

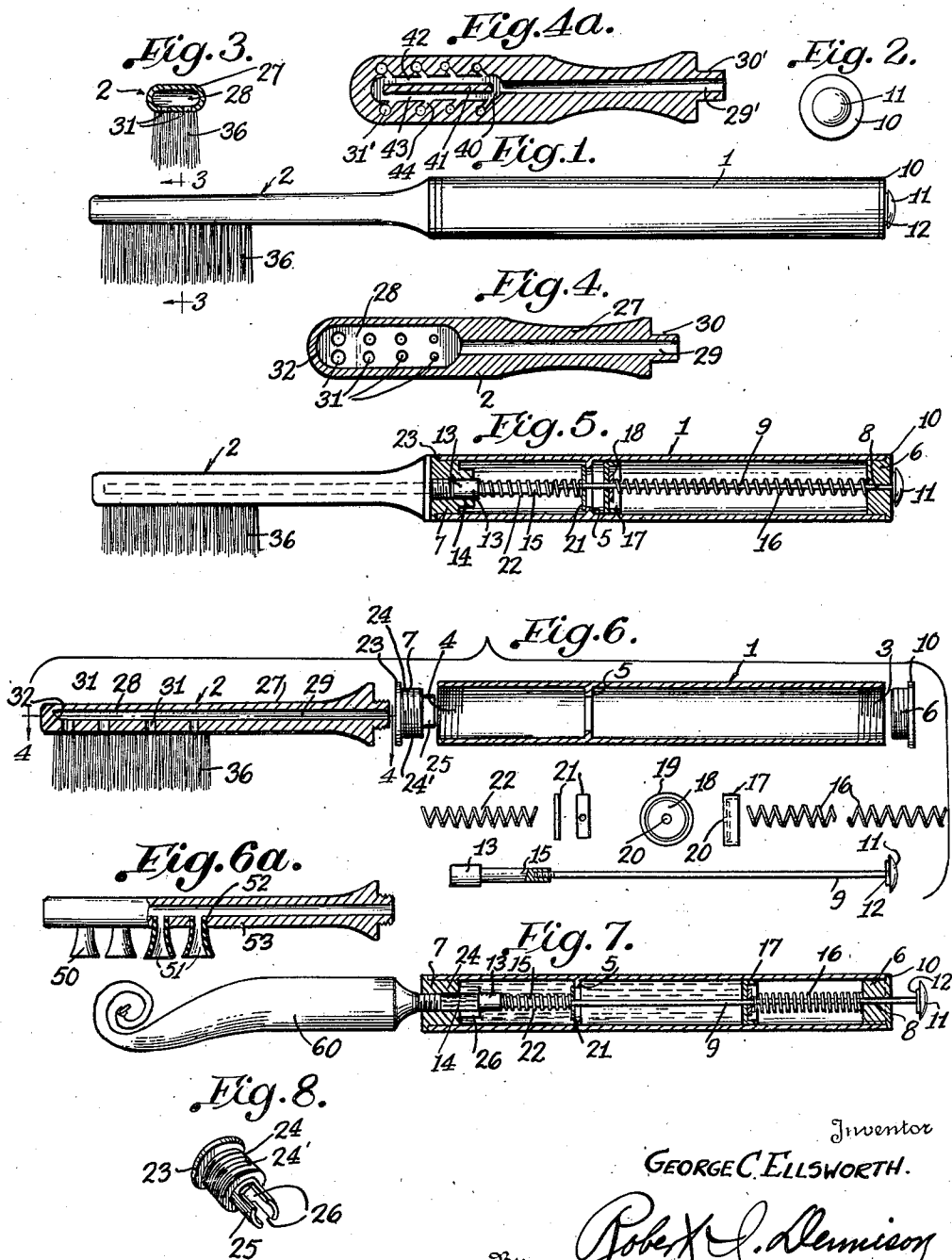
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DISPENSING DEVICE

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DISPENSING DEVICE

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2 Claims. (Cl. 221-102)

The present invention relates to improvements in brushes and has reference more particularly to an improved fountain brush.

