Oct. 22, 1946. C. A. NOTMAN 2,409,952

FOUNTAIN BRUSH

Filed Dec. 17, 1942

Fig. 1

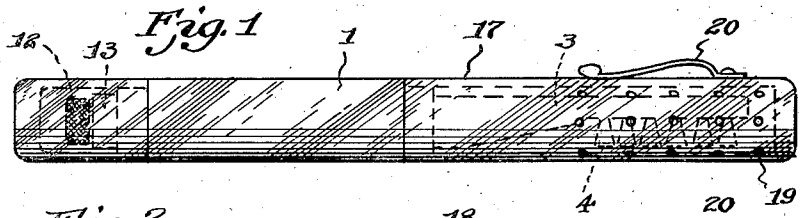
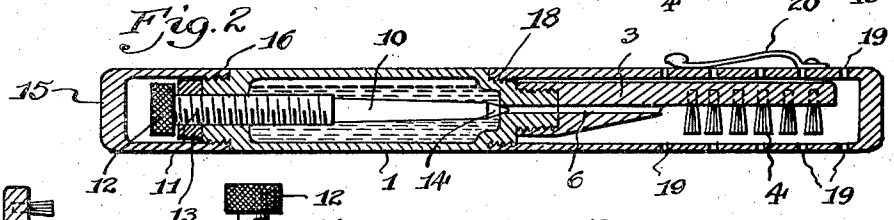


Fig. 2



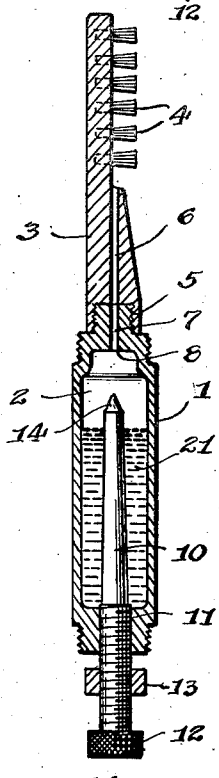


Fig. 3

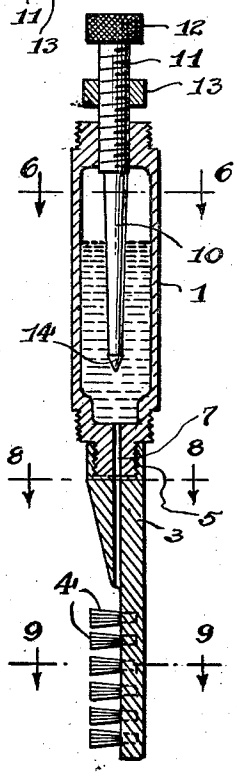


Fig. 4

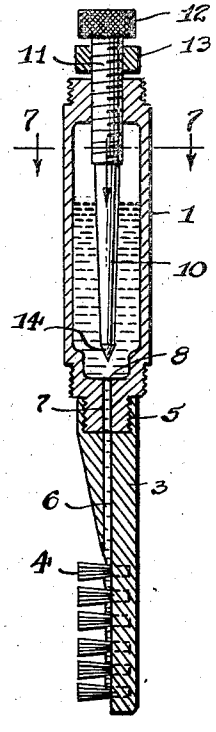


Fig. 5

Fig. 6

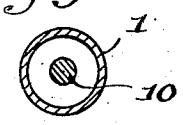


Fig. 7

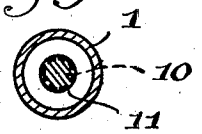


Fig. 8

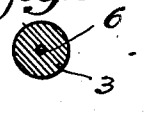


Fig. 9



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Patented Oct. 22, 1946 2,409,952

UNITED STATES PATENT OFFICE

2,409,952

FOUNTAIN BRUSH

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Application December 17, 1942, Serial No. 469,314

2 Claims. (Cl. 15—138)

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This invention relates to a device for carrying a supply of substance from which small portions may, from time to time, be separated from the supply for use as desired. The invention is particularly adaptable to what may be termed a fountain brush such, for example, as a tooth brush.

At the present time it is of paramount importance to prevent mouth diseases, particularly among those in the armed forces, and while the present invention is a personal or portable brush admirably adapted for the armed forces, the use of the device may be general among the civilian population. The general object of the invention is to provide an article such as a tooth brush which may be carried by an individual and which contains its own supply of a substance, such as an antiseptic, and which is arranged so that small portions of the supply can be used from time to time as desired.

