

June 10, 1952

L. F. PERWAS

2,599,658

MANUALLY OPERATED PRESSURE FEED FOUNTAIN TOOTHBRUSH

Filed March 1, 1946

4 Sheets-Sheet 1

FIG. 1.

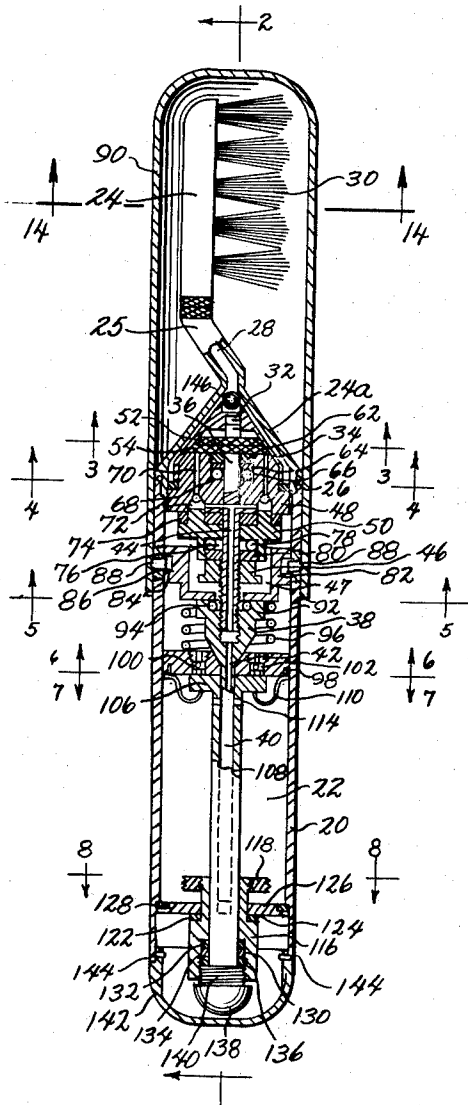
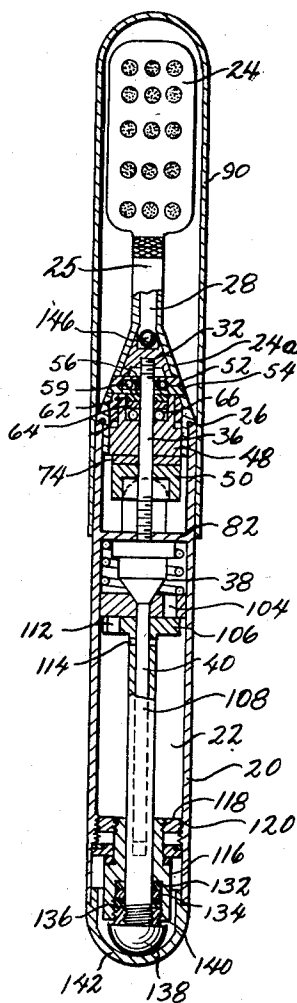


FIG. 2.



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4 Sheets-Sheet 2

FIG. 3.

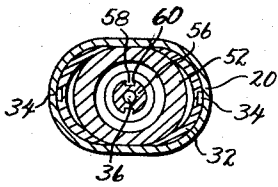


FIG. 6.

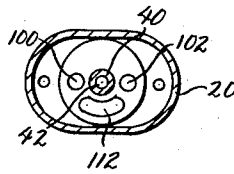


FIG. 4.

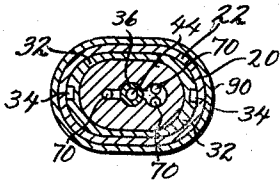


FIG. 7.

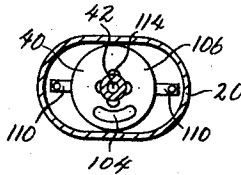


FIG. 5.

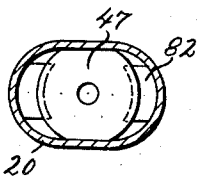
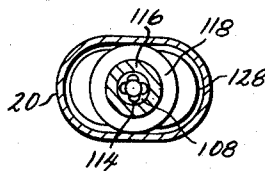


FIG. 8



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MANUALLY OPERATED PRESSURE FEED FOUNTAIN TOOTHBRUSH

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4 Sheets-Sheet 3

FIG. 9.

