

Jan. 9, 1934.

E. J. McWHIRTER

1,942,931

TOOTHBRUSH

Filed Nov. 5, 1932

FIG. 1

FIG. 2

FIG. 3

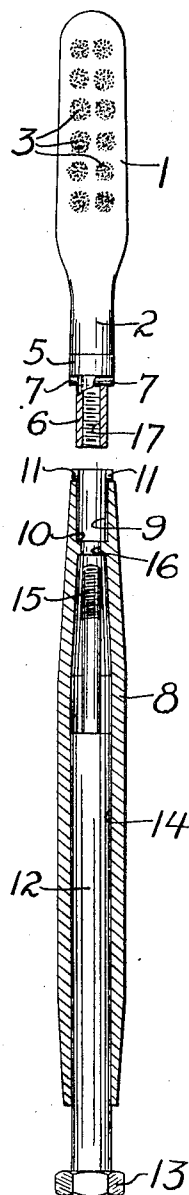
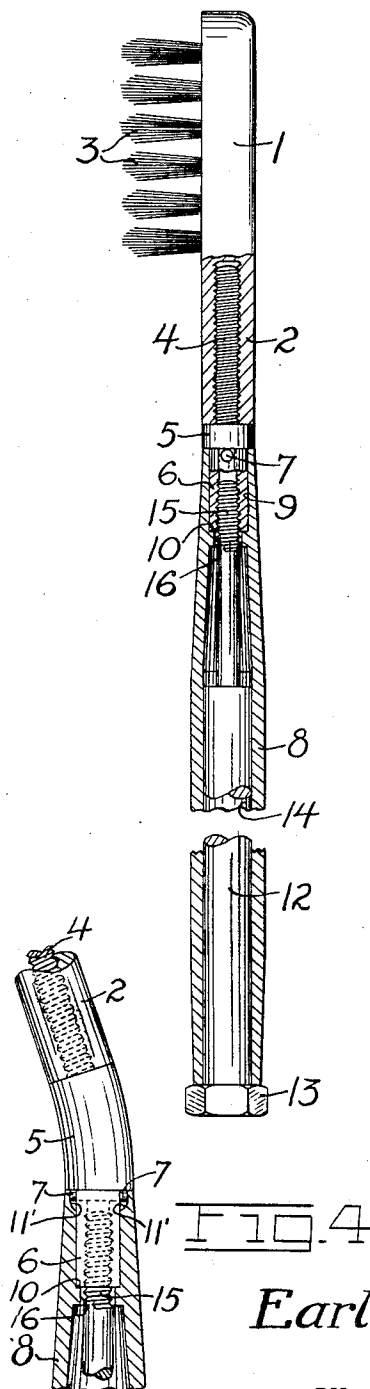
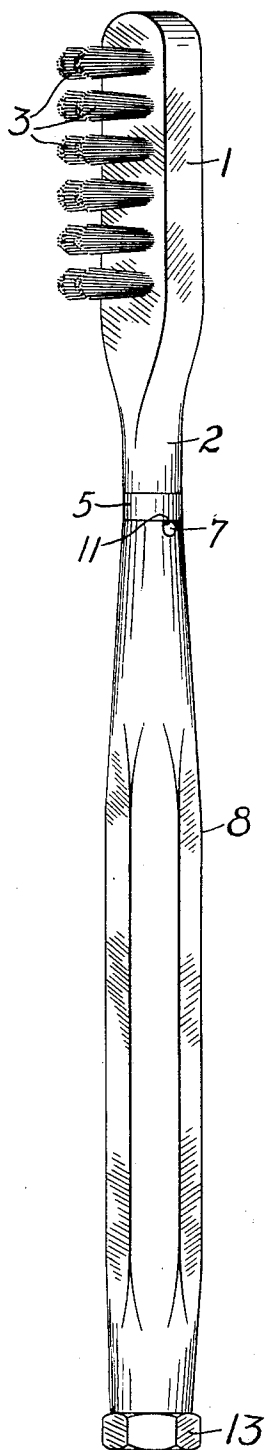


FIG. 4

Earl J. McWhirter
INVENTOR

BY
Charles L. Reynolds
ATTORNEY

UNITED STATES PATENT OFFICE

1,942,931

TOOTHBRUSH

Earl J. McWhirter, Seattle, Wash.

Application November 5, 1932. Serial No. 641,329

3 Claims. (Cl. 15-176)

My invention relates to an improvement in toothbrushes of the type having a separable head, whereby the head, when worn or when it becomes insanitary from use over a period of time, may
5 be removed and replaced by a fresh head.

Separable heads have been proposed heretofore, but the manner of connecting the head to the handle, in such instances as those of which I am aware, has been such as to be open to objection on one or more of the following grounds:
10 (a) that it increases the thickness of the solid part of the head, and hence produces undesirable crowding against the cheek and possible injury to the teeth, gums, or flesh when the brush is used within the mouth, (b) it interferes with
15 or weakens the anchorage of the bristles within the head, (c) it weakens the brush, particularly the neck, at this important point, or (d) it produces a considerable break in the surface, particularly in that portion which enters the mouth
20 which affords a lodging place for the collection of a residue of dentifrice and for dirt and germs, and affords the means to possibly injure the mouth or gums. Some such brushes are subject to one
25 or to several of these objections, and it is an object of this invention to devise a brush which shall be free of each and all such objections.

