Aug. 25, 1942. CHAO-HSING CHU 2,294,285

FOUNTAIN TOOTHBRUSH

Filed Sept. 30, 1939

Fig. 1

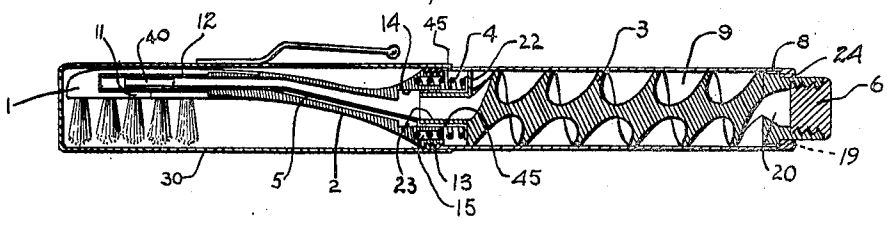


Fig. 2

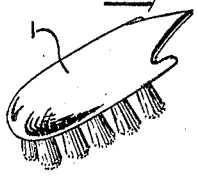


Fig. 3

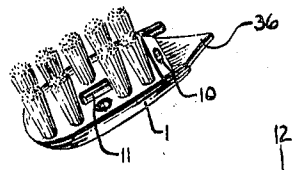


Fig. 4

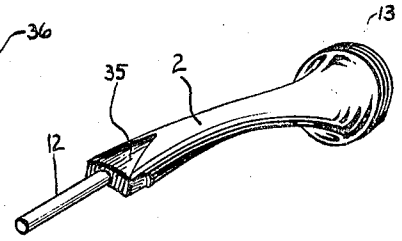


Fig. 5

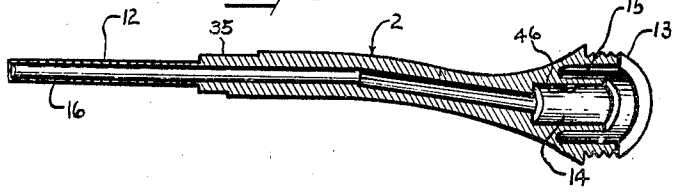


Fig. 8

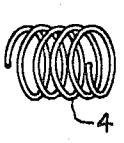


Fig. 6

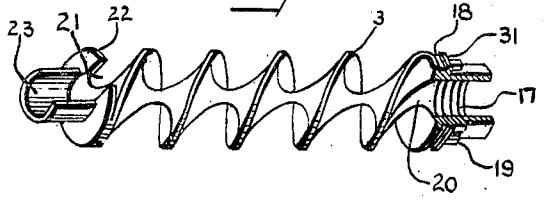


Fig. 9

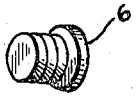


Fig. 10

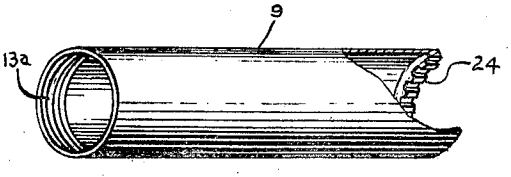
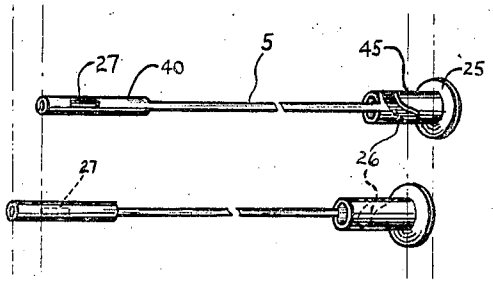


Fig. 7



Chao-hsing Chu

INVENTOR.

BY Morgan, Finnegan & Dunham

ATTORNEYS.

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UNITED STATES PATENT OFFICE

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FOUNTAIN TOOTHBRUSH

Chao-Hsing Chu, Dearborn, Mich.

