

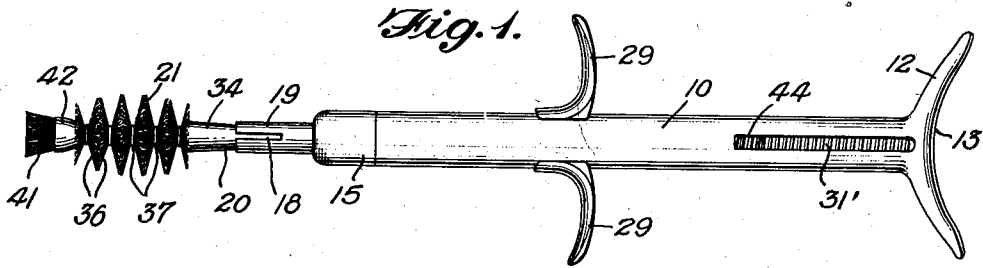
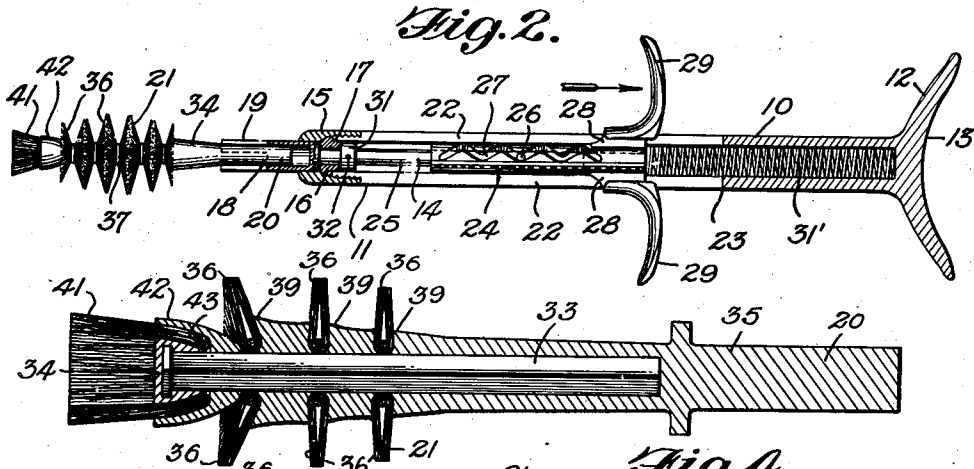
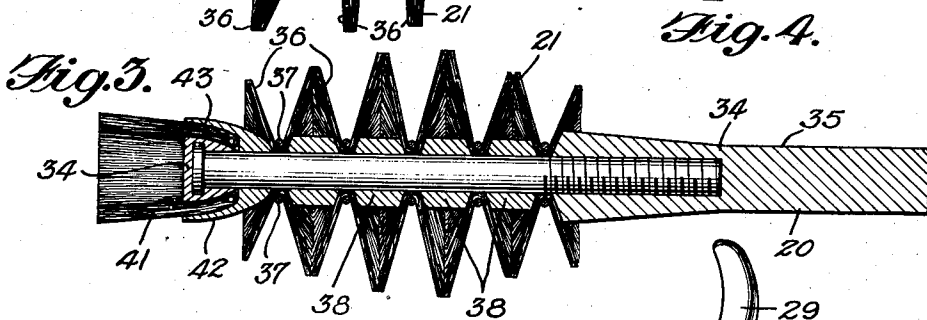
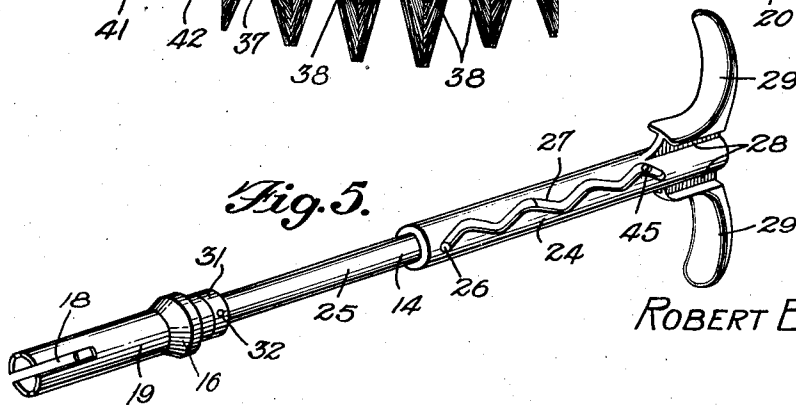
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R. B. DAVIDS

