tube 40 upon rotation of the operating knob 42.

A filling unit or bushing 48 is provided to facilitate filling of the handle section B' as from an ordinary tooth paste tube such as shown at 50. This filling unit 48 is preferably made from rubber and is formed with a reduced portion 51 adapted to be inserted into the forward open end of the tubular body portion 40. Formed axially through the unit 48 is a passageway 52 having a flaring or bell-shaped outer end adapted to receive the nozzle of the tooth paste tube 50. In refilling the handle section B', the section 47 is moved to the forward free end of the feed screw 43 and the pliable filling unit 48 inserted into the open end of the tube 40. The nozzle of the collapsible tooth paste tube 50 is then inserted into the opening 52 through the filling unit and the tube compressed for forcing the paste into the tube 40. As the paste is forced into the tube 40, the operating knob 42 is rotated for retracting the piston 47 and this retraction of the piston 47 creates a vacuum tending to draw the tooth paste into the tube 40.

Thus in each form of fountain tooth brush it will be seen that a pressure applying means is provided for placing the tooth paste under pressure, with emission of the tooth paste controlled by rotation of the brush head.

In use of either form of fountain tooth brush, the brush head 12 is rotated to a position whereby the port 17 will be closed and after which the piston in the handle section is advanced for applying a pressure upon the paste. The brush head may then be rotated to a position such as in Figure 6 for aligning the port 17 with the feed channel 6 whereby the paste under pressure will escape through the distributor 22 into the channel formed along the ends of the bristles 21. After a sufficient quantity of the paste has been delivered to the ends of the bristles, the brush head may be rotated to close the port 17. Since the brush head is centrally pivoted, the brush head may be rotated to any desired angular position for use without permitting the port 17 to become aligned with the feed channel 6.

The flexible paste distributor 22 is preferably renewable with the brush head 12 and is of such nature as to readily flex with the bristles 21 dur-

ing use of the brush. The sealing flange 24 of the paste distributor provides a leak-proof joint when the brush head is snapped into position between the spring fingers 18, and these spring fingers are of such length longitudinally of the brush head as to insure rotation of the valve member 11 when the brush head is rotated.

Thus it will be seen that an improved construction for fountain tooth brushes has been provided wherein the brush handle provides a reservoir or container for the dentifrice, with means for applying pressure upon the dentifrice so that delivery thereof upon the ends of the bristles of the brush head may be controlled by rotating the brush head so as to open and close a feed duct or channel thru which the dentifrice is conveyed to the bristles.

Changes in detail may be made to the forms of invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A tooth brush comprising a reservoir section, a shank section having a feed channel in communication with the reservoir section, a valve member rotatable in the shank section transversely thereof and having a port to communicate with the feed channel, a brush head carried by the valve member to rotate the latter and having a material discharge way controlled by the valve member, and means for applying pressure upon the material in the reservoir section.

2. A tooth brush comprising a reservoir section, a hollow shank section communicating with the reservoir section, a valve member transversely rotatable in the shank section for controlling escape of material therefrom, a brush head carried by the valve member and having a distributor in communication with the valve member, and means for applying pressure upon the material in the reservoir section.

3. A fountain tooth brush comprising a dentifrice container, a valve member mounted at one end of the container and rotatable on an axis at a right angle to the longitudinal axis of the tooth brush for controlling escape of the dentifrice, means for placing the dentifrice under pressure in the container, and a brush head carried by the valve member and having a discharge way there-through controlled by the valve member.

4. In a fountain tooth brush, a dentifrice container providing a handle section and a shank portion, a valve member transversely rotatable in the forward end of the shank portion and having a port for communicating with the container, a brush head carried by the valve member and movable into various angular positions with respect to the longitudinal axis of the tooth brush, a dentifrice distributor carried by the brush head and opening into the valve member, and pressure applying means for the dentifrice in the container.

