June 21, 1966 G. R. SHERMAN 3,256,894

DISPENSING-TYPE TOOTHBRUSH

Filed May 27, 1964

Fig. 1

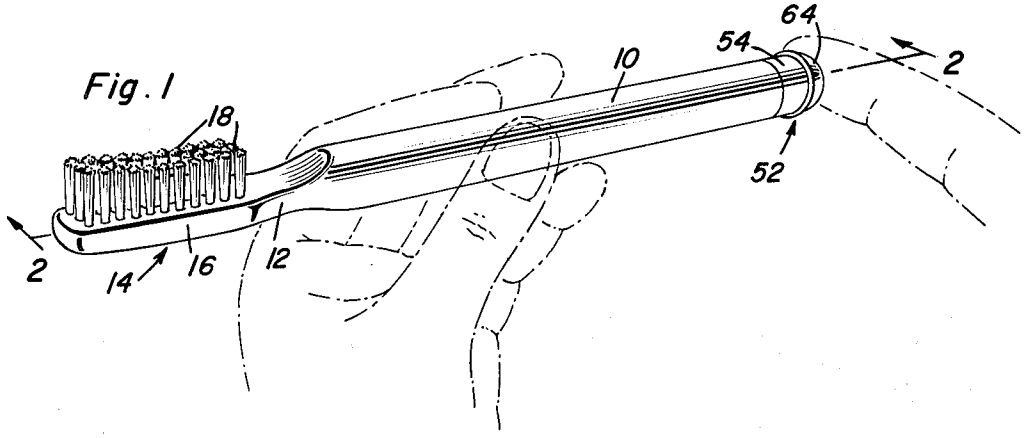


Fig. 2

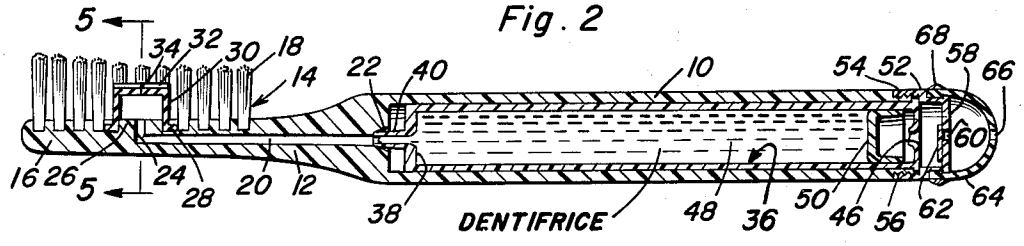


Fig. 3

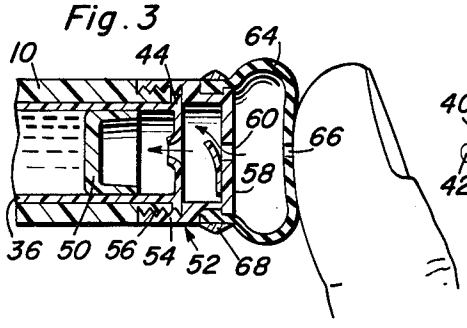


Fig. 4

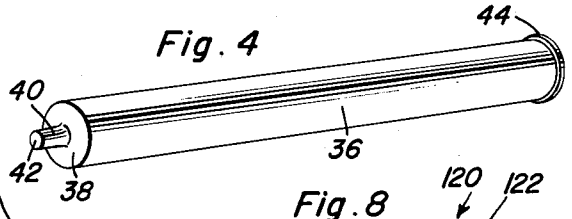


Fig. 8

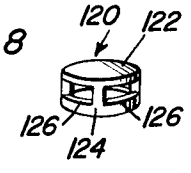


Fig. 6

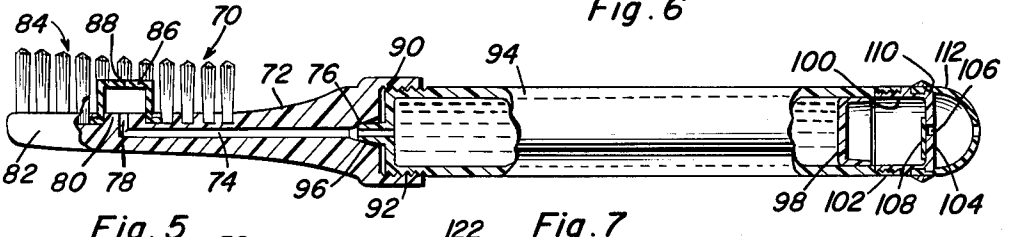


Fig. 5

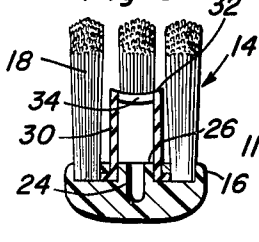
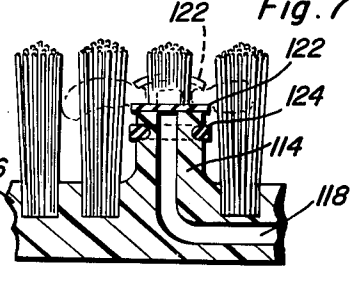


Fig. 7



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DISPENSING-TYPE TOOTHBRUSH

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The present invention relates to a fountain-type toothbrush wherein, as usual, the hollow handle or barrel is provided with the desired dentifrice and wherein the latter is forcibly dispensed therefrom through a passage leading to a bristle-equipped head and wherein the barrel and also the head have improved features which result in the production of a toothbrush which better and more satisfactorily serves the purposes for which it is intended.

One improvement resides in the use of air as a force and wherein the air column is placed under pressure by way of a simple and expedient resilient finger-depressed cap. To the end desired a simple bulbous rubber or an equivalent cap is operatively mounted on an end portion of the barrel-like handle whereby upon exerting finger pressure thereon and depressing the same it acts on the trapped air which in turn controls a check valve whereby to in this manner act on a follower in the dentifrice holder or cartridge to progressively express the dentifrice for use.

The end of the handle or barrel which carries the normally expanded finger-depressed bulb or cap is further novel in that the cap is mounted on a fitting and said fitting is provided with a simple check valve which is arranged to focus the air under pressure in a manner to not only open the check valve but to act on the dentifrice plunging and expelling cup.

The concept also comprehends the adoption and use of a barrel-like handle wherein the same serves to accommodate an insertable and removable dentifrice containing cartridge, preferably one which has a nipple at the discharge end which can be severed with a suitable nipping tool or implement and which is provided at the opposite end with a flanged puncturable member or diaphragm and also provided interiorly thereof with the air actuated dentifrice plunging cup.

