No. 886,996. PATENTED MAY 5, 1908.

H. L. LORING.

FOUNTAIN BRUSH.

APPLICATION FILED MAR. 11, 1907.

Fig. 1.

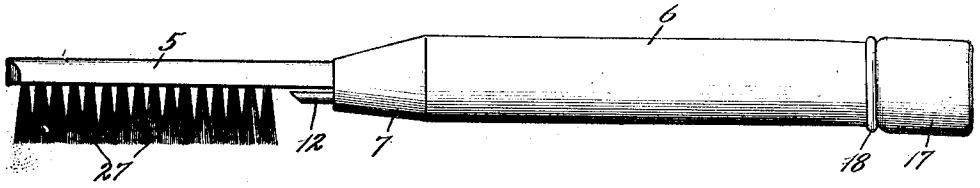



Fig. 2.

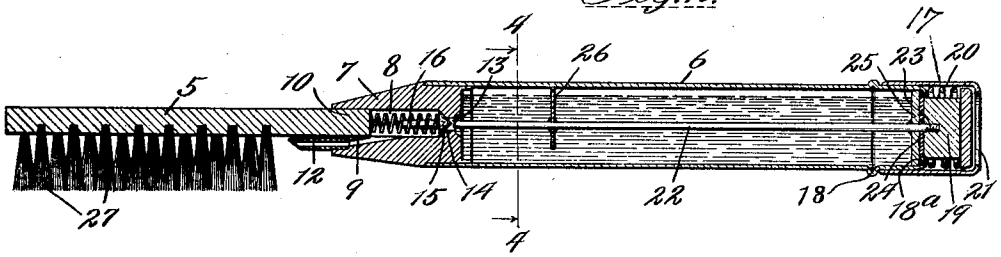



Fig. 3.

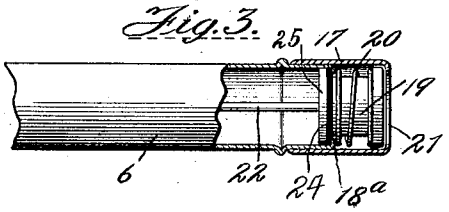
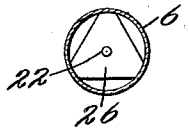



Fig. 4.




Witnesses:

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# UNITED STATES PATENT OFFICE.

HENRY L. LORING, OF CHICAGO, ILLINOIS.

## FOUNTAIN-BRUSH.

No. 886,996. Specification of Letters Patent. Patented May 5, 1908.

Application filed March 11, 1907. Serial No. 361,754.

*To all whom it may concern:*

Be it known that I, HENRY L. LORING, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Fountain-Brushes, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to improvements in fountain brushes, one of the objects of the invention being the provision of a device of this kind having simple and efficient means for supplying liquid from the reservoir to the bristles of the brush.

Another object of the invention is to provide such a device in which the loss of liquid by leakage, evaporation or otherwise is wholly prevented when the device is not in use.

A further object is to provide a brush in which the strength and durability of certain parts of the brush are not impaired.

In the accompanying drawings I have shown my invention as applied to a tooth-brush, but it is to be understood that this invention, while particularly well adapted for use in connection with a brush of this kind, is also adapted for use with other brushes, and I illustrate its application to a tooth-brush merely for convenience.

In these drawings Figure 1 is an elevational side view of a tooth-brush provided with means embodying my invention; Fig. 2 is a central longitudinal section of the same; Fig. 3 is a broken view, partly in section, of the rear end of the handle of the brush; and Fig. 4 is a cross-sectional view, the section being taken on the line 4—4 of Fig. 2, looking in the direction indicated by the arrows.

In the several figures of the drawings, in which like reference numerals indicate the same parts throughout,

5 is the brush proper, and 6 is a hollow handle constituting a fountain or reservoir. This reservoir may be cylindrical in form and may be made of sheet metal, such as nickel-plated brass, or hard rubber or similar material. This reservoir 6 is provided at its forward end with a tapered end-piece 7 adapted to be slipped into the end of the reservoir 6 and to fit tightly therein. The end-piece 7 is provided with an opening 8 extending centrally therethrough. The end piece or plug 7 is also provided with a duct or passage 9 of smaller diameter than the opening 8, the passage 9 being inclined so as to merge into the opening 8.

The brush 5 has a cylindrically-formed neck or shank 10, this neck being adapted to fit snugly in the passage 8 in the plug 7 so as to make a tight fit therein. A short tube 12, of small diameter, is inserted into the passage 9, and, with this passage, forms a duct for conducting liquid to the bristles of the brush. The end-piece 7 is provided with a central opening 13 of small diameter leading from the passage 8 to the interior of the reservoir, and the inner end of the passage 8 is tapered to form a valve-seat 14 for a cone shaped valve-piece 15 adapted to close the passage 13. This valve-piece 15 is pressed toward its seat 14 by a spring 16, the valve being thus normally closed, whereby the escape of liquid from the reservoir is prevented.