One of the objects is to provide a fountain brush wherein the handle forms a reservoir to receive the fluid sought to be applied by the bristles of the brush and wherein a means is provided to apply pressure to the fluid to force the same into the brush head.

A still further object resides in the provision of a device of the above-mentioned character that can be readily and easily assembled or disassembled for cleaning purposes or repair and for permitting the interchanging of various brush heads.

A further and important object is to permit the present invention to be used for massaging the gums with or without the application of a suitable massaging or cleansing agent.

Another object is to provide means for effecting a uniform discharge of the fluid from the brush head onto the bristles of the brush.

Further objects and advantages will be understood from an inspection of the accompanying drawing and will be more fully set forth in the following detailed description of the device forming the subject matter of this invention.

In the drawing the same reference characters refer to like parts in the several views and in which:

Fig. 1 is an elevation of the assembled brush.

Fig. 2 is an end view of the handle member.

Fig. 3 is a sectional view of the brush head taken on the line 3-3 of Fig. 1.

Fig. 4 is a longitudinal sectional view of one form of a hollow brush head.

Fig. 4a is a longitudinal sectional view of a modified form of brush head.

Fig. 5 is a view similar to Fig. 1, showing the handle in section.

Fig. 6 is an exploded view showing the various parts of the brush in disassembled relation.

Fig. 6a is a partial longitudinal sectional view of a modified type of brush head, used for massaging purposes.

Fig. 7 is a partial longitudinal sectional view of the handle showing a means whereby the same can be charged or loaded.

Fig. 8 is an isometric view of one of the end plugs which forms a portion of the valve means.

Throughout the specification and claims the term brush is used as a generic term to include all types of attachments which may be applied to the handle, such as a massager, a bristle brush, a liner, etc. The term fluid is used in its generic

sense to include all such substances as liquids, pastes or powders, the interchangeable use of which is contemplated by this invention.

The device comprises two main elements, a hollow handle member 1, and a head member 2, both of which may be formed of any suitable substance, such as a plastic resinous compound. The handle 1 is open at its ends as shown at 3 and 4 respectively. Spaced from the opening 4 an internal shoulder 5 is provided for a purpose to be hereinafter described. Both ends 3 and 4 are threaded or otherwise adapted to receive in fluid-tight relationship the closure members or plugs 6 and 7. The plug 6 is provided with an aperture 8 through its center adapted to receive a piston rod 9, and has a shoulder 10 formed thereon which, when assembled on the handle member 1 forms a continuation thereof and prevents any fluid contained in said handle from leaking past the plug. Suitably secured to the rear end of the piston rod 9 is a rounded finger grip or knob 11 which knob has a shoulder 12 formed on the inner face thereof to space the knob 11 from the outer face of the plug 6 and to thereby make easier the retraction of the rod 9 by inserting the fingernail between the shoulder 10 and knob 11.

Suitably secured at the forward end of the rod 9 is a piston 13 which is adapted to project into an opening 14 formed in the plug member 7. The openings 8, 14, in the plugs 6, 7, respectively, act as bearings to support the rod 9 for longitudinal sliding movement within the handle member. The rod 9 is slightly enlarged rearwardly of piston 13 to form an abutment member 15 which is adapted to contact a stop member 21 to prevent complete withdrawal of the piston 13 from the opening 14. The member 21 is slidably mounted on the rod 9 forward of the shoulder 5 and is so formed that fluid may flow in both directions past said member 21. A spring 22 encircles the rod 9 at its forward end and acts between the stop 21 and piston 13 to at all times urge the piston 13 into the opening 14 formed in the plug 7.