Further novelty is predicated on the construction of the head which is not only provided with suitable bristles but which has a dentrifrice discharging orifice or outlet which communicates with an applicator. One form of the applicator comprises a slitted rubber or equivalent applier which preferably has a dished end which forms a sort of a cove and which latter assists in more evenly distributing the dentifrice of the adjacent bristles while at the same time guarding against injury in a situation where the user applies the bristles of the brush too vigorously to the teeth and gums.

Then, too, novelty is predicated on separate head and handle portions wherein the handle portion is preferably constructed with a screw-threaded socket member to accommodate a screw-threaded end on an attachable and detachable dentifrice-filled cartridge, said cartridge being provided at one end with the aforementioned valved pressurizing cap or bulb.

Further, novelty is based on a bristle-equipped head wherein the discharge end of the passage cooperates with a projecting neck, said neck being peripherally grooved to facilitate the attachment thereto of a novel pressure responsive valve, that is a valve which is normally closed to guard against leakage or drippage and which comes into play and is forced out to an open discharging position by the pressure of the dentifrice which is forcibly ejected for use.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a view in perspective of a fountain toothbrush constructed in accordance with the principles of the present invention showing one embodiment and approximately how it is to be held and used for charging the bristles with dentifrice or toothpaste as the case may be;

FIGURE 2 is a view on a slightly enlarged scale with parts appearing primarily in section and wherein said view is taken on the plane of the central section line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged view in section showing the bulb or cap-equipped end of the handle or barrel (see FIG. 2 at the right) and illustrating how one goes about pressing air from the cap-like bulb in a manner to open the check valve and to force the air column into the cartridge to act on the cup-like follower or plunger;

FIGURE 4 is a view in perspective of the insertable and removable cartridge;

FIGURE 5 is an enlarged detail view taken on the plane of the section line 5—5 of FIGURE 2;

FIGURE 6 is a view in section and elevation similar to FIGURE 2 but showing a modified construction wherein the cartridge takes the place of and serves as a handle in addition to a holder and dispenser;

FIGURE 7 is an enlarged view showing a modified adaptation and further showing the pressure responsive control valve; and

FIGURE 8 is a view in perspective of the valve by itself.