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COMBINED TOOTH BRUSH AND MASSEUR

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Inventor
ROBERT B. DAVIDS,

By *Henry Love Clark*
Attorney

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COMBINED TOOTH BRUSH AND MASSEUR

Robert B. Davids, Baltimore, Md.

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2 Claims. (Cl. 15-26)

This invention relates in general to improvements in a combined tooth brush and gum masseur and more particularly to improvements in mechanical tooth brushes of the type involving manually operable reciprocal mechanism for imparting an oscillatory movement to cause the bristles of the tooth brush to strike the teeth vertically in an up and down movement by the oscillation of the brush.

Objects of the invention are the provision of a brush of the character set forth which is readily and easily manipulated to reach both the inner and outer surfaces of the teeth and also the crevices between the same in both the front and back of the mouth; the provision in such a brush of features whereby the up and down movement of the bristles firmly but gently applies the ends of the bristles to the surface of the teeth in such manner that injury to the teeth or gums or flesh on the inside of the mouth is avoided; the provision of a novel mechanism for effecting the oscillatory movement of the bristles of the brush in a manner providing in a simple way many oscillations of the bristles upon each reciprocation of the driving mechanism for the bristles; the provision of mechanism of such character that is simple in construction and operation and capable of easy manufacture at relatively small cost; the provision of a crutch-shaped handle and finger trigger construction whereby the position or location of the brush may be readily shifted in the mouth during cleaning of the teeth or massaging of the gums without changing the grip on the handle by the person using the brush and yet capable of permitting the user to readily shift the grip from either hand to the other at will; the provision of a construction permitting ease and facility in dismantling and re-assembly of the brush in cleaning and sterilizing the same; the provision of a bristle construction embodying spaced transverse disks of bristles and a longitudinally extending cup of bristles at one end of the transverse disks in a manner involving a simple manufacturing process, whereby the cleaning and massaging action is essentially a scrubbing action rather than a sweeping or wiping action on the teeth and gums; and the invention has for further objects such other improvements or advantages in construction and operation as may be found to obtain in the structures and devices hereinafter described or claimed.

In the accompanying drawing, forming a part of this specification and showing, for purposes of exemplification, a preferred form and manner in which the invention may be embodied and prac-

ticed, but without limiting the claimed invention specifically to such illustrative instance or instances:

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

Fig. 2 is a similar view partly in vertical cross-section;

Fig. 3 is a detailed longitudinal sectional view taken through the bristles of Fig. 2, illustrating the construction of the bristle portion of the brush;

Fig. 4 is a detailed view similar to Fig. 3 but of an alternative form of brush bristle construction; and

Fig. 5 is a detailed perspective view of the oscillation mechanism shown in Fig. 2.

