May 5, 1942. C. J. CHRISTENSEN ET AL 2,282,034

DISPENSING CONTAINER

Filed May 17, 1941

FIG-1-

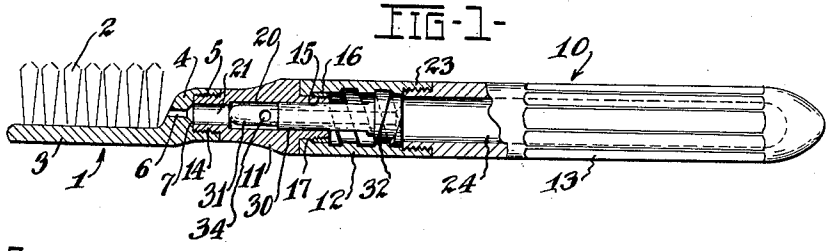



FIG-3-

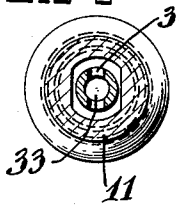



FIG-2-

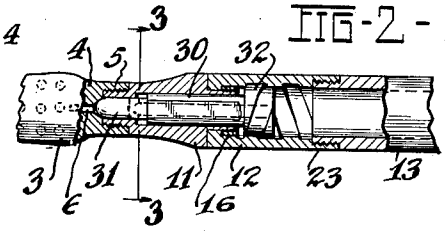



FIG-4-

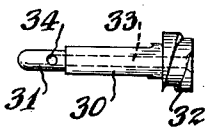
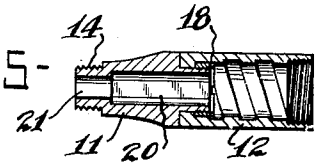



FIG-5-



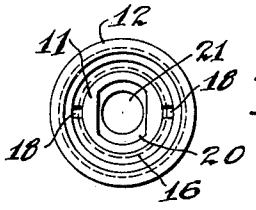




FIG-6-

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# UNITED STATES PATENT OFFICE

2,282,034

## DISPENSING CONTAINER

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Toledo, Ohio

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2 Claims. (Cl. 221—79)

This invention relates more particularly to a toothbrush having a liquid dentifrice, or to a scrubbing brush having a liquid soap, in the handle portion thereof together with means for controlling the discharge of the liquid to the bristle portion of the brush.

The primary object of the invention is the provision in a brush of this character of simple, improved and easily operable means controllable by a rotation of the handle relative to the brush head to operate a plunger type of valve both to open and close the communication between the handle chamber and discharge passage therefrom and to effect a positive ejection of liquid from said passage, as well as to clean accumulated matter from its walls during the passage closing stroke of the plunger.

Further objects and advantages of the invention will be apparent from the following detailed description and from the accompanying drawing, in which—

Figure 1 is a central longitudinal section of a brush embodying the invention, with the control valve in open position and with parts in full; Fig. 2 is a fragmentary section similar to Fig. 1, with the valve in full and in closed position; Fig. 3 is an enlarged cross-section on the line 3—3 in Fig. 2; Fig. 4 is a side view of the valve member; Fig. 5 is a central longitudinal section of the valve enclosing members of the brush, with the valve removed; and Fig. 6 is a rear end view of Fig. 5.

Referring to the drawing, 1 designates a brush head, in the present instance of the type commonly used in toothbrushes, and including tufts of bristles 2 on a back 3. The inner or handle end of the back 3 is provided lengthwise of the brush, with a short shank or extension 4 broadened relative to the back 3 in the plane of the bristles 2, and provided in its free end with a threaded socket 5 centrally from the bottom of which extends a restricted discharge passage 6. The outer end of this passage terminates adjacent to the inner end of the set of bristles 2, and its inner end wall is provided, in the present instance, with a tapered countersunk valve seat 7.

A handle or body member 10 is attached at its inner end to the shank 4 of the brush back and comprises, in its present embodiment, a nipple 11 at its inner end, a sleeve 12 rotatably mounted on the nipple, and a barrel part 13 fixed to the sleeve.

The nipple 11 has its forward end, or that adjacent to the brush head, reduced to form a stud 14 for threading into the shank socket 5 to firmly discharge the two parts. The nipple enlarges towards its rear end to a cross-sectional size corresponding to that of the sleeve 12, and is provided at such end with a reduced stud part 15 for entering the adjacent end of the sleeve and on which the sleeve is intended to rotate. A nut 16 is threaded on the stud 15 within the sleeve 12 and engages a shallow internal flange 17 thereon to retain the nipple and sleeve in relative rotatable assembly. The outer or rear end of the nut 16 is cross-notched as at 18 (Figs. 5 and 6) to facilitate engagement by a screw driver inserted through the opposite end of the sleeve.

The nipple 11 is provided axially therethrough with a bore forming the large rear end portion 20 and the restricted front end portion 21, with the diameter of the latter larger than the shank passage 6, so as to expose the tapered valve seat 7 thereto, as shown.