Reference will be made first to FIGS. 1 to 5, inclusive. In this form or embodiment of the invention the hollow cylindrical handle or barrel is denoted at **10** and is of suitable material and approximately of the size shown in FIG. 1. The forward end portion of this handle or barrel merges into and is integral with a shank **12** which in turn is fashioned into an elongated rectangular head denoted generally at **14**. This head includes a brush back **16** of common form provided on its brushing surface with appropriate bristles **18**. As shown in FIG. 2 there is a longitudinal bore **20** which constitutes a passage and which is provided at the righthand end with an enlarged counterbore **22**. The opposite end of the bore is laterally directed as at **24** and constitutes a discharge orifice opening through a generally rectangular boss **26**. This mound or boss **26** serves to accommodate the flanged end portion **28** of the elongated hollow elastic applicator **30**. The top portion of the applicator is dished or otherwise formed to provide a cove **32** at the center of which is a normally closed discharge slit **34**. Thus the slit and applicator may be interpreted as a normally closed valved dispensing nipple-type applicator.

The insertable and removable cartridge is of an elongated cylindrical form and is denoted generally at **36** and one end portion **38** is fashioned with a piloting and positioning nipple **40**. The end **42** is normally closed but can be clipped off with a pair of scissors or a suitable instrument in order to open up the nipple before it is fitted telescopingly into the funneling inlet **22**. The opposite end portion is provided with an endless outstanding flange **44** which end is suitable punctured as at **46** when it is to be used. On the interior and in addition to the dentifrice **48** a cup-like follower **50** is provided. This follower acts as a dentifrice expressing plunger.

In carrying out this form of the invention novel manually actuatable means is provided and this comprises a fitting or adapter **52** (FIG. 3) which has a screw-threaded portion **54** which is screwed on the reduced neck **56**. This adapter also embodies a disk-like end portion **58** having an air port or orifice **60** which is normally closed by

a flap-type check valve **62** which is suitably mounted on one side in a manner to cover the port. The port and valve are aligned with the punctured air intake **46** in order to deliver air under pressure into the cup and to force the cup in a step-by-step manner against the dentifrice and to in turn express the dentifrice through the discharge neck **40** into the dispensing passage **20** and accordingly into the bristles by way of the normally closed pressure opened applicator **30**. It will be noticed that to accomplish the desired result a simple mechanical pump, as it were, is provided and this comprises a semi-spherical rubber or an equivalent resilient bulb **64** having a vent **66** and also having a portion **68** which encompasses the adapter and is held seated by an associated assembling and retaining band, all as shown in FIGS. 2 and 3 in particular.

In practice with this form of the invention the original purchase would include the complete ready-to-use assemblage of parts illustrated in FIGS. 1 and 2 in particular. This is to say the cartridge **36** containing the dentifrice is already in place in the hollow portion of the barrel or handle **10**. It is to be assumed that the end **42** of the nipple has been cut off and that the nipple has been forced into the intake seat **22** provided therefor. Also the adapter **52** with its finger pressure operaed bulb is in place. By placing one's finger over the port **66** and exerting pressure on the bulb **64** in the manner shown in FIG. 3, the air which was trapped in the bulb is now forced through the port **60** to open the check valve and the pressurized air column passes through the punctured hole **46** and acts on the plunger **50** to force it in a step-by-step manner with the result that the plunging action thus achieved puts the dentifrice under pressure and forcibly expresses it through the passage **12** and into the applicator for dispensing into the bristles of the brush. When the supply of dentifrice in the cartridge has run out the adapter with the bulb is screwed off, the empty cartridge is removed and replaced with a new one. Then the bulb and its adapter is returned to the position shown in FIG. 2 and also in FIG. 3.

With reference now to the modification shown in FIG. 6 the head unit is denoted as an entity by the numeral **70** and comprises a shank **72** with a passage **74** with an enlarged funnel-like intake **76** at one end and a discharge orifice **78** at the opposite end. Here again a neck or boss is provided at **80** this being formed as an integral part of the backing **82** carrying the brush bristles **84**. The applicator, of compressible rubber, is denoted at **86** and is mounted on the boss and cooperates with the orifice **78** and has a normally closed valving or discharge slit **88** which can be opened up when the proper pressure is applied thereto. The slitted end of the applicator can be either flat, that is planar, or dished to form the aforementioned recess or cove shown in FIG. 5, this being an optional phase of the concept. The opposite or right-hand end portion of the shank is provided with a screw-threaded socket member **90** to accommodate the screw-threaded end portion **92** of a handle-forming dentifrice containing cartridge **94**. The nipple in this instance is denoted at **96** and fits into the intake **76**.