Associated with the objects above, it is my object to produce a brush having a separable and
30 renewable head, which shall have a smooth, uninterrupted surface and contour, particularly at the head and neck, those portions which enter the mouth, or which are engaged by the ends of the fingers as they guide and hold the brush in
35 use.

It is a further object to devise a brush of this general character in which the head and neck portions, that is to say, all the parts that enter the mouth, shall be of pyroxylin, bone, or like
40 substances, as now commonly used in toothbrushes, yet in which the neck supporting the brush head shall be suitably reinforced for stiffness and for strength, and to prevent danger of chipping or breakage if the brush is accidentally
45 dropped.

It is a further object to devise such a brush which shall be quickly and easily taken apart, which shall be neat in appearance, and which shall be of inexpensive construction.

50 It is a further object to devise such a brush having a separable head and a hollow handle, and having means whereby the head may be so clamped to the handle that entrance of water or like matter within the hollow handle is substantially prevented.
55

With these and other objects in view, my invention comprises the novel parts, and the novel combination and arrangement thereof, as shown in the accompanying drawing, described in this specification, and as will be more particularly
60 defined by the claims which terminate the same.

In the accompanying drawing I have shown my invention in an illustrative form, as at present preferred by me.

Figure 1 is a perspective view of the brush assembled.
65

Figure 2 is an axial section through the brush, showing the parts assembled, and Figure 3 is an axial section, taken at right angles to Figure 2, showing the parts in process of disassembly.
70

Figure 4 is a detail sectional view of a modified form of construction.

The brush head 1 may be formed of any suitable material, such as is now employed in the manufacture of toothbrushes, for instance, pyroxylin or bone, and the bristles 3 are suitably embedded or anchored within this head. This usually necessitates that the bristles extend through or almost through the head, or that the head be made thicker than is comfortable or desirable,
75 hence anything which extends into this portion of the head will impede or weaken the anchorage of the bristles. For these and other reasons I so construct the brush as to avoid any metallic connection within this portion of the head. However, the head is preferably formed with an integral neck 2 extending from the head 1, and this neck is preferably of a length which will extend outside the mouth in all positions of use of the brush. Accordingly, no metallic portion
80 whatever is exposed within the mouth, and the brush head and neck that enters the mouth is smooth and thin and comfortable, as in the ordinary toothbrush.

To accomplish these ends it is necessary that
85 the neck be of some considerable length, and in order to reinforce it, to prevent breakage of the head or neck and chipping of the end of the neck, should the brush be accidentally dropped, and in order to provide a secure means of attaching the head to the handle 8, I secure inside the neck 2 a stem 4. Preferably this is threaded within the end of the neck, but is not intended that it should be removed, and the threads are made sufficiently tight to prevent its
90 accidental removal. The stem, at the lower end of the neck, is provided with an integral collar 5, the surface of which extends as a flush continuation of the contour of the neck, so that there is no break in this surface, yet the end of the neck
95
100
105
110

is suitably protected. This collar, while it is, as shown in Figures 1 to 3, comparatively short and straight, may be of any length desired, and might be curved if it be desired to present the head at an angle to the handle, as seen in Figure 4. Since the collar is an integral part of the stem 4, this will not weaken the head in any way, nor the brush as a whole. Likewise formed as an integral part of the stem I provide an extension 6 beyond the collar 5. Preferably this is cylindrical, since this form of construction enables the entire stem to be made inexpensively on an automatic screw machine.

The handle 8 is preferably made of metal, and is hollow; that is to say, it has an axial bore 14, and at one end it is formed with an axial socket 9 of a size exactly to receive the stem extension 6, and preferably of identically the length of the extension, so that the end of the extension 6 seats upon the shoulder 10 at the bottom of the socket 9 at the same time that the end of the collar 5 seats upon the end of the handle 8. As means are provided, to be described hereafter, for drawing the head tightly down upon the end of the handle, this insures a triple seal against the entrance of water and the like into the interior of the handle—at the junction of the handle and collar 5, at the shoulder 10, and throughout the length of the stem extension 6.

As a means for effecting this clamping of the head to the handle I may provide a clamping bolt 12 having a head 13 at one end, and threaded at the opposite end, as indicated at 15 (this end being preferably reduced in cross section), and this threaded end of the bolt passes through an aperture 16 in the interior of the handle, which gives access to the socket 9. The stem extension 6 is provided with an axial bore 17 which is internally threaded to receive the threaded end 15 of the clamping bolt. Thus, as the bolt head 13 seats at one end of the handle 8, the threaded end 15 of the bolt draws the stem extension and the connected head down upon the opposite end of the handle, thus to secure the head firmly to the handle.