It is the aim of the invention to provide a simple yet effective arrangement for holding the desired substance, and from which small portions may be ejected, without involving numerous parts or precision parts or other mechanism liable to get out of order. The arrangement is provided principally for handling a liquid substance. This liquid need not necessarily have the flowing characteristics of water but it should be substantially fluid so that the same will readily flow under the action of gravity. Some of the substance is segregated from the supply and ejected from the reservoir therefor, by the displacement principle, and this, as will be seen as the following description progresses, is accomplished by an exceedingly simple but novel arrangement which may embody but a single movable element.

A tooth brush is selected for the purpose of illustrating the invention and in the drawing:

Figure 1 is a side elevational view of a tooth brush constructed in accordance with the invention.

Figure 2 is a cross-sectional view therethrough.

Figure 3 is a cross-sectional view of the brush with the end closure pieces or caps removed and illustrating the first step preparatory to the removal from the reservoir of a portion of the substance therein.

Figure 4 is a view similar to Fig. 3 showing the brush in reversed position.

Figure 5 is a view similar to Fig. 4 showing the action of displacing a portion of the substance from the reservoir.

Figure 6 is a cross-sectional view taken on line

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6—6 of Fig. 4 illustrating the reservoir and the plunger.

Figure 7 is a cross-sectional view taken on line 7—7 of Fig. 5.

Figure 8 is a cross-sectional view taken on line 8—8 of Fig. 4 illustrating the outlet passage.

Figure 9 is a cross-sectional view taken on line 9—9 of Fig. 4 showing the brush head.

The brush comprises a body or handle portion 1 which is hollow so as to provide therein a reservoir 2. A brush head 3 having suitable bristles 4 is preferably detachably connected to the handle as by means of screw-thread connection 5 so that the brush head may be replaced from time to time. The brush head has a small passageway 6 in its stem portion and when connected to the handle this passageway aligns with a passageway 7 in the handle leading from the reservoir. The inner end of the passageway 7 may be shaped to provide a valve seat 8.

It will be noted that the outlet passageways 6 and 7, or at least one of them, is quite small in cross-sectional area and indeed this may be what is termed a capillary tube, in that the liquid in the reservoir will not gravitate through the small opening due to the friction or resistance to the flow of the liquid therethrough.

A valve plunger 10 passes into the reservoir through the end thereof opposite the valve seat, and this valve plunger may be screw-threaded in the end of the handle as shown at 11. The valve plunger may have an enlarged knurled or roughened head 12 by which it may be turned, and a lock nut 13 may be mounted upon its screw-threads. The end of the valve plunger is suitably constructed to engage the seat 8 and close the passage 7. To this end it may be tapered so as to provide a tapered valve member 14. The member 10 has been termed a valve plunger because this element has at least two functions, namely that of a plunger or displacement means and a closure valve.

Suitable caps or closures may be provided for detachable connection to the handle so as to cover the enlarged head 12 of the valve plunger and to cover the brush. One such closure piece is illustrated at 14 which may be screw-threaded or otherwise attached to the handle at 16. The particular attachment shown comprises screw-threads. Another closure piece 17 is detachably connected to the brush handle by suitable means such as screw-threads 18 so as to cover the brush. The closure piece or cap 18 may have suitable ventilating openings 19 therein so that the brush may dry when not in use and the device may be

equipped with a clip 20 so that it may be conveniently carried in a pocket.

This structure may be made of any suitable material and except for the clip and the brush bristles the entire structure may be made from a plastic material of which there are a number available. Some of the plastic parts may be transparent or translucent and particularly may the handle or reservoir portion be thus provided so that that supply of substance therein is visible.

The liquid substance in the reservoir, which is shown at 21, may be used as a supplemental antiseptic in the brushing of the teeth. In other words, if an antiseptic is employed, the teeth may be cleaned by a paste or powder applied to the brush and a small amount of antiseptic used in a supplementary fashion. The substance in the reservoir may alone be used in the cleaning and brushing of the teeth. This may be left somewhat to the desires of the particular users. The substance in the reservoir may, on the other hand, have cleansing properties for the cleansing of the teeth or it may combine cleansing properties with antiseptic properties.

