

Jan. 12, 1954

W. MARTINO

2,665,442

TOOTHBRUSH WITH REFILLABLE DENTRIFICE DISPENSER

Filed April 16, 1949

Fig. 1.

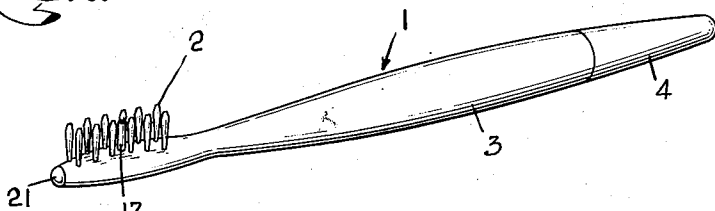


Fig. 2.

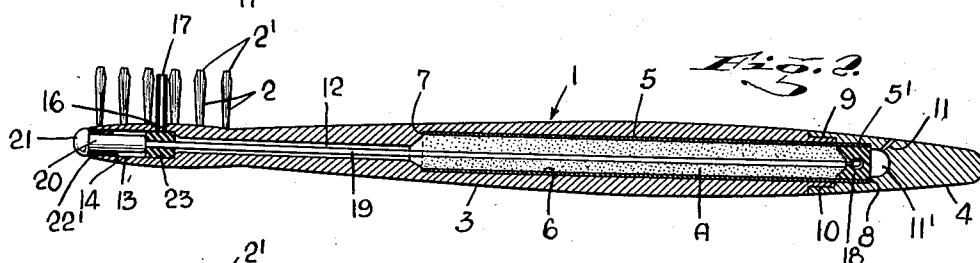


Fig. 3.

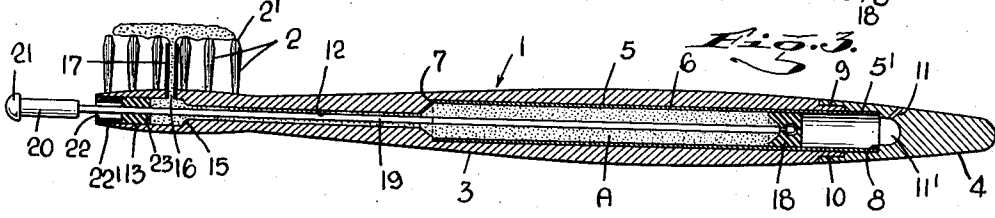


Fig. 4.

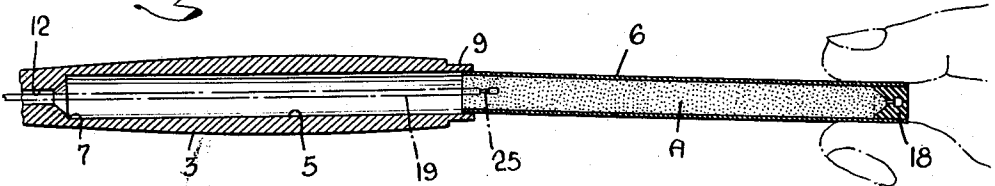


Fig. 6.

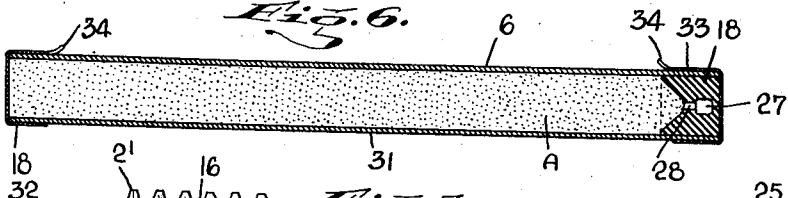


Fig. 7.

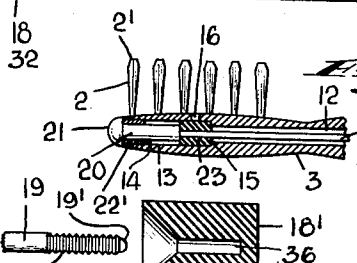
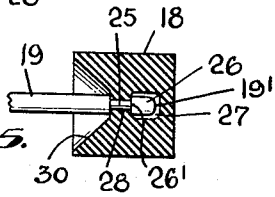


Fig. 5.



INVENTOR.

WILLIAM MARTINO

BY *Banlett, Eyre, Keck & Weyman*

ATTORNEYS

Fig. 8.