A plunger member 17 is slidably mounted on the rod 9 adjacent its rear end. The plunger member consists of a stiff washer 18 and a flexible piston 19 suitably secured to said washer. The washer 18 has an opening 20 therein of a diameter sufficiently large to insure free sliding movement of the plunger 17 on rod 9 but preventing substantially all leakage of the fluid into the rear portion of the handle member 1. The piston 19 encases the washer 18 and forms therewith a fluid tight plunger. A coil spring 16 en-

circles the rear portion of rod 9 and acts between the inner face of plug 6 and the plunger 17 to constantly urge the plunger to the forward end of the handle 1.

The plug member 7 is provided with a longitudinal opening 14 and comprises an outer shoulder 23, a body portion 24 and a reduced inner end portion 25.

The outer shoulder 23 forms a continuation of the handle member 1 when assembled therewith and acts to prevent leakage past the plug 7. The body portion 24 is threaded as at 24' to fit within the forward opening 4 in the handle member 1. The inner, reduced portion 25 is provided along its length with a series of diametrically opposed slots 26 which provide a passageway to permit the fluid to flow into or out of the handle 1 through the opening 14. Although I have shown only two such slotted openings 26, it is obvious that any desired number may be used.

When the plug 7 is assembled with the handle member 1 it acts as one portion of a valve, the other portion of which is formed by the piston 13 which slidably engages in the opening 14 and forms with the inner walls thereof a fluid tight connection.

The brush head 2 consists of a body 27 which is formed with a cavity 28 at its forward end, said cavity being connected, by means of a longitudinal opening 29 with the reduced neck portion 30, which neck portion is adapted to fit snugly into the outer end of the bore 14 of plug 7. Communicating with the cavity 28 is a series of openings 31 formed in the under portion of the body 27. The openings 31 are of varying diameters and are preferably disposed in symmetrical rows longitudinally and transversely of the head 2, the smaller openings being placed toward the rear of the head 2 and the diameter increasing toward the forward end of the head whereby a uniform discharge of fluid is accomplished. As the fluid progresses through cavity 28 the pressure diminishes due to the fluid passing through the first of the openings 31, which pressure decrease is compensated for by the increase in the size of the openings 31. The openings 31 extend into the bristles 36 to allow the fluid to be discharged thereon. The extreme forward end of cavity 28 is defined by an upwardly sloping wall 32 which extends to the forwardmost of the openings 31 and is provided to insure all of the fluid passing through the openings 31 and onto the bristles 36.

In Fig. 4a is shown a modification of the head member. In the modification a cavity 40 is formed at the forward end of the head which communicates with the reduced neck 30' by a longitudinal bore 29'. Openings 31' are provided in the forward portion of the head similar to openings 31 above described. Within the cavity 40 there is formed a longitudinal baffle 41 which serves to divide the cavity into two channels 42, 43 of equal size. Openings 31' communicate with channels 42, 43 by means of corridors 44 which are inclined rearwardly to provide easier flow of fluid from the channels 42, 43 into the openings 31'. Corridors 44 and openings 31' increase in size from the rear to the front of the head in a manner similar to and for the purpose set forth in the description of the openings 31.

In Fig. 6a is shown a further modification of a head attachment. In this modification the head can be formed as shown in either Fig. 4 or Fig. 4a. In place of the bristles 36, there is substituted massaging members 50. The members 50 are formed of any suitable flexible material such

as rubber, and consist of hollow cone shaped elements having longitudinally disposed openings 51 therethrough. The cones 50 are adapted to have their reduced end portions 52 disposed and held in the openings in the under face of the body 53 of the head. The openings 51 in the cones 50 communicate with the cavity in the body to provide free passage of fluid to the massage elements.