In order to prevent rotation of the head relative to the handle, any suitable means may be provided. As a cheap and convenient means I provide a cross pin 7 extending through the stem extension 6, just beneath the collar 5, and in the corresponding end of the handle I provide end-facing notches 11, as seen in Figures 1, 2 and 3, or grooves 11', as seen in Figure 4, to receive the projecting end of this cross pin. The cross pin preferably does not extend beyond the circumference of the collar 5, and the surface of the end of the handle merges into the contour of the collar 5 and the stem 2, hence there is no break in this surface, nothing for the fingers to engage, and the brush is neat and fits the hand comfortably. The remainder of the surface of the handle may be formed in any manner desired, being, as shown, hexagonal, so that it may be grasped and will not turn in the hand.

The brush thus comprises but four principal parts—the head 1 with its neck, the stem 4 which is in effect a part of the head and neck, the handle 8, and the clamping bolt 12. All these parts, except the head itself, may be made by automatic screw machinery, and the head may be constructed by the same type of apparatus now used to manufacture the ordinary brush. Thus the construction lends itself readily and cheaply to quantity manufacture. Its contour is unbroken, all that portion which enters the mouth

is made of pyroxylin, bone, or the like, and is no thicker than the ordinary toothbrush, and moreover, has no projecting parts. The entire device is inexpensive, and can be quickly disassembled, and a new head put in the place of a used head. Because when the device is disassembled there are but three parts—the handle, the clamping bolt, and the head with its permanently secured neck, which latter is to be thrown away after a period of use—there is small likelihood of losing any part, and because the fingers grasping the brush in use do not come in contact with the head of the bolt, there is no possibility of parts coming loose while in use. Because the handle is hollow it may readily be cleaned by running water through it, and the handle and clamping bolt can be sterilized as frequently as may be desired, for instance, each time a new head is put in place.

What I claim as my invention is:

1. A toothbrush comprising a head with bristles projecting therefrom, and formed of one piece of material, whereby there is no break or joint in the part which enters the mouth, a separable handle socketed at its head end, a stem projecting from the head and received within the handle socket, a clamping bolt extending through the handle and threadedly engaged with said stem, and means interengageable between the head and handle to prevent relative rotation when the parts are assembled.

2. A toothbrush comprising a one-piece brush head, a separable hollow handle socketed at its head end, a stem secured within and projecting from the head and received within such socket, and a clamping bolt extending completely through the handle and having a head at one end engageable with the handle end, and threadedly engaging the stem at its other end, whereby the brush head may be drawn down upon the end of the handle.

3. A toothbrush comprising a one-piece brush head including an integral neck, a stem threaded within and reinforcing the neck, and projecting therefrom, a separable handle socketed at one end to receive the projecting stem end, and means associated with the handle to removably secure said stem end within the socket of the handle.

4. A toothbrush comprising a one-piece brush head including an integral neck, a stem received within and reinforcing the neck, and projecting therefrom, a separable hollow handle socketed at one end to receive the projecting stem end, and a headed clamping bolt extending through the handle and threaded at its end opposite the bolt head, the end of the stem having a threaded aperture to receive the bolt end, whereby the brush head may be drawn down upon the corresponding end of the handle.

5. A toothbrush comprising a brush head including an integral neck, a stem received within and reinforcing the neck, and projecting therefrom, a separable hollow handle socketed at one end to receive the projecting stem end, a headed clamping bolt extending through the handle and threaded at its end opposite the bolt head, the end of the stem and the bolt end having threaded engagement, whereby the brush head may be drawn down upon the corresponding end of the handle, and a cross pin secured in the stem, the corresponding end of the handle having end-facing recesses to receive said cross pin, whereby to prevent rotation of the head relative to the handle.

6. A toothbrush comprising a brush head hav-

ing bristles embedded therein, and an integral neck, a metallic stem threadedly secured in the end of the neck and extending substantially to the first bristles, a collar formed on said head
5 and forming substantially a flush continuation of the surface of the neck, the stem having a cylindrical extension therebeyond, an axially apertured handle having a cylindrical socket at one end to receive said stem extension, and of a
10 depth somewhat in excess of the length of such extension, the contour of the handle at this end merging into the contour of the collar and neck, a headed clamping bolt extending through the axial aperture of the handle, and threaded at
15 the end opposite the bolt head, the stem extension having an internally threaded axial bore to receive the bolt end, and the bolt being of such length as to draw the collar to a tight seat
20 engages the opposite end thereof, and means interengageable between the stem and handle to

prevent their relative rotation when thus assembled.

7. A toothbrush comprising a handle, a head, bristles anchored in such head, means to releasably secure the head to the handle, the head-engaging end of the handle having a groove open
80 only in the end and towards the head, and the head having a pin projecting laterally and engageable with the groove to prevent rotation of the head relative to the handle. 85

8. A toothbrush comprising a handle, a head, bristles anchored in such head, means operable from the remote end of the handle to releasably secure the head to the handle, the head-engaging end of the handle having a groove open only
90 in the end and towards the head, and the head having a pin projecting laterally and engageable with the groove to prevent rotation of the head relative to the handle. 95

EARL J. McWHIRTER.

25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150