5. A fountain tooth brush comprising a reservoir handle, a hollow shank portion projecting from the forward end of the handle, a hollow valve member transversely rotatable in the forward end of the shank portion and having a port communicating with the interior of the shank portion, a brush head detachably carried by the valve member, a flexible paste distributor carried by the brush head and having communication with the valve member, and pressure applying means for the material in the reservoir handle.

6. A fountain tooth brush comprising a reservoir handle, a hollow shank portion projecting

from the forward end of the handle, a hollow valve member transversely rotatable in the forward end of the shank portion and having a laterally opening port communicating with the interior of the shank portion, a brush head detachably secured midway of its ends to the valve member, a flexible paste distributor carried by the brush head and having communication with the valve member, and pressure applying means for the material in the reservoir handle embodying a piston forwardly movable in the handle.

7. A fountain tooth brush comprising a reservoir handle and a brush section embodying a removable brush head, said brush head embodying a distributor having communication with the reservoir handle section, valve means in the brush section controlled by rotation of the brush head about an axis at a right angle to the longitudinal axis of the tooth brush, and pressure applying means for the material in the reservoir handle section.

8. In a fountain tooth brush, a reservoir section, means for applying pressure to the material in the reservoir section, a brush head rotatably carried by the reservoir section, and valve means actuated by the brush head for controlling delivery of material from the reservoir section to the bristles of the brush head, said brush head being rotatable on an axis at a right angle to the longitudinal axis of the tooth brush.

9. In a fountain tooth brush, a brush section including a hollow shank portion providing a feed channel, a hollow valve member rotatable in the forward end of the shank portion and having a port for aligning with the feed channel, a brush head embodying a base plate detachably connected to the valve member and bristles projecting from the base plate, a flexible paste distributor carried by the base plate to project between the bristles and having an opening communicating with the valve member, and a reservoir handle section connected to the brush section for delivering material from the handle section to the distributor when the brush head is rotated for aligning the port in said valve member with said feed channel.

10. In a fountain tooth brush, a brush section embodying a hollow shank portion providing a feed channel, a hollow valve member rotatably mounted in the forward end of the shank portion and having a port to align with the feed channel, a brush head detachably carried by the valve member embodying a base plate and bristles projecting from the base plate and providing a channel at the ends of the bristles, a flexible paste distributor projecting through the base plate and having communication with the valve member, said distributor embodying fan-shaped flaps for delivering dentifrice into the channel at the ends of the bristles, a handle section for detachable connection with the brush section, said handle section providing a dentifrice container, and means for applying pressure to the dentifrice in the handle section.

11. In a fountain tooth brush of the class described, a brush section including a hollow shank portion providing a feed channel, a combined valve and brush holder embodying a sleeve portion rotatable in one end of the shank portion and having a port to align with the feed channel, said sleeve portion being closed at its upper end, means retaining the sleeve against axial movement, spring fingers projecting from the open end of the sleeve, a brush head embodying a base

plate snapped into position between the spring fingers and bristles projecting from the base plate, and a flexible paste distributor projecting through the base plate having a sealing flange for sealing engagement with the open end of the sleeve and fan-shaped flaps extending between the bristles for delivering dentifrice longitudinally of the end formation of the bristles.

12. In a fountain tooth brush including a hollow shank portion, a sleeve rotatable in the forward end of the shank portion and having a port for communicating with the interior of the shank portion, an end wall closing one end of the sleeve and preventing axial movement of the sleeve in one direction, a seating flange at the open end of the sleeve and preventing axial movement of the sleeve in an opposite direction, spring fingers projecting from the open end of the sleeve at diametrically opposite points thereon, a brush head embodying a base plate having recesses in opposite sides thereof engageable by the spring fingers, and bristles projecting from the base plate, said base plate having an opening therethrough midway its ends, and a flexible distributor secured in said opening in the base plate embodying a sealing flange engageable with said seating flange and fan-shaped flaps projecting between the bristles longitudinally of the base plate.