The rear end of the reservoir 6 is provided with a cap 17 adapted to be slipped on over the end of the reservoir 6 and to abut a raised flange 18 which is formed on the reservoir 6. The extreme end of the reservoir 6 is formed with an inturned flange $18^a$. A movable plug or button 19 is arranged to reciprocate within the cap 17, and is pressed rearwardly by a spring 20, this spring being seated against the inturned flange $18^a$ on the reservoir 6. The cap 17 is formed with an opening 21 through which the thumb or finger of the operator may be inserted to press the button 19 inward. A stem or rod 22 extends longitudinally and centrally through the reservoir 6 and is provided at its rear end with screw-threads 23 adapted to take into a screw-threaded aperture in the button 19. This stem 23 has arranged thereon, and against the end of the button $19^a$, a soft rubber washer 24 adapted to be normally seated against the inturned flange $18^a$ by the action of the spring 20. A disk 25, of metal or hard rubber, is secured to the rod 22 and so arranged that when the button 19 and rod 22 are moved backward by the spring 20 the soft rubber washer 24 is firmly held against the flange and the disk 25. The disk 25 and washer 24 thus form a plunger or piston adapted to reciprocate in the reservoir 6. Means are provided for maintaining the opposite end of the rod 22 in the center of the reservoir 6, such means conveniently consisting of a substantially triangular plate 26 secured on the rod 22. The rod 22, when moved longitudinally by the pressure of the

finger on the button 19, strikes the valve piece 15 and moves away from its seat, thereby permitting the flow of liquid from the reservoir 6 into the passage 8 and thence outward through the tube or duct 12.

In use, the reservoir will be filled with dentifrice by removing the end-piece 7 and pouring into the open end of the reservoir the desired quantity of dentifrice.

In operation the action is as follows: Pressure of the finger upon the button 19 moves the plunger or piston forward in the tubular reservoir 6, thus creating a state of pressure within the reservoir in excess of atmospheric pressure. At the same time the valve 15 is opened by the pressure of the end of the rod 22 against this valve and the liquid is expelled and is thrown onto the bristles 27 of the brush 5. When the finger of the operator is removed from the button 19, the spring 20 forces the piston backward and into engagement with the flange $18^a$; at the same time the spring 16 thrusts the valve-piece 15 into engagement with its seat 14. The valve-piece 15 will not abut its seat 14 until the piston has reached or nearly reached the limit of its movement in the outward direction, air being thus permitted to find its way back through the tube 12 and passage 9 and past the valve-piece 15 so as to prevent the formation of any vacuum within the reservoir 6. The piston being firmly seated against the flange $18^a$, there is no leakage of liquid at this point.

It has been proposed to provide a long duct extending among the bristles of the brush and provided with openings along its sides for the passage of liquid to the bristles. One of the objections to such a construction is that the bristles are placed along the brush in rows lying close together and the insertion of a tube among these bristles bends them apart and injures the brush. If a special brush be made having a row of bristles omitted therefrom so as to provide space for the tube the appearance and efficiency of the brush are impaired. The most serious objection, however, to such a construction, is that the tube, if made small enough for the purpose, is so small as to be readily clogged up by the drying of the dentifrice. This liquid is a sweetened substance which on drying will clog up any small openings. In my device I make the tube of large enough diameter to prevent such clogging and by forming the opening in the end of the tube and projecting the liquid from this open end upon the bristles I overcome the defects inherent in devices such as outlined above.

As is well known, if a tube filled or partly filled with liquid be closed at one end and held with the opposite end down, the liquid contained therein will not readily run out of the lower open end of the tube, because of atmospheric pressure, especially if the lower end of the tube be somewhat contracted. To permit the liquid to flow from the open end of such a tube an opening must be made somewhere in the tube to admit air, or, if this is undesirable, some means may be provided for decreasing the volume of the space within the tube, as by the inward movement of a piston.

It will be seen that in the device hereinabove described, and shown in the accompanying drawings, I have provided a piston or plunger which is adapted, by the pressure of the finger applied thereto, to be moved forward in the tubular reservoir, thus decreasing the volume of the space within the reservoir. This tends to create pressure within the tube in excess of atmospheric pressure and if an opening be provided through which the liquid may escape and the device be held in such a position that this opening is covered by the liquid, a quantity of liquid will evidently be expelled with considerable force through this opening.

It will be seen that I have provided means whereby the forward movement of the piston is accompanied by the opening of the passage leading to the bristles of the brush. As the area of the piston is much greater than that of the opening, a slight inward movement of the piston will force a considerable amount of liquid through this opening. Upon the rearward movement of the piston and the consequent tendency to the formation of a vacuum within the device, air is permitted to pass inward through the opening and the valve 15 does not become seated so as to close this opening until the piston has practically reached the limit of its rearward movement.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a fountain brush, a tube constituting a handle for the brush and adapted to contain liquid, said tube having an inturned flange on one of its ends, a plunger working in said tube, a spring adapted to move said plunger toward the end of the tube and normally to hold the same in contact with said flange, means for manually moving said plunger forward in said tube, and a spring-closed valve at the opposite end of the tube adapted to be opened upon forward movement of the plunger, and a cap covering said spring and provided with an opening affording access to the plunger.

2. In a fountain brush, a reservoir-handle, a brush carried thereby having a neck and tufts of bristles arranged non-parallel with the axis of said neck, said reservoir-handle having a duct leading to said bristles without passing through the neck and open at its end only, a valve in said duct, means for manually opening said valve and a piston operating in said reservoir-handle for increasing the

pressure therein simultaneously with the opening of said valve.

3. In a fountain brush, the combination with a tubular handle constituting a reservoir and carrying at one of its ends the brush proper, of a duct leading from said reservoir to said brush proper, said handle having upon its opposite end an inturned flange, a plunger within said tubular handle, a spring normally holding said plunger in contact with said flange, a button for manually moving said plunger forward, and a cap adapted to be telescoped onto the end of the tubular handle and having an opening providing access to said button.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

HENRY L. LORING.

Witnesses:
HARRY E. LORING,
C. L. HOPKINS