Application September 30, 1939, Serial No. 297,202

4 Claims. (Cl. 15—137)

The invention relates to a combined toothbrush and dentifrice holder whereby dentifrice from the holder may be supplied to the brush, the two being built and coordinated as a self-contained unit.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawing, referred to herein and constituting a part hereof, illustrates one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawing:

Fig. 1 is a longitudinal central vertical section of a fountain toothbrush embodying my invention;

Fig. 2 is a perspective detail of the removable brush element viewed from the top and side;

Fig. 3 is a similar view from the side and bottom of the brush element;

Fig. 4 is a perspective detail of the connecting member between the brush and the dentifrice supply;

Fig. 5 is a longitudinal vertical section of the device shown in Fig. 4;

Fig. 6 is a detail in perspective of the dentifrice feeding screw;

Fig. 7 shows two perspective views in different positions of operation of the dentifrice valve member;

Fig. 8 is a perspective detail of the feeding control spring;

Fig. 9 is a similar view of the enclosure cap nut; and

Fig. 10 is a perspective, with parts broken away, of the dentifrice containing tube.

Objects of the invention are to provide a fountain toothbrush having exceedingly simple mechanical construction; large dentifrice capacity; simple means for filling and refilling same with dentifrice; simple and compact but durable means for feeding and controlling the feed of dentifrice from the supply to the toothbrush; and to provide means whereby all the elements of the device are readily separable for cleaning yet which can be very simply reassembled by the user.

It will be understood that the foregoing general description of the invention and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the present preferred embodiment of the invention illustrated by way of example in the accompanying drawing, the major parts of my fountain toothbrush comprise the removable brush or bristle element 1, a brush-supporting and dentifrice-feeding conduit 2, a dentifrice-containing tube or chamber 9 which also functions as the brush handle, a dentifrice-feeding or conveying spiral member or screw 3, a compressible connecting spring 4 between the dentifrice chamber 9 and the brush support 2, a removable end closure 6 and a dentifrice feed control valve member 5. Preferably also the device is provided with a removable brush guarding cap or cover 30 which fits onto the dentifrice chamber 9.

Referring first to the means for containing the supply of dentifrice and for propelling or extruding same toward the brush, the tubular chamber 9 is designed to receive and house a spiral screw feed member 3, the peripheral threads of which fit closely within the inner walls of the chamber 9 so as to be rotatable therewithin. The rear or dentifrice receiving end of the screw 3 is provided with a channel 20 for the introduction of tooth paste or the like and is internally threaded at 17 for the reception of an end closure cap 6, the shank of which is conformably threaded as shown. A portion of the shell forming the conduit 20 is enlarged to provide for a gasket seat 18 wherein may be seated a rubber gasket 8 or the like between the screw and the inner surface of the tube 9. Spaced apart lugs or teeth 19 project from the shoulder 31. The spaces between teeth 19 are normally engaged by conforming teeth 24 at the end of the tube 9, thereby to prevent rotation between the screw 3 and the tube 9.

Referring now to the interconnection between the brush-supporting and dentifrice-feeding member 2 and the forward or inner end of the chamber 9 and its associated parts, said forward end of chamber 9 is internally threaded at 13a to engage the externally threaded enlarged end 13 of the member 2, thereby providing a rigid connection between the handle-chamber 9 and the brush holder conduit 2. Means are provided for affording a sliding compressible connection between the end 13 of the member 2 and the spiral dentifrice feed screw 3. As shown, said

means comprise a normally expanded helical spring 4, one end of which is seated against a circular flange 22 at the inner end of the spiral 3 and surrounds the reduced dentifrice conduit 23 projecting therefrom. A notch 21 in the flange 22 provides an outlet for dentifrice from the chamber 9 through the conduit 23. The opposite end of spring 4 is seated in a cylindrical recess 15 formed within the enlarged end 13 of the member 2. An inner wall 14 surrounds the inner end of the conduit 23 and provides a guide therefor and on its outer surface for the spring 4. It will be clear that the spring 4 thus surrounds the telescoping parts 23 and 14 of the members 3 and 2 respectively and as shown is normally in an expanded condition.

In order to provide a conduit for dentifrice coming from the feed screw 3 to the brush the member 2 is internally hollowed throughout its length forming a tube 12 which projects in reduced form beyond the main structural portion of the member 2. The main stem or body of the member 2 is designed to receive and support the brush 1. For this purpose the upper surface of the member 2 is provided near its end with a V-shaped recess 35 into which a conforming tongue 36 on the brush 1 is adapted to fit. Further support is afforded between the brush 1 and the member 2 by a channel 10 in the body or backing of the brush into which the projecting dentifrice tube 12 is adapted to seat. A dentifrice opening 11 is provided between the channel 10 and the lower or bristle-engaging surface of the brush 1 and said opening 11 is positioned to communicate with a conforming opening 16 in the tube 12 of the member 2.