13. In a fountain tooth brush including a hollow shank portion, a sleeve rotatable in the forward end of the shank portion and having a port for communicating with the interior of the shank portion, an end wall closing one end of the sleeve and preventing axial movement of the sleeve in one direction, a seating flange at the open end of the sleeve and preventing axial movement of the sleeve in an opposite direction, spring fingers projecting from the open end of the sleeve at diametrically opposite points thereon, a brush head embodying a base plate having recesses in opposite sides thereof engageable by the spring fingers, and bristles projecting from the base plate, said base plate having an opening therethrough midway its ends, and a flexible distributor secured in said opening in the base plate embodying a sealing flange engageable with said seating flange and fan-shaped flaps projecting between the bristles longitudinally of the base plate and sealing ribs formed inwardly of the distributor flaps along the open edge thereof.

14. In a fountain tooth brush embodying a reservoir handle, a brush section including a hollow shank portion providing a feed channel closed at the forward end of the shank portion, a circular way formed transversely through the shank portion at the forward end of the feed channel and being counter-bored at each end to provide upper and lower annular seats, a sleeve rotatable in the circular way and having a retaining flange flared outwardly into the upper annular seat, a wall closing the upper end of the sleeve, an outwardly offset seating flange at the lower open end of the sleeve for engaging in the lower annular seat, a pair of spring fingers arranged diametrically of the seating flange, a brush head including a base plate and bristles projecting from the base plate, said base plate having recesses at opposite sides thereof for yieldably receiving said spring fingers, and a flexible distributor projecting through the base plate between the bristles and having a sealing flange having a sealing fit against said seating flange, said sleeve to be rotated by the brush head and having a circumferentially opening port to com-

municate with the feed channel for ninety degrees of rotation of the brush head.

15. In a fountain tooth brush including a brush section embodying a shank portion having a feed channel, a non-refillable handle section including a tubular body portion for connection at one end with the shank portion and opening thereinto, a piston movable in the tubular body portion, means for moving the piston toward the shank portion, and means co-acting with said last mentioned means for preventing movement of the piston away from the shank portion.

16. In a fountain tooth brush including a shank portion having a feed channel, a non-refillable handle section including a tubular body portion for connection at its forward open end to the rear end of the shank portion, a wall closing the rear end of the body portion and provided at its outer side with an annular series of ratchet teeth, a feed screw journaled axially in said wall, a piston movable by the feed screw, a hollow actuating cap rotatable upon the rear end of the tubular body portion and embodying a hub portion rigidly secured to the feed screw, and a spring finger mounted inwardly of the actuating cap and co-acting with said ratchet teeth to permit forward travel of the piston and prevent rearward travel thereof.

17. In a non-refillable handle for fountain tooth brushes, a tubular body portion, a wall closing one end of the tubular body portion and having an annular series of indentures provided in its outer face, a removable closure for the opposite end of the annular body portion, a feed screw journaled at one end in the end closure wall, a piston threaded on the feed screw, a hol-

low actuating cap including a hub portion fixedly secured to the feed screw outwardly of the end closure wall and a sleeve portion overlying the closed end of the tubular body portion, and a spring finger mounted in the actuating cap and engageable in the indentures to permit rotation of the feed screw in one direction only for expelling the dentifrice from the handle.

18. In a fountain tooth brush, a brush section including a channeled shank portion for conveying tooth paste to the brush head of the tooth brush, and a refillable handle section including a tubular body portion for detachable connection at its forward end to the shank portion, a feed screw in the body portion, a piston threaded on the feed screw, an operating knob secured to the rear end of the feed screw for rotation thereof, and means rotatably supporting the operating knob in the rear end of the tubular body.

19. In a fountain tooth brush having a refillable handle provided with means for expelling tooth paste from one end of the handle, a yieldable filling unit for removable insertion into the discharge end of the handle and having an opening therethrough which is bell-shaped at its outer end for slidably receiving a threaded discharge nozzle of a tooth paste tube.

20. A paste refilling unit for refillable handles of fountain brushes, comprising a pliable bushing member having a reduced end portion for insertion into an open end of the handle and having an opening therethrough which is bell-flared at its outer end for insertion of a nozzle through which paste is to be delivered into the handle.

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