Referring to the drawing, there is shown a tubular casing 10 open at its forward end 11 and provided at its rear opposite end with a crutch-shaped butt 12 as a handle. The crutch-shaped handle 12 is curved as shown so as to fit easily within the inside shank of the thumb with the major portion of the surface 13 against the palm of the hand. A shaft 14 is rotatably secured in the casing 10 at its forward end by a screw-threaded cap 15 threaded on external threads at the extreme forward end of the casing 10. The shaft 14 is supported for free rotation within the casing 10 by a rotatable bearing 16 disposed around a reduced portion of, and freely encircling the shaft 14 and bearing against the end edge 17 of the casing 10 and a beveled surface on the inside of the cap 15. The forward end of the shaft 14 is reamed to provide a socket 18 and the wall of the socket is slit at several points to provide a spring clutch 19 for removably holding a stem 20 carrying the bristles 21 of the brush. A rear portion of the shaft 14 extends partway inside the casing as shown at 25 and is provided with a cam pin 26 just short of the rear end of the portion 25. The casing is provided with two oppositely disposed slots 22 extending from a point 23 beyond the handle 12 to the forward end of the casing. A sleeve 24 is surmounted in encircling relation on the shaft portion 25 so as to be freely reciprocated inside the casing 10 on the cam-follower pin 26 of the shaft 14. The sleeve 24 is provided with a serpentine slot 27 for co-operation with the pin 26, there being eight cam surfaces provided within the serpentine. The sleeve 24 is also provided at its rear end with two oppositely disposed connecting guides 28 extending through the slots 22 and each terminating in a trigger 29 wide

enough to extend beyond the side edges of the slots 22 to protect the fingers of the operator so that when the trigger is retracted toward the crutch-shaped handle 12, the serpentine slot causes the pin 26 and shaft 14 to oscillate eight times, four in one direction and four in the opposite direction. Within the casing 10 between the rear end thereof and the rear end of the sleeve 24 a spring 31' is interposed to normally propel the sleeve 24 away from the crutch-shaped handle 12 towards the forward end of the casing 10, causing a like oscillation eight times.

In operation, the person using the brush grasps the crutch-shaped handle 12 with the shank of the thumb against the surface 13, and with the index and next finger extended alongside of the casing 10 and the thumb on the opposite side of the casing so that the surface 13 is freely resting on the palm of the hand. The bristle portion is then placed inside the mouth alongside the teeth or gums with the row of bristles transversely to the teeth. Upon retraction of the ends of the index and next finger on the triggers 29, the sleeve 24 is drawn toward the crutch-shaped handle and then the pressure of the fingers released, causing the sleeve 24 to be retracted against the spring 31' and then propelled forwardly by the latter. The forward movement of the sleeve 24 is limited by a bushing 31 fixed by pin 32 to the shaft 14. At each movement in each direction the bristles 21 partake of eight oscillations. Consequently upon each retraction of the finger tips and release of the pressure thereof on the trigger finger pieces 29 the bristles 21 partake of sixteen oscillations causing sixteen up and down scrubbing contacts of the ends of the bristles with the teeth or gums. The action is as rapid as the user manipulates the triggers but the pressure on the teeth or gums is only that of the bristles. Normally bristles 21 tend to bend so that with rapid oscillation only the sides of the bristles would make contact with the teeth or gums according only a sweeping or wiping action rather than a scrubbing action. To this end, to retain the advantages of the oscillatory action, it is essential that the bristles 21 be mounted so as always to present the ends rather than the sides of the bristles to the teeth or gums. Advantageously the stem 20 is therefore built up of a metallic pin core 33 surrounded or encased by plastic material 34, like "Pyralin", Celluloid or the like, at its opposite ends. The rear end is tapered to provide a head 35 for removable insertion in the spring chuck 19. Between the forward and rear ends of plastic material 34 a series of rings or disks 36 of bristles are mounted encompassing the pin 33, each ring or disk of bristles being held together by linen thread or fine wire 37. The bristles of each disk are made to flare towards those of a next adjacent disk until their ends meet, as shown in Fig. 3, by pressing plastic collars 38 between the disks until the material of the collars 38 spread laterally a sufficient amount against the portions of the bristles adjacent the wire or thread 37 as to cause the ends of adjacent bristles to meet. The disks are preferably of widest diameter at the center of the series than those toward the two opposite ends so as to provide bristles tapering down in both directions from the center of the series. In the alternative form illustrated in Fig. 4 the pin 33 is a square shaft to avoid turning of the plastic material and disks. The collars are made concave as illustrated at 39 to prevent flaring as in the embodiment illustrated in Fig. 3. The end