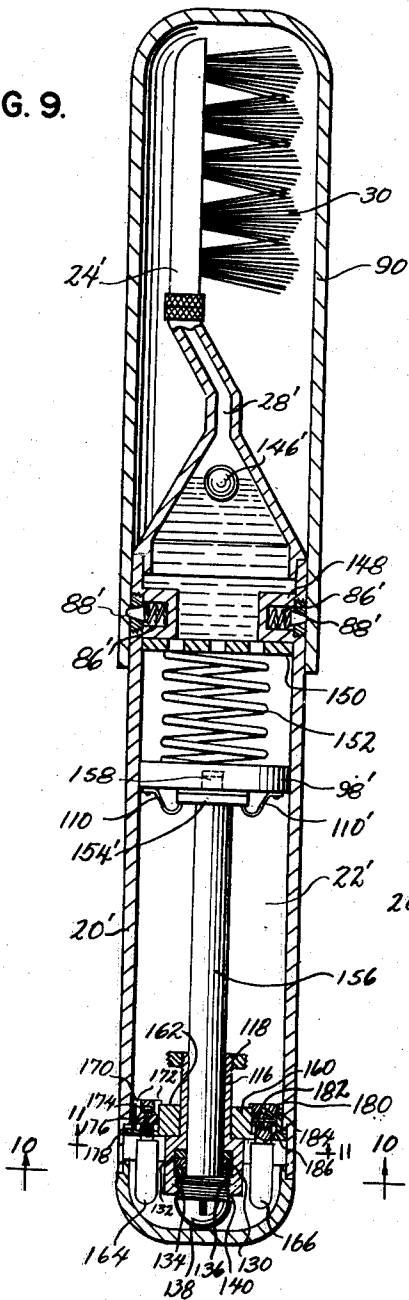


FIG. 10

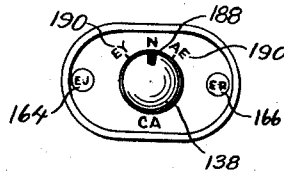


FIG. 11.

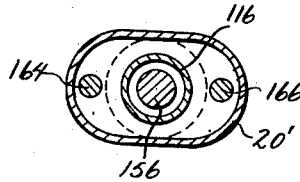


FIG. 12.

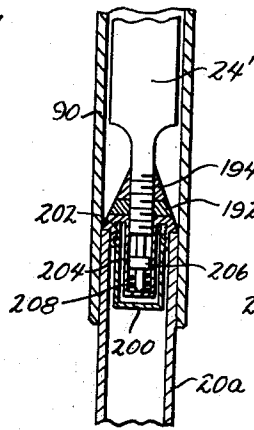


FIG. 13

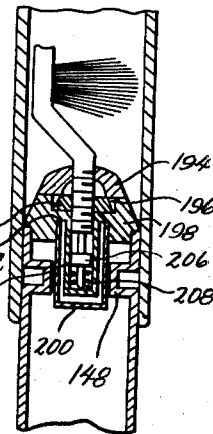
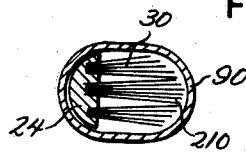


FIG. 14.



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2,599,658

MANUALLY OPERATED PRESSURE FEED FOUNTAIN TOOTHBRUSH

Filed March 1, 1946

4 Sheets-Sheet 4

FIG. 15

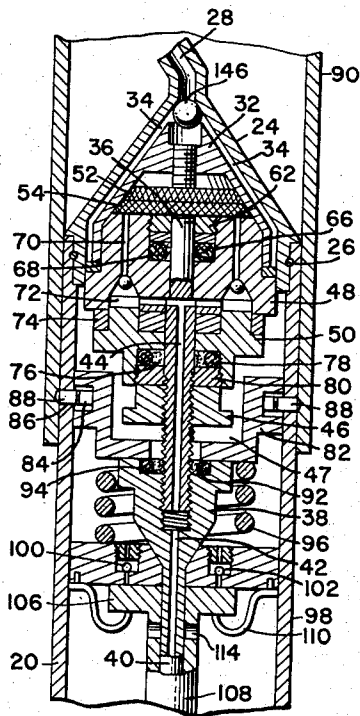
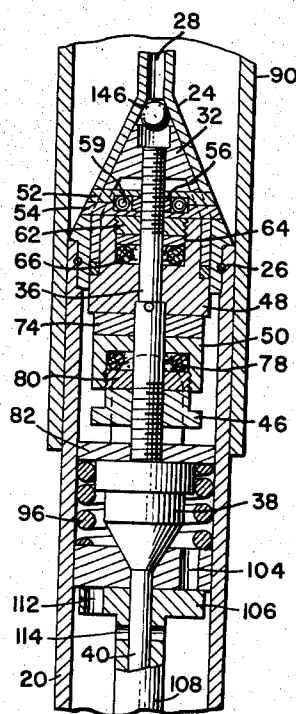