The invention provides means for controlling the feed of dentrifice from the conduit 12 through the apertures 16 and 11 to the brush. As embodied, a valve mechanism comprising the connecting stem 5 is designed to control the opening between the apertures 16 and 11 so that paste or other dentifrice will be fed therethrough only when the spiral feed screw 3 is compressed and rotated. As embodied, the feed end 40 of the member 5 is formed as a cylinder having a feed port 27. Feed cylinder 40 lies within and is rotatable relative to the conduit 12, the port 27 normally being to the rear of and out of angular alignment with openings 16 and 11. The opposite or rear end of the member 5 is also formed as a cylindrical member 45 which is adapted to be telescoped between the outer surface of the conduit 23 on screw 3 and the inner surface of sleeve 14 on the member 2. An open cam track 26 is formed in sleeve 45 and is adapted to be engaged by a pin 46 projecting inwardly from the surface of the sleeve 14. A circular flange 25 is provided at the rear end of the sleeve 45 to lie against the flange 22 on the screw 3.

In operation, assume that the chamber 9 is filled with dentifrice such as tooth paste of any usual consistency. Pressing on the cap 6 disengages the teeth 19 and 24 so that the screw 3 may be rotated within the chamber 9. Such rotation froces a measure of tooth paste along the conduits 23 and 12 toward the brush. The initial translation of the screw 3 with respect to the member 2 (against the compression of spring 4) advances the valve member 5 and the pin 46 engaging cam track 26 rotates member 5 so as to bring the port 27 into alignment with the ports 11 and 16. Thereby a load of dentifrice is extruded onto the brush. Upon releasing the compression on member 6 the parts return to their original position.

To fill the chamber 9 with dentifrice the cap screw 6 is removed and a tooth paste tube having the conventional threaded end is screwed into the receptacle 17. By squeezing and rotating the tooth paste tube, the chamber 9 is thus filled with dentifrice. If desired, the chamber may be filled with powder in lieu of paste.

The entire device may be readily cleaned by removing the brush head 1 and unscrewing the member 2 from the casing 9, whereby the remaining parts may be readily separated. It will be clear that they may be as readily reassembled as shown.

I prefer to make many of the parts, such as the casing 9, the screw 3 and the portion 2 surrounding the paste conduit 12 of a moulded plastic, preferably transparent, such as "Tenite," thereby increasing the attractiveness and cleanliness of the device and also rendering immediately perceivable the amount of dentifrice present in the chamber 9.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. A fountain toothbrush including in combination a brush, a dentifrice container comprising a hollow cylindrical member, a conduit from said container to the brush, a screw-shaped member rotatably and axially slidably mounted in said container and having rotary engagement with the inner walls thereof for feeding dentifrice through the container and conduit to the brush, and valve means operated by movement of the screw member to control the feed of dentifrice from the conduit to the brush.

2. A fountain toothbrush including in combination a brush, a dentifrice container comprising a hollow cylindrical member, a conduit from said container to the brush, a screw-shaped member rotatably and axially slidably mounted in said container and having rotary engagement with the inner walls thereof for feeding dentifrice through the container and conduit to the brush, and valve means operated by axially sliding movement of the screw member to control the feed of dentifrice from the conduit to the brush.

3. A fountain toothbrush including in combination a brush, a dentifrice container comprising a hollow cylindrical member, a conduit from said container to the brush, a screw-shaped member mounted in said container and having rotary engagement with the inner walls thereof for feeding dentifrice through the container and conduit to the brush and valve means operated by movement of the screw member to control the feed of dentifrice from the conduit to the brush.

4. A fountain toothbrush including in combination a brush head, a dentifrice container, a conduit member from said container to the brush head, a screw member axially slidably and rotatably mounted within the container for feeding dentifrice through said conduit, valve means extending along the conduit and into the brush head to control the feed of dentifrice from the conduit to the brush, and cam means on said valve means for actuating the valve means by axially sliding movement of the screw member.

CHAO-HSING CHU.