The manner of use, other than the actual brushing of the teeth, is illustrated in the drawing. In Fig. 2 the plunger is positioned so that its tapered valve portion 14 is screwed home against the seat 8 thus sealing the reservoir. The lock nut 13 may be tightened against the end of the reservoir handle so as to tighten the thread engagement at 11 to thus seal the reservoir at this point. In this condition, with the caps applied the device may be carried with facility. In order to obtain a supply of the substance for use, the brush is positioned with the brush head uppermost as shown in Fig. 3 so that the liquid substance gravitates away from the passage 7. The plunger is now turned so that its valve portion 14 backs off the seat so that the passages 6 and 7 are now open to the atmosphere. The operator continues to turn the plunger so that it is retracted a distance from the valve seat and it will be observed that this enlarges the capacity of the reservoir. This is because some of the body of the valve plunger is moved from within the reservoir to outside of the reservoir. During this period air passes into the reservoir through the aligned passages 6 and 7.

The brush is now positioned so that the brush head extends downwardly as shown in Fig. 4 and the liquid gravitates to the lower portion of the reservoir which is now at the outlet end. The small passages 6 and/or 7, however, are such that the liquid does not flow out through the same. The plunger is now turned on its screw-threads to advance it into the reservoir. This ensmalls the reservoir and tends to create a pressure therein greater than atmospheric. As a result a certain amount of the substance is forced out through the passages 6 and 7 into the brush bristles. This is shown in Fig. 5. This forcing of the substance out through the outlet passages continues until the valve portion 14 again comes to rest upon the valve seat 8.

The substance is accordingly actually ejected by a pressure action by the simple expedient of creating a gaseous pressure within the reservoir which exceeds that of atmospheric. The outlet end of the passage 6 may be suitably positioned to discharge the substance into or on the brush bristles as desired. In actually using the device in this manner it need not be positioned vertically as shown in Figs. 3 and 4. It is sufficient that the angle be such as to cause the liquid substance to gravitate so as to provide an air chamber in the end of the reservoir adjacent the outlet during the time the plunger is being retracted and to provide an air chamber at the opposite end of the reservoir during the time the plunger is being advanced into the reservoir.

Thus a single movable element, in association with a rigid reservoir capable of retaining its geometric shape, provides for a positive ejection of substance from the reservoir and also serves the purpose of a sealing valve. The extent to which the plunger is retracted for the admission of air into the reservoir may depend upon the desires of the particular individual, although the device may be provided with a means for limiting the extent of retraction or for indicating the average or proper extent of retraction. The reservoir may be refilled by removing the plunger entirely and introducing a new supply through the opening.

I claim:

1. A fountain brush for liquid substance comprising, a brush head, a hollow handle therefor constituting a reservoir, an elongated capillary passageway leading from one end of the reservoir to a point adjacent the brush head, a displacement member mounted in the wall at the opposite end of the reservoir for movement lengthwise in the wall so that it may be advanced into and retracted from the reservoir to ensmall and enlarge the reservoir respectively, the end of the displacement member having a valve formation thereon for seating and closing the reservoir end of the passageway, whereby upon retraction of the displacement member, the passageway is opened and the reservoir is enlarged so that atmospheric air enters the same through the passageway, the brush adapted to be positioned so that the substance gravitates to the end of the reservoir having the passageway, the capillary passageway offering such restriction that the liquid substance will not normally flow therethrough, whereby upon advancement of the displacement member into the reservoir, some of the substance is ejected through the passageway by the pressure caused by the ensmalling of the reservoir.

2. A fountain brush for readily flowable liquid substance comprising, a brush head, a hollow handle therefor constituting a reservoir, said handle being rigid for retaining a fixed geometric shape, a single opening in the reservoir comprising a passage leading from the reservoir to a point adjacent the brush head, said passage being elongated and of capillary characteristics so that it offers such resistance that the liquid substance will not normally flow therethrough, a displacement plunger in substantial alignment with the passage and threaded in a wall of the handle, said displacement plunger having a valve formation adapted to seat and close the passageway, the displacement plunger adapted to be retracted from the reservoir to open the passageway and enlarge the reservoir capacity whereby air enters the reservoir, the displacement plunger being adapted to be advanced into the reservoir thereby to ensmall its capacity, so that, when the brush is positioned with the passage below the level of the substance in the reservoir, some of the substance is ejected out of the reservoir through the passage.

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