The barrel 10 has its inner end reduced and threaded into the rear end of the sleeve 12, as shown at 23, with one tightly seating against the other, so that when assembled they constitute the rotatable part of the handle which is mounted on the nipple 11. These rotatable handle parts form the chamber 24 in which the liquid to be dispensed is stored. The chamber 24 is filled by liquid dentifrice, soap, or the like, depending on the use to which the brush is to be put, by unscrewing the part 13 from the sleeve 12 and then pouring the liquid into the inner open end of the part 13.

The valve for controlling the discharge of liquid from the handle to the brush head includes a stem part 30 fitting the large portion 20 of the nipple bore and having at its forward end a reduced plunger portion 31 for fitting the reduced portion 21 of said bore and adapted to seat at its free end against the seat 7 at the inner end of the discharge passage 6 when the valve is at the limit of its forward or seating stroke.

The stem 30 is provided at its rear end with a peripherally threaded head 32 which, except as hereinafter noted, closes the passage through the sleeve 12 and has threaded engagement with its inner wall. Such threaded engagement is of the quick movement type so that the reduced plunger portion 31 of the valve will be withdrawn from the portion 21 of the nipple bore by a comparatively slight relative turning of the handle 10. In the present instance, the full length of movement is imparted in one direction or the other to the valve by giving the handle substantially a full turn relative to the nipple 11. The valve is pre-

vented from turning with the handle during such movement by causing the stem portion 30 and bore portion 20 to interengage in out-of-round fashion, as shown in Figs. 3 and 6. In the present instance, this is accomplished by flattening two opposed sides of the bore portion 20 and correspondingly flattening the sides of the stem 30. It is thus apparent that a turning of the handle 10 in one direction relative to the brush head will effect a rapid movement of the valve from full open to full seated position, and vice versa.

The valve stem 30 is provided lengthwise therethrough with an axial passage 33 which is open to the liquid chamber 24 of the handle through the head 32 and has its opposite or forward end extended into the inner end portion of the plunger part 31 and provided therein with one or more lateral outlet openings 34.

It is apparent that when the valve is in retracted position as shown in Fig. 1, the forward end portion of the bore 20 and its restricted outlet portion 21 are in communication with the liquid storage chamber 24 through the valve passage 33 and side ports 34, thus permitting liquid from the chamber to be discharged through the bore of the nipple 11 and the restricted discharge passage 6 in the brush head shank. Upon a forward movement of the valve member the plunger part 31 thereof enters and closes the restricted bore 21 of the nipple 11 and at the same time forcefully ejects liquid therefrom through the passage 6 to the brush bristles and also cleans the wall of the bore 21 of any accumulated liquid. This latter action insures maintaining the discharge passages 21 and 6 open when the valve plunger is retracted, so that the discharge of liquid therefrom will not be interfered with. This is an important feature in connection with dispensing of liquid dentifrices, soap, or the like, as the tendency of such liquids when subjected to the air is to congeal and accumulate on the walls of the passages.

In the use of the invention, liquid is caused to flow by gravity into the nipple member of the handle when the valve plunger is in retracted position, and such liquid, if it does not flow freely from the handle through the restricted discharge passage in the brush head, is caused to be forcefully ejected from the nipple and said passage by the forward stroke of the valve plunger, which fits the nipple bore. This, in effect, may cause a measured discharge of liquid from the handle to the brush, inasmuch as all of the liquid contained in the plunger receiving portion 21 of the nipple is discharged therefrom upon the forward movement of the plunger.

We wish it understood that our invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the invention.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent, is:

1. A dispensing container of the class described including a nipple having a discharge passage therethrough, a sleeve rotatably attached to the inner end of the nipple and held thereby against relative axial movements, a barrel attached to the sleeve in opposition to said nipple, valve means including a stem portion threaded in said sleeve and a plunger at the forward end of the stem mounted for non-rotative movements in said nipple and reciprocally movable in its bore when the sleeve is turned relative to the nipple, said valve having a stem passage in communication at its rear end with the interior of the barrel and open at its forward end to said nipple passage when the plunger has been retracted a predetermined extent, said plunger operating during a forward stroke thereof to force liquid from said passage.

2. In a dispensing container of the class described, a nipple having a bore therethrough with its outlet end portion reduced from its inner end portion, a sleeve rotatably attached to the inner end of said nipple and held thereby against relative axial movements, a barrel attached to the sleeve in opposition to said nipple, valve means including a stem portion threaded in said sleeve, said stem portion fitting the large portion of the nipple bore and having a reduced forward end portion fitting the reduced portion of the bore, said stem portion also having an interior passage open at its rear end to the sleeve and barrel and having its forward end opening laterally of said reduced stem portion and closed by the wall of the reduced portion of said nipple bore when the valve is in one position of its movement, said valve being longitudinally movable relative to the nipple by a relative turning of the sleeve to uncover the forward end of said passage to the large portion of said bore and open communication between the barrel and the outlet end portion of the bore to permit discharge of the barrel contents from the nipple.

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