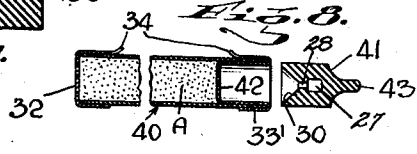
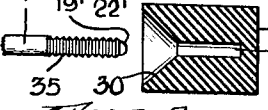


Fig. 5A.



UNITED STATES PATENT OFFICE

2,665,442

TOOTHBRUSH WITH REFILLABLE
DENTIFRICE DISPENSER

William Martino, Westbury, N. Y.

Application April 16, 1949, Serial No. 87,970

6 Claims. (Cl. 15-137)

1

This invention relates to tooth brushes.

One object of the invention is a novel and improved tooth brush-dentifrice-container unit.

Tooth brushes have been proposed wherein the tooth brush handle is adapted to contain tooth paste for supply to the brush end of the unit. The prior proposals with which I am familiar would be unsatisfactory for sanitary and other reasons.

One object of the invention is a novel and improved tooth brush-dentifrice-container unit which is characterized, among other things, by the ease with which the dentifrice may be supplied in the exact desired quantity to the bristles of the brush, by its simplicity in construction and use, by the effective seal of the dentifrice within the tooth brush and by the marked sanitary conditions in the normal use of the unit.

A further object of the invention is a novel and improved unit of the above indicated character having a novel readily replaceable dentifrice refill cartridge.

A further object of the invention is a novel and improved unit of the above indicated character which is further characterized with the ease and facility with which a refill cartridge may be replaced, by the novel and improved means for dispensing the dentifrice to the bristles of the brush and by its compactness.

A further object of the invention is a novel and improved combined magazine handle and refill cartridge.

For a better understanding of the invention reference may be had to the accompanying drawings forming a part of this application, wherein

Fig. 1 is a perspective view of a tooth brush unit embodying the invention;

Fig. 2 is a longitudinal sectional view thereof;

Fig. 3 is a longitudinal sectional view thereof showing the dispensing of the dentifrice to the bristles of the brush preparatory for use;

Fig. 4 is a longitudinal sectional view illustrating the insertion of the dentifrice refill cartridge;

Fig. 5 is an enlarged sectional view of a part of the refill;

Fig. 5A shows a modification;

Fig. 6 is a longitudinal sectional view of a dentifrice refill cartridge embodying the invention;

Fig. 7 is a sectional view of a part of the brush showing a modification; and

Fig. 8 shows a modification.

Referring to the drawings, I have illustrated my invention as embodied in a tooth brush-dentifrice-refill unit indicated by the numeral 1. This is provided with any conventional brush bristles 2. The unit comprises a handle which is formed of two parts, a main body part 3 and a

2

closing cap 4. These are provided with an elongated cylindrical magazine chamber 5, 5', the cylindrical chamber 5 being formed within the handle part 3 and the chamber 5' being formed in the cap part 4 and forming a continuation of the chamber 5 when the cap 4 is in position on the main handle part 3. A dentifrice or tooth paste refill 6 is contained within this magazine chamber 5, 5'. In the assembled position the lefthand end of this refill 6 rests against an annular shoulder 7 formed at the lefthand end of the cylindrical chamber 5 while the righthand end of the refill rests against an annular shoulder 8 formed at the righthand end of the cylindrical chamber 5' on the interior of the cap 4. The cap 4 may be fastened to the main body part 3 in any suitable manner. In the particular embodiment shown the righthand end of the main body part 3 of the handle is reduced in diameter as indicated at 9 to fit on correspondingly formed inner surface 10 on the lefthand end of the cap 4. When thus fitted together the outer surfaces of the parts 3 and 4 form a continuation of each other. The connection between the cap 4 and the main body part 3 of the handle may be any conventional connection as, for example, frictional, screw-threaded or otherwise. The cap part 4 has a ventilating opening 11 therein leading to a chamber 11' just to the rear of the refill cartridge 6.

The lefthand end of the brush handle 3 is provided with a longitudinal passage 12 communicating at its righthand end with the chamber 5 and continuing toward the left communicates with an enlarged cylindrical chamber 13 formed in the brush holding part of the unit. This cylindrical chamber 13 is defined on the lefthand end by an annular shoulder 14 and on the righthand end by a beveled annular shoulder 15. The righthand end of the cylindrical chamber 15 is adapted to receive the dentifrice or tooth paste flowing through the chamber or opening 12 from the refill cartridge 6 and to supply the dentifrice to the brushes 2. For this purpose an opening 16 is formed in the housing surrounding the chamber 13, preferably within the range occupied by the brushes 2 and a small flexible tube 17 as, for example, of rubber has its inner end fastened securely in the opening 16 with its outer end stopping short of the level of the outer ends 2' of the brushes 2. The dentifrice supplied from the refill flows outwardly to a point near the free ends 2' of the brushes 2 which is a desired position of the dentifrice as, for example, tooth paste, for brushing and cleaning the teeth.