FIG. 16



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MANUALLY OPERATED PRESSURE FEED FOUNTAIN TOOTHBRUSH

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Application March 1, 1946, Serial No. 651,349

3 Claims. (Cl. 222-387)

1

This invention relates to toothbrushes of the fountain type wherein a dentifrice is contained in the handle and supplied to the brush head as desired, and in particular the invention includes a toothbrush having an oval-shaped handle with a reservoir therein and a pump in the handle for forcing a dentifrice to the brush head by air pressure.

The purpose of the invention is to provide a positive feeder for fountain toothbrushes wherein a comparatively small amount of liquid may be supplied to the brush head and then pumped into the bristles with compressed air provided by pumping means in the handle.

The difficulty with the average toothbrush that feeds a dentifrice from the handle to the brush head is to insure positive and continuous feeding particularly as the dentifrice clogs up the relatively small passages in the channels leading to the brush head. With this thought in mind this invention contemplates a fountain toothbrush with pumping means incorporated in the handle for supplying air under pressure to feed the dentifrice to the brush.

The object of this invention is, therefore, to provide positive pressure feeding means for fountain toothbrushes that may be incorporated in the handle of a toothbrush without materially increasing the size thereof.

Referring now to the drawings wherein like reference characters denote corresponding parts the fountain toothbrush of this invention includes a substantially hollow tubular handle 20, oval-shape in cross section, having a reservoir 22 therein and provided with a brush head 24 which has an offset neck 25 with an outwardly flared or conical-shaped end 24a by which the brush head is attached to the end of the handle. A gasket 26 is provided between the part 24a and end of the handle to seal the connection. The neck 25 is provided with a channel 28 through which a dentifrice passes to the bristles 30 of the brush head, as shown.

A member 32 is provided in the end 24a of the neck and inclined channels 34 which communicate with the channel 28 extend downwardly at the sides having the long axis of the handle with the lower ends communicating with the interior of the handle. The upper end of a centrally disposed stud 36 is threaded into the member 32 and the lower end is threaded into a conical-shaped head 38 which carries a vent tube 40. The tube 40 communicates with a passage 42 in the head 38 and the lower part of the stud 36 is provided with an opening 44 that has laterally extending

2

openings at the upper end. A nut 46 positioned in an opening 47 and threaded on the stud 36 secures a housing 48 to the member 32 with a packing gland 50 at the lower end of the housing.

Threaded on the stud 36 is a lock nut 52 which holds a control valve plate 54 against the upper end of the housing 48 and a spring washer 59 is provided between the plate and nut with a thimble 56 having slots 58 in the sides also between the plate and nut provide air escape and inlet passages that register with corresponding openings through the valve plate 54. The nut 52 is provided with keys that extend into the slots 58 as indicated by the numeral 60.

The upper end of the housing 48 is sealed by a nut 62 which holds a washer 64 against packing 66 on a seat 68, and vertically disposed channels 70 extend through the housing and communicate with the passage 44 in the stud 36 through transverse openings 72. The upper ends of the channels 70 are closed by the valve plate 54 and these may be opened by turning the valve plate and lock nut 52. A gasket 74 is provided in the packing gland 50 and around the stud 36 at the center is a seat 76 for the packing ring 78 which is held by a nut 80.

In the upper part of the handle 20 is a transverse partition 82 and at points on the long axis of the handle are springs 84 that hold pins 86 outward and the pins snap into indentations 88 in the brush head cap 90, as shown.