In this instance the follower or cup is denoted at **98**. The adapter head comprises a neck **100** which is screwed into the screw-threaded end portion **102** of the barrel whereby to thus mount the adapter. Here again the adapter comprises a disk portion **104** having a port **106** with a valve **108** closing said port, the flanged end **110** being provided with the band attached semi-spherical resilient bulb **112** which functions in the manner shown in FIG. 3. The only difference in this construction and arrangement is in the manner in which the adapter is threadedly connected to the barrel. Otherwise the finger-depressed bulb or cap means is the same in construction.

There may be instances where the applicator shown in FIGS. 1 and 6 might not be used. This is to say there may be an instance wherein the modified form shown in FIGS. 7 and 8 is preferred. Here a neck **114** is provided on the brush head **116**, said neck receiving the supply of dentifrice through the passage **118**. The end of the neck is provided with a rubber or an equivalent valve **120** of the construction shown in FIG. 8 and which comprises a diaphragm or disk **122** having an attaching elastic band **124** which is fitted around the grooved portion of the neck in the manner shown and which is provided with circumferentially spaced discharge openings **126**.

It will be obvious in this arrangement that the dentifrice when it is put under pressure and squeezed through the passages **118** will open up the valve **120** in the manner illustrated in phantom lines in FIG. 7 and will thus allow the dentifrice to be squeezed out and delivered to and distributed among the brush bristles.

It is within the purview of the over-all concept that the hereindisclosed brush be structurally and functionally modified so that it can be carried with nicety in one's coat or shirt pocket in a manner, similar, for example to a fountain pen. To this end a cap would be fitted removably over the brush head and, in addition, a pocket clip would be provided at the pressure end or elsewhere, as the manufacturer would decide.

It is also a matter of significance to take into account a fountain-type brush combination characterized by a dentifrice-charged handle (FIG. 6) with one end screwed or otherwise detachably joined to the bristle-equipped head (one unit) and wherein the pressure responsive valved means (a second self-contained unit) is readily attachable and detachable. Accordingly, with such a construction and orientation of the several units the handle, as such, constitutes a disposable and replaceable separately purchasable cartridge or unit and the head and pressure valved means or unit can be used over and over.

It is believed that a careful consideration of the specification in conjunction with the views of the drawing will enable the reader to obtain a clear and comprehensive understanding of the construction, the features and advantages and the manner of using the embodiments of the invention herein shown. Accordingly, a more extended description is regarded as unnecessary.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A fountain-type tooth brush comprising a shank having a head, said head embodying a backing member provided with bristles, said shank and backing member having a dentifrice passage extending therethrough, said passage having a dentifrice discharge orifice at one end proximal to said bristles, also having a raised apertured boss, an applicator having a flanged end portion embracing and cooperatively attached to said boss, said appplicator being hollow and having an end portion which is dished and provided with a normally closed expansible and contractible slit constituting a valve, and handle means attached to said shank in cooperative alignment with said passage.

2. The structure defined in claim **1** and wherein the dentifrice intake end of said passage is enlarged, said handle means having a dentifrice containing and supplying cartridge including a discharge nipple having a discharge end portion fitting telescopically into the intake end of said passage.

3. A toothbrush of the class described comprising a handle-equipped bristle head having a backing member with a discharge neck, said neck projecting in relation to adjacent bristles and having an axial discharge end

and a peripherally grooved end portion, a flexible disk normally spanning and covering the discharge end, said disk having an elastic attaching and retaining band removably mounted in said groove.

4. A toothbrush of the class described comprising a handle-equipped bristle head having a backing member with a discharge neck, said neck projecting in relation to adjacent bristles and having an axial discharge end and a grooved end portion, a flexible disk normally spanning and covering said discharge end, said disk having an elastic attaching and retaining band mounted in said groove, said band being provided with associated circumferentially spaced discharge openings which serve to discharge dentifrice therethrough, that is, when the disk has been placed under pressure and is forced away from the discharge orifice in a manner to uncover and open said discharge openings.