The refill cartridge 6 is of tubular shape for fitting loosely within the cylindrical chamber

5, 5'. One end, namely the outer end of the refill cartridge 6 is closed by a plug 18, this plug 18 fitting snugly within the refill tube so as to form a seal against the escape of the tooth paste shown at A. While the plug 18 forms a substantially seal-like closure at the outer end of the refill it nonetheless is movable within the outer tube of the refill to function as a piston for forcing the tooth paste A out through the open or lefthand end of the refill. The piston 18 is actuated to deliver the desired quantity of dentifrice as, for example, tooth paste, to the brushes 2 by means of a rod 19 which is fastened at its inner end in any suitable manner to the piston 18. This rod 19 passes through the chamber 5, elongated chamber 12 and the chamber 13. It is provided with an enlarged cylindrical part 20 at its left end, the latter carrying at its extreme end a finger grip 21 to facilitate the gripping by the fingers to manipulate the rod back and forth during use. The lefthand end of the main body part 3 is provided with a chamber or opening 22 of reduced dimensions as, for example, being of a cross-section to correspond to the enlarged end part 20 and in the particular embodiment shown the part 20 and the chamber 22 are circular in cross-section. This chamber 22 is reduced in cross-section with respect to the cross-section of the chamber 13. When the finger grip is in the closed position shown in Fig. 2 the enlarged part 20 of the rod projects into the chamber 13 with the finger grip 21 being in the form of a head which seals the outer end of the chamber or opening 22 against the entry of dirt, foreign matter, etc. An at-present preferred method of manufacture is to first form the chamber 13 throughout to the extreme lefthand end of the main body part 3 and then after assembly of the parts to insert a sleeve 22' therein to form the reduced chamber 22.

A piston valve 23 is movable back and forth in the chamber 13 to open and close the port or opening 16 through which the dentifrice is supplied to the brush or bristles 2. This piston valve 23 is provided with a central opening to accommodate the rod 19. When the finger grip 20 is pushed inwardly to its innermost position the piston valve 23 firmly seals off the chamber 12 from the port or opening 16. When, however, the finger grip is pulled toward the left, as shown in Fig. 3, to force the dentifrice A into the chamber 13, the pressure of the dentifrice on the valve 23 moves it to the left out of closing position with respect to the port or opening 16 to permit the dentifrice to be forced outwardly through the port 16 and the tube 17 to the outer ends of the brush or bristles 2. In the particular embodiment shown the cylindrical chamber 13 is approximately twice the length of the piston valve 23 and in the position shown in Fig. 3, the piston valve 23 engages the annular shoulder 14. The arrangement should be such as to permit sufficient movement of the piston valve 23 in the chamber 13 to close and uncover the port or dentifrice supply opening 16. The piston valve 23 is thus moved to the open position by the pressure of the dentifrice contained in the chambers 12 and 13. It is moved to the right however to close the port or opening 16 by the main body part 20 of the finger grip whose inner end engages the valve to move it to the position shown in Fig. 2 wherein it rests against the shoulder 15 and securely closes and seals off the port or opening 16.

The fastening connection between the inner

end of the rod 19 and the piston 18 of the refill cartridge is a readily detachable and attachable one. Any suitable readily attachable and detachable connection may be employed as for example a screw threaded connection, a snap fastener connection or otherwise. In the particular embodiment illustrated the piston 18 is made of a flexible material as, for example, rubber, and the connection is generally of the snap fastener type. The rod 19 is provided with a reduced diameter section 25 near its end having a plug 26 at its extreme end, the latter having an inner annular shoulder 26'. The piston 18 is provided with a chamber 27 as, for example, of cylindrical cross-section and in the embodiment shown this chamber 27 is of slightly larger diameter than that of the end 26 of the rod 19. The piston 18 is provided with an opening 28 putting the chamber 27 into communication with the inner part of the casing of the refill 6 and this opening 28 in the embodiment shown is of the same diameter as the reduced portion 25 of the rod 19. The rod 19 is firmly attached to the piston 18 by means of the plug end 26 whose shoulder 26' engages the annular shoulder formed in the lefthand end of the chamber 27 about the opening 28. This construction provides a flexible engaging part of the piston 18 immediately surrounding the reduced portion 25 of the rod which is of sufficient rigidity to retain the end of the rod 19 in the position shown for forcing the dentifrice A out of the refill but it is of sufficient flexibility and resiliency to permit the insertion therethrough of the end 26 of the rod and the removal of the end 26 therefrom by the application of suitable pressure.