The head 38 on the lower end of the stud 36 is positioned on the lower side of the partition 82 and an annular recess 92 is provided therein for a packing washer 94. A compression spring 96 is also positioned around the head 38 with the upper end bearing against the under surface of the partition 82 and the lower end engaging a piston 98 which has valves 100 and 102 therein and also a slot 104. A disc 106 on a tubular stem 108 is secured against the under surface of the piston by spring fingers 110 and the disc is provided with an opening 112 that is adapted to register with the slot 104 of the piston to provide a direct passage through the piston. The vent tube 40 extending downward from the head 38 extends into the stem 108 and the upper end of the tube 108 is provided with openings 114. On the lower end of the stem 108 is a sleeve 116 the upper end of which is threaded into a nut 118 that is threaded into the sides of the handle across the short axis thereof as shown in Figure 2 with the threads engaging threads 120 of the handle. The sleeve 116 is formed with a shoulder 122 by which it is sealed with a gasket 124 in a closure 126 which is

3

secured in the lower end of the handle and provided with a gasket 128.

The sleeve 116 is provided with a threaded bore 130 in the outer end and the stem 108 is sealed therein by packing 132 held by a washer 134 and a nut 136. A control knob 133 is threaded in the outer end of the bore by a threaded shank 140 by which it is secured on the end of the stem 108 and by turning the knob with the shank thereof unscrewed from the sleeve 116 the disc 106 may be turned so that the opening 112 registers with the slot 104, and the piston may also be reciprocated. A cap 142 is provided on the end of the handle which is secured to the handle by pins 144 which are resiliently held in the cap.

A ball 146 which is mounted in the upper end of the member 32 provides a check valve preventing the dentifrice leaking from the channel 23 into the air vents in the housing 48.

In the design shown in Figures 9 to 11 inclusive, the toothbrush is provided with a handle 20' having a reservoir 22' therein similar to the handle 20 and the cap 90 is secured thereto in a similar manner by spring pins 38' urged outward by springs 35' in bosses 148. In this design the handle is provided with a perforated transverse partition 150 and a spring 152 is provided between the partition and a piston 98' on the under surface of which are springs 110' that hold a plate 154 at the upper end of a tubular stem 156. The upper end of the stem is provided with a pin 158 that extends into a recess in the piston as shown in dotted lines in Figure 9, and the lower end of the stem is provided with a knob 138 similar to the knob of the design shown in Figure 1 and the knob and lower end of the stem are mounted in a similar manner. The parts are similar and the same reference numerals are used for both. In this design the sleeve 116 is held in a closure member 160 with valves 164 and 166 therein, and the valve 164 is mounted in a plug 170 with slots 172 therein and with a valve member 174 coating with a valve seat 176 in a passage 178. The valve 166 is mounted in a plug 180 which has a valve member 182 positioned to coat with a valve seat 184 in a passage 186 therein. An indicator 188 is provided on the knob 138 which is positioned to register with indicia 190 on the face of the member 160 to indicate from the end of the handle, the relative positions of the parts for filling and discharging.

In the design shown in Figures 12 and 13 the upper end of the handle 20a is provided with a bushing 193 and the neck 193 of the brush head 24a is threaded therein and held by a lock nut 192 in a recess 196 and the nut and recess are covered by a closure 194. A tube 200 is mounted in a recess 202 in the under side of the bushing 193, and an inner tubular member 204 with a valve 206 therein extends downward from the bushing. The valve 206 is held upward by a spring 208 to close the end of the neck 193 of the brush.

In Figure 14 the bristles 210 are formed with an arcuate end surface to correspond with the inner surface of the cap 90.

With the parts arranged as described herein the empty toothbrush is first filled by removing the brush head 24 from the end of the neck 25, and with the device inverted the tip of the neck is held in a supply of dentifrice with the cap 142 removed, and the knob 138 turned to the filling position. This locates the opening 112 over the valve 102 and the piston is then reciprocated by the knob 138 so that air is pumped out of the

4

reservoir 22 through the passages 44 and 70 and the valve plate 54, and as the air is pumped out a partial vacuum is created which draws the dentifrice into the reservoir. The amount of liquid in the reservoir may be determined through the transparent member 126 and when the handle is filled the pumping action is discontinued.