To charge the handle member 1 a collapsible tube 60 containing a suitable fluid is inserted into the outer end of the opening 14 in the plug 7 and pressure applied to said tube 60 to force the contents thereof through the opening 14 in the plug 7. The fluid entering the opening 14 acts against the piston 13 to force the same rearwardly against the action of spring 22. As the piston 13 is forced rearwardly it uncovers the slotted openings 26 allowing the fluid to pass from the opening 14 in plug 7 through the slots 26 and into the forward end of the hollow handle member 1. Due to the restricted size and shape of the stop 21, the fluid is allowed to pass rearwardly beyond the internal shoulder 5 and into the rear portion of the handle member 1. Continued pressure on the tube 60 forces the plunger 17 rearwardly and thereby compresses spring 16. When pressure is released on tube 60, the spring 22 automatically forces piston 13 into the opening 14, the forward end of the piston passing beyond the forward ends of slots 26, thereby closing same and preventing any undesired flow of fluid through the opening 14 in plug 7.

After the handle member 1 is fully charged, the tube 60 is removed and a suitable head member inserted into the opening 14 in the plug 7. When it is desired to use the device, the knob 11 is pulled rearwardly by inserting the fingernail in the groove provided by the abutment 12 on the knob 11 and the rear end of plug 6. The rearward movement of knob 11 retracts the piston 13 in opening 14 which uncovers slots 26. The plunger 17 moves forward under pressure from the spring 16 and forces the fluid through the slots 26 and opening 14 into the cavity in the head member and thence through the openings 31 onto the bristles 36. When a desired amount of fluid has been forced onto the bristles 36, the knob 11 is released, which allows spring 22 to force the piston 13 forwardly into the opening 14 and stop the flow of the fluid. From the above it will be seen that a user of the device can accurately control the amount of fluid which is discharged onto the bristles 36. The forward movement of the piston 13 under the force of the expanding spring 22 places an additional pressure on the fluid being ejected from the handle 1 to the brush head 2 by the plunger 17. This additional force assures a complete distribution of the fluid to all parts of the cavity 28 in the head 1 and thus further assures an equal distribution of the fluid onto the bristles 36 through the openings 31.

While I preferably intend to use a liquid dentifrice in conjunction with my fountain tooth brush, it is to be understood that I do not wish to limit myself to such specific use, as tooth paste or tooth powder can equally as well be also used.

A fountain brush of the above mentioned character will at all times be positive and efficient in its operation, and further can be manufactured at a very low cost.

While I have particularly described the elements best adapted to perform the functions set

forth, it is obvious that various changes in form, proportion, and in the minor details of construction may be resorted to without departing from the spirit of the invention and the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A dispensing means including a tubular casing, a closure means for each end of the casing, one of said closure means comprising three portions, the intermediate portion being dimensioned to snugly fit the interior wall of said casing and being smaller in cross sectional area than the outer portion but larger in cross sectional area than the inner portion, all of said portions having registering uniform bores extending therethrough, the inner portion having a transverse slot therein communicating with said bore, a piston slidable in said bore and adapted to be projected beyond said slot, said piston having a reduced portion, an operating rod longitudinally disposed in said casing and secured to the reduced portion of said piston, an abutment integral with the inner walls of said casing, said abutment being so constructed and arranged that a fluid in said casing is substantially unobstructed in its flow therepast, a narrow stop member

freely slidable on said rod and adapted to contact said abutment, a resilient member disposed about the reduced portion of said piston and extending between said piston and said stop member to force said piston into said bore beyond said slot, said reduced portion on said piston adapted to contact said stop member to prevent complete withdrawal of said piston from said bore.

2. In a dispensing means, a casing, a control assembly including a cylinder arranged at one end of the casing, a piston operable in the cylinder, an elongated reduced portion secured to said piston, a rod secured to the end of the reduced portion and being of smaller cross sectional area than said reduced portion, a stop member slidably received on said rod, an abutment in the casing adapted to be engaged by said stop member, resilient means disposed about said reduced portion and extending between the piston and said stop member and constantly urging said piston into said cylinder, said reduced portion being adapted to contact said stop member to prevent the complete withdrawal of the piston from said cylinder.

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