Fig 4 illustrates the insertion of a refill 6 within the chamber 5 of the main body part 3. By the mere act of inserting this refill within the chamber 5 while firmly gripping the righthand end of the refill about the piston 18, and by holding the finger grip 20 in fixed position the end 26 of the rod 19 is forced through the opening 28 into the chamber 27 to firmly attach the two parts together in operative relationship. For facilitating this fastening operation the lefthand end of the piston 18 is formed with a tapered countersunk recess 30 whose walls guide the end 26 of the rod 19 to a central position whereby by the application of pressure to the refill and to the finger grip 20, 21 the end 26 is forced through the opening 28 into engaging position.

A depleted cartridge may be readily removed by first removing the cap 4 and then gripping the outer end of the cartridge casing and forcibly withdrawing the casing and the piston 18 from the operative engagement with the inner end of the rod 19. For facilitating this operation it is observed that the outer end of the cartridge casing extends beyond the main body part 3 thereby enabling an easy and firm grip upon the end of the cartridge casing and the piston 18.

The refill cartridge unit is illustrated in Fig. 6. It comprises a tubular casing 31 of any suitable material as, for example, of a suitable plastic or laterally flexible metal material. It is preferably flexible so as to enable a firm grip of the piston 18 for insertion and removal from the unit. The casing 6 is provided with any suitable closing and sealing cap 32 for the end opposite the piston plug end. This closing and sealing cap may be as indicated of any suitable character to form a substantially air-tight seal for the tooth paste or dentifrice A as, for example, this cap 32 may be made of the same material

5

of which the casing 6 is made and after the casing 6 is filled with the dentifrice this sealing cap 32 may be firmly attached to the casing. Ordinarily the sealing piston plug 18 or 18' is sufficient to form a tight seal in the opposite end of the casing 6. If desired, however, a closing cap 33 similar to the cap 32 may be provided for this end also. These caps may be provided with tabs or upset portions 34 for facilitating the removal of the caps 32 and 33.

In the embodiment of Fig. 7 the flexible supply tube 17 is omitted. Otherwise the embodiment is the same as that described above.

In Fig. 5A I have illustrated a modified form of readily attachable and detachable connection between rod 19 and the piston sealing plug 18'. In this embodiment the piston 18' is provided with a recess 36 of any suitable cross-section which stops short of the righthand end of the plug so that the latter still performs the double function of a seal and a movable piston. The righthand end 35 of the rod 19 is provided with a special gripping exterior surface so that when the end 35 is forced into the recess 36 in the piston 18' a tight operating and functioning attachable-detachable connection is provided. In the particular embodiment shown I have illustrated the end of the rod 19 as being provided with teeth-like surfaces or cross serrations so as to cause these teeth to bite into the wall of the recess 36 thereby giving a sufficiently strong grip to enable the operation of the sealing plug 18' as a piston for dispensing the tooth paste or dentifrice A. As described above with respect to the embodiment of Figs. 2 to 5 the refill casing 6 and the sealing plug 18' may be forcibly removed from the rod 19 by first removing the cap 4 and firmly gripping the righthand end of the casing 6 while pulling on the refill casing.

I have described the piston valve 23 as being movable to the open position by the pressure of the dentifrice in the chamber 13 created by the movement of the piston 18, 18' and movable by the enlarged end 20 of the rod 19 to the closing position. However, I have found that where the valve is made of a material to frictionally grip the rod 19 as, for example, of rubber and the like, the valve is movable to the open and closed positions by means of this frictional engagement with the rod 19 without the necessity of the utilization of the pressure of the dentifrice or the enlarged end 20 of the rod.