When it is desired to use the toothbrush the caps 90 and 142 are removed and the knob 138 set to the position for use. This positions the opening 112 in registering relation with the slot 104 so that dentifrice may pass to the spring chamber, and when a sufficient amount has been deposited therein the knob is turned to the position wherein the opening 112 registers with the valve 100, and with the nut 52 released the knob 138 is reciprocated which will pump air against the liquid in the spring chamber, forcing the liquid into the brush head, and at the same time air will be supplied behind the piston through the passages 44 and 70 and the valve 100 to relieve the pressure.

In the design shown in Figures 12 and 13 the tube 204 permits the supply chamber or reservoir to be emptied when the outlet is above the liquid supply level, as reciprocation of the piston builds up pressure above the liquid which forces the liquid into the brush head.

It will be understood that modifications may be made in the design and arrangement of the parts without departing from the spirit of the invention.

With the above and other objects and advantages in view the invention consists of the novel details of construction, arrangement and combination of parts more fully hereinafter described, claimed and illustrated in the accompanying drawings in which:

Figure 1 is a vertical sectional view of an embodiment of the invention;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is a sectional view on the line 3—3 of Figure 1;

Figure 4 is a sectional view on the line 4—4 of Figure 1;

Figure 5 is a sectional view on the line 5—5 of Figure 1;

Figure 6 is a sectional view on the line 6—6 of Figure 1;

Figure 7 is a sectional view on the line 7—7 of Figure 1;

Figure 8 is a sectional view on the line 8—8 of Figure 1;

Figure 9 is a modified form of the invention;

Figure 10 is a sectional view on the line 10—10 of Figure 9;

Figure 11 is a sectional view on the line 11—11 of Figure 9;

Figure 12 is a detailed fragmentary sectional view of a modified brush head;

Figure 13 is a view of the same in section turned on an angle of 90° and

Figure 14 is a sectional view of the brush head taken on line 14—14 of Figure 1 but showing the bristle tufts provided with curved working surfaces.

Figure 15 is a detail showing the intermediate part of the fountain toothbrush as shown in Figure 1, on an enlarged scale.

Figure 16 is a detail similar to that shown in Figure 15 showing the parts as illustrated in the intermediate part of Figure 2, on an enlarged scale.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a fountain toothbrush, the combination, which comprises, an elongated substantially hollow tubular handle, oval shape in cross section, a tubular offset neck removably mounted on the end of the handle, a brush head having bristles on one side with outlet openings adjacent the bristles removably mounted on the end of the neck, a transverse partition with passages extending therethrough in the end of the handle from which the neck extends, said neck having a transverse opening therethrough, a valve member positioned in the end of the handle and extending into the transverse opening of the neck, a valve on said valve member controlling inlet and outlet air passages in the valve member, a piston having a slot therethrough and valves therein slidably mounted in said handle, a spring urging the piston away from the partition, a closure member in the outer end of the handle, a tubular stem longitudinally slidable in said closure member having a knob on the outer end and a valve plate on the inner end and positioned against the piston, spring fingers holding the plate against the piston, said plate having an opening therethrough positioned to register alternately with the slot through the piston and with the valves therein, and a sleeve in said closure member having a threaded socket in the outer end adapted to receive the knob at the outer end of the stem extending from the piston whereby the knob may be released to reciprocate the piston.

2. A fountain toothbrush as described in claim 1 having a centrally disposed air inlet and outlet passage extending from the valve member through the partition, piston and stem and opening into the interior of the handle through the stem.

3. In a fountain toothbrush, the combination which comprises an elongated substantially hol-

low tubular handle, oval shape in cross section, a tubular offset neck removably mounted on the end of the handle, a brush head having bristles on one side with outlet openings adjacent the bristles removably mounted on the end of the neck, a transverse partition with passages extending therethrough in the end of the handle from which the neck extends, a piston having a slot therethrough and valves therein slidably mounted in said handle, a spring urging the piston away from the partition, a closure member in the outer end of the handle, a tubular stem longitudinally slidable in said closure member having a knob on the outer end and a valve plate on the inner end and positioned against the piston, spring fingers holding the plate against the piston, said plate having an opening therethrough positioned to register alternately with the slot through the piston and with the valves therein, and a sleeve in said closure member having a threaded socket in the outer end adapted to receive the knob at the outer end of the stem extending from the piston whereby the knob may be released to reciprocate the piston.

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