5. A toothbrush comprising a bristle-equipped head having a valved discharge orifice and an associated flexibly resilient applicator cooperable with the orifice and also with the bristles, said applicator having a valve slit which is normally closed but is pressure-responsive and openable when properly subjected to pressure, a hollow handle, said handle providing a receiver, and a dentifrice supplying cartridge insertably and removably fitted into said receiver, said cartridge having an openable nipple at a discharge end, being provided at its opposite end with a puncturable air intake diaphragm and being internally provided with a reciprocable air pressure responsive cup, said cup being opposed and spaced from said diaphragm constituting a follower and having the function of a dentifrice expressing plunger, and a finger actuated pressure responsive bulb mounted on said opposite end and adapted to generate a pressurized column of air between itself and said diaphragm capable of operating said plunger, said bulb having a finger openable and closable air venting port.

6. A toothbrush comprising a bristle-equipped head having a valved discharge orifice and an associated flexibly resilient applicator cooperable with the orifice and also with the bristles, said applicator having a valve slit which is normally closed but is pressure-responsive when opened, a hollow handle joined at one end to said head, the other end of said handle being open, and a cartridge fitted through said open end and telescoping removably into said handle, said cartridge having an openable nipple at its discharge end and being provided at its opposite end with a puncturable diaphragm adapted to provide a pressurized air intake port, an imperforate cup mounted for translation in said cartridge and constituting an air pressure responsive follower and providing a dentifrice contacting and expressing plunger, an adapter connected to the rearward end of said handle, said adapter having an intake opening and an associated normally closed air pressure responsive check valve coacting with said opening, and a pressure responsive elastic bulb attached to said adapter and cooperable with said valved air intake opening.

7. A fountain-type toothbrush comprising a bristle-equipped head having a passage for supplying dentifrice to the bristles, said passage provided at its dentifrice intake end with an internally screw-threaded socket member, a handle having a screw-threaded end removably screwed into said socket member, said handle being adapted to contain, store and dispense a dentifrice, said handle being provided at said screw-threaded end with an axial dentifrice dispensing nipple, said handle being further provided at a rearward end with a screw-threaded neck, an adapter having a screw-threaded portion connected with said neck and also having a disk provided with an axial air inlet port, said disk provided on one side with a normally closed pressure opened flap-type check valve, a resilient bulb operatively mounted on said adapter for cooperation with said disk and having a finger controlled opening therein constituting an air intake and discharge port, and an imperforate cup slidingly mounted in said handle with one end contacting the dentifrice in a manner to express the same, said cup being spaced from said disk to provide an intervening air chamber wherein pressurized air is generated to exert pressure against and operate said cup.

8. A fountain-type toothbrush comprising a shank having a head, said head embodying a backing member provided with bristles, said shank and backing member having a dentifrice passage extending therethrough, said passage having a discharge orifice at one end proximal to said bristles, also having a raised boss, an applicator having a flanged end portion embracing and attached to said boss, said aplicator being hollow and having an end portion which is dished and provided with a normally closed expansible and contractible slit constituting a valve, and handle means attached to said shank in cooperative alignment with said passage, the intake end of said passage being enlarged in dimension, said handle comprising a barrel charged with ready-to-use dentifrice and having a delivery nipple at the forward end fitting telescopically and removably into the intake end of said passage, said handle constituting a self-contained disposable cartridge and being replaceable, a finger actuated bulb having a finger controlled vent, a valved adapter for and on which said bulb is operatively mounted, said adapter and bulb constituting a self-contained unit, and means on the rearward end of said barrel whereby said adapter is separably connectible thereto and whereby said handle when its purpose has been served can be thrown away and a new handle put in its position.

9. In combination, a first self-contained intact unit comprising a fountain-type brush head having a head member equipped with bristles and a complemental shank, said shank having a dentifrice delivery passage extending therethrough for supplying dentifrice to the bristles, a second unit comprising a dentifrice filled barrel for containing, storing and dispensing the dentifrice and also providing an elongated brush handle, said barrel being provided at a forward end with a discharge nipple and connecting means whereby said nipple may be communicatively joined with said shank for coaction with said passage, the rearward end of said barrel being screw-threaded to provide an attaching neck for an adapter, and being provided interiorly with a cup-like plunger which when subjected to pressure on its rearward face serves to dispense the dentifrice through said nozzle, and a third unit embodying a finger actuated bulb having a finger controlled vent and a valved adapter on which said bulb is operatively mounted.

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