In the preferred embodiment of the invention a separate refill cartridge 8 is provided as described above but it is understood that certain advantages of the invention are present even though the dentifrice as, for example, the tooth paste is supplied directly to the chamber 5 as, for example, by the emptying of a tube of tooth paste or dentifrice into the hollow chamber 5 after the removal of the closing cap 4, which closing cap may then be inserted in closed position. When the invention is used in this manner the piston 18, 18' needs to be forcibly removed from the end of the rod 19 before the insertion of the dentifrice into the chamber 5 and then re-applied to the end of the rod 19 after the chamber is replenished. In this embodiment an inner lining 6 may be provided if desired in the chamber 5 in which liner 6 the piston 18, 18' moves back and forth.

In Fig. 8 I have illustrated a modification wherein the refill 40 and the piston element 41 are sold separately. The refill is provided with

6

a closing cap 32 similar to the cap described above with respect to Fig. 6 and at the opposite end is provided with a closing cap 33' which is similar to the closing cap 33 of Fig. 6 except that it is provided with an inward extension 42 which, when removed, leaves the end free of dentifrice for the reception of the piston 41. Upon the insertion of the refill in the chamber 5 of the unit the caps 32 and 33' are first removed as described above and then the piston 41 is inserted in the open end of the refill casing 40 whereupon the operating rod 19 is attached thereto as described above. The piston 41 may be provided with a finger grip 43 which projects beyond the right-hand end of the refill casing thereby enabling the ready removal of the piston from the used-up refill after the detachment from the rod 19, ready for insertion in a new refill.

It is observed that the extreme right-hand end of the rod 19 is rounded as indicated at 19' to facilitate at effecting the operative engagement between the rod and the piston.

The materials used in the making of the unit may be of any suitable character. The handle parts 3 and 4 of the unit may be made of a suitable plastic. The rod 19 may be either of metal or a suitable plastic and the piston valve 23 may be of a metal or of suitable plastic material but is preferably of rubber or plastic material.

I claim:

1. A tooth brush dentifrice container unit comprising a main body member having an elongated chamber therein adapted to receive a dentifrice cartridge container having a piston therein, manually operated means passing through the brush end of the unit into said cartridge container and operatively engaged with said piston, a communicating passage from said cartridge to the brush end of the unit and a sealing valve slidably mounted on said manually operated means, said valve in one position closing said passage and in another position opening said passage.

2. In a unit of the character set forth in claim 1 wherein one end of the manually operable means is provided with a readily attachable and detachable operating connection with said piston.

3. A dentifrice refill cartridge for a tooth brush comprising an elongated casing and a closing piston at one end of flexible material which is movable therein to force the dentifrice out of the cartridge, said piston having means for ready attachment to and detachment from manual means for operating the piston and comprising a chamber and axial passage connected thereto for the reception of the end of a manually operated rod in a readily attachable and detachable manner, the walls of the passage being forcibly expanded during attachment and detachment of the rod with the piston.

4. A combined tooth brush and dentifrice supply unit of the character set forth comprising a hollow handle for the reception of a dentifrice refill and a closing cap therefor and comprising manual means and a discharge port at the bristle end of the unit for dispensing the dentifrice to the bristles, said manual means comprising an elongated rod extending into the refill and operatively engaging a piston therein for delivering the required quantity of dentifrice through said port to the bristles and a control valve for said port slidably mounted on the manually operated rod and movable on the rod to

control said port in both the closing and opening operations.

5. A combination tooth brush and dentifrice dispenser comprising an elongated hollow body having a handle end and a bristle carrying end, said bristle carrying end being provided with a discharge port, a tubular dentifrice container within the handle end of the body, a piston in the container for advancing dentifrice toward the bristle carrying end, a rod detachably connected at one end to said piston and extending through said container and through an opening in the bristle carrying end of the body for manual reciprocation by an operator, a valve for said discharge port slidably mounted on said rod and movable by the pressure of the dentifrice to uncover said port when said rod is moved in one direction, said rod being provided with a shoulder for moving the valve to port closing position when the rod is moved in the opposite direction.

6. The combination tooth brush and dentifrice dispenser according to claim 5 wherein said body is internally formed adjacent said discharge port to provide a stop against which said shoulder moves said valve for closing said port.
WILLIAM MARTINO.

References Cited in the file of this patent
UNITED STATES PATENTS

Number	Name	Date
1,451,941	Clum	Apr. 17, 1923
1,768,968	Wallace	July 1, 1930
1,860,911	Trimble	May 31, 1932
1,898,803	Young	Feb. 21, 1933
2,033,197	Kinkade	Mar. 10, 1936
2,053,145	Hamel	Sept. 1, 1936
2,133,295	Hollenbeck	Oct. 18, 1938
2,236,727	Deweese	Apr. 1, 1941