transverse disk is slightly curved forwardly by its collar 38. From three to five disks are sufficient for most purposes. In order to provide bristles capable of reaching regions and crevices not accessible to the row of transverse disks of bristles, a cup of bristles 41 is provided on the end of the stem. As will be seen from Figs. 3 and 4, the same sort of disk is similarly sleeved on the pin 33 at the end thereof but the collar 42 between the same and the next disk is channeled as at 43 so as to hold the disk of bristles down in a direction longitudinally of the pin instead of transversely. An inner head of plastic material 34 is then pressed on the end of the pin by pressure, or pressure with the aid of heat, so as to hold the bristles of the end disk tightly against the channeled collar 42 in the form of a longitudinally extending cup of bristles. To prevent the plastic material from slipping relative to the metal pin 33 the latter is knurled or roughened or made square, all in the manner indicated in Figs. 3 and 4. The channel 43 and the head 34 are preferably tapered as shown. At the rear of the casing 10 slots 44 are also provided in the region of the spring 31' to facilitate sterilization.

With the brush bristle elements described, trigger fingers 29 and crutch-shaped handle 12, the user may readily alter the position and location of the bristles in the mouth, while oscillating the bristles, merely by allowing the crutch-shaped handle to slide over the palm of the hand at will while still retaining a firm hold on the casing 10 and without removing the bristles from the mouth.

The brush is readily and easily dismantled and reassembled by the user in sterilizing and cleaning the same. The cap 15 is unscrewed from the casing 10 and the shaft 14 withdrawn. In so doing the bearing 16, bushing 32 and sleeve 24 are removed from the casing 10 by the mere removal of the shaft 14. The spring 31' is then removed by tipping the casing 10. The casing is easily reached for cleaning through the slots 22 and 24 and open end. The sleeve 24 is readily displaceable over the pin 26 on the shaft 14 so that all parts thereof are accessible. When the bristles 21 are worn, the stem 20 is removable from the spring clutch 19 for renewal of new bristle inserts. The parts are all of such construction and operation that they involve but inexpensive, simple and elementary manufacturing operations. Due to the feature of effecting the oscillations by a serpentine slotted sleeve co-operating with a pin on the shaft, the effort to operate the brush is practically nil since the movement and energy required at any point in the stroke of the sleeve 24 is that required to move the pin 26 and shaft 14 the length of only one of the inclined slots of the serpentine. Consequently a spring 31' of very little tension is required which greatly aids the ease of operation by the user.

The pitch of the slots constituting the serpentine should be approximately 45°. The arc of the oscillations should not be less than 60° or more than 90°. With less than 60° no substantial scrubbing effect is obtained. With more than 90° there may be an undesirable jumping effect of the bristles 21.

The sleeve 24 is provided with an aperture indicated at 45 for insertion and removal of the pin 26 from the shaft 14.

Those features of the invention in the brush per se exemplified in the foregoing description forms the subject-matter of my copending divi-

sional application Serial No. 267,557, filed April 13, 1939.

The invention as hereinabove set forth is embodied in a particular form of construction but may be variously embodied within the scope of the claims hereinafter made.

I claim:

1. A combined tooth brush and masseur comprising: a tubular casing open at its forward end and having a handle at its rear end, and having opposite longitudinal slots which extend from its forward end towards its handle; a rotatable shaft having a bearing engaging the casing and provided with a work implement supporting portion outside the same and an actuating portion extending part way into the casing; a sleeve reciprocally mounted on the actuating portion of the shaft within the casing and provided with a ser-

pentine slot cooperatively connected with a cam-follower means fixed on the actuating portion of the shaft, and provided at its rear end with guides extending through the longitudinal slots and respectively terminating in finger grips outside the casing retractable towards the handle; and spring means in said casing interposed between the rear end of the sleeve and the casing for retraction of the sleeve against the spring means under pressure on the grips and propulsion of the sleeve by the spring means on release of pressure on the grips.

2. Apparatus as claimed in claim 1 and in which the pitch of the cam surfaces of the serpentine slot are approximately 45° and the arc of oscillation between not less than 60° nor more than 90°.

ROBERT B. DAVIDS.