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ELECTRIC MOTOR DRIVEN TOOTHBRUSH

Filed March 11, 1940

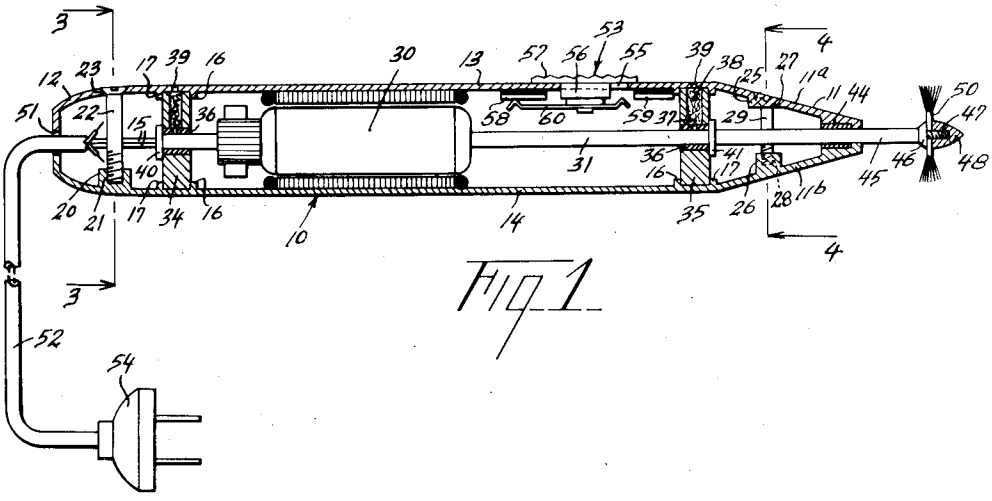
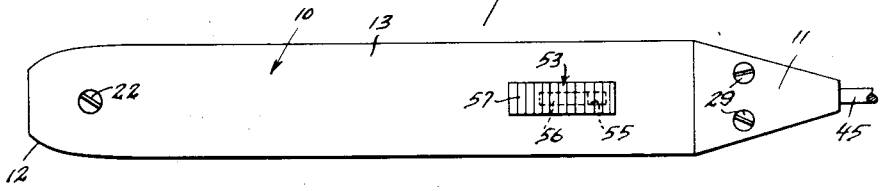


FIG. 1

FIG. 2



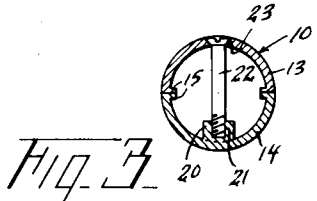


FIG. 3

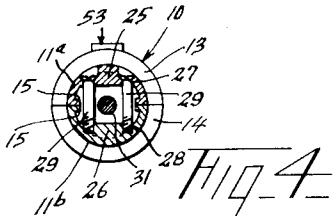


FIG. 4

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ELECTRIC MOTOR DRIVEN TOOTHBRUSH

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6 Claims. (Cl. 172—36)

This invention relates to an electric motor driven toothbrush.

The primary object of this invention is to provide a small, portable toothbrush unit designed so as to be easily and conveniently held in the hand of the user during the application of the brush to the teeth, the unit including an improved brush shaft and a motor casing construction housing an electric motor for operating a rotating toothbrush with the casing so designed as to permit ease of assembly of the parts of the operating mechanism as well as to facilitate access to such parts in the event of repair or replacement thereof, and the motor casing further including a switch device so situated thereon as to be operable by the thumb of the hand.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a longitudinal sectional view of the entire electric toothbrush unit showing details of construction of the invention.

Fig. 2 is a plan view of the electric toothbrush unit.

Fig. 3 is a transverse sectional view taken on line 3—3, Fig. 1.

Fig. 4 is a transverse sectional view taken on line 4—4, Fig. 1.

Referring to the drawing, wherein like numerals designate like parts, the invention includes a casing 10 constituting the handle of the toothbrush which is formed cylindrical in shape with the forward end or nose of the casing sharply tapered as at 11 which the rear end 12 of the casing is also tapered but preferably of a taper less than that of the nose 11. The casing 10 may be made of any suitable material such for example as any of the well known forms of plastic compositions and is formed in two identical sections 13 and 14 mating together on a diametral plane. Each section is provided along the longitudinal edges thereof with an inwardly directed reinforcing flange 15 which extends the full length of the casing section so as to provide abutting surfaces of substantial area when the sections are mated together as clearly shown in Figs. 3 and 4.

Also provided in the interior of each casing section substantially at each end of the semi-cylindrical body portion thereof is a pair of longitudinal spaced radial shoulders 16 and 17, so formed that the shoulders of one casing section will lie in the same plane in opposed relation to the respective shoulders of the other casing section, as clearly shown in Fig. 1.

The rear end of the lower casing section 14 is provided with an integral upstanding boss 20 formed with a threaded opening 21 adapted to threadedly receive a bolt or screw 22, the upper casing section being provided with a countersunk opening 23 adapted to snugly receive the head of the screw 22, the arrangement being such that said screw will lie in the vertical longitudinal axial plane of the casing, see Fig. 3. Within the nose portion 11a of the casing section 13 there is provided an integral transverse wall 25, there being provided a similar opposing wall 26 in the nose portion 11b of the casing section 14. Formed in the wall 25 are transversely spaced screw receiving openings 27 countersunk at their outer ends, the wall 26 being provided with similarly registering threaded openings 28 each to threadedly receive the end of a screw 29. It is thus apparent from the above description that the casing sections 13 and 14 are retained in assembled relation by the front screws 29 and the single rear screw 22.

Suitably fixedly mounted within one of the casing sections is an electric motor 30 having a motor shaft 31. Mounting the motor shaft 31 axially within the casing 10 are two shaft supports 34 and 35, each in the form of a circular disc and of a width such as to snugly seat between the shoulders 16 and 17 of each casing section. The shaft supports 34 and 35 are each provided with a bearing 36 having an oil groove 37 registering with an oil reservoir 38 provided in the support which reservoir in turn is to register with an oil opening 39 in the upper casing section 13. The motor shaft 31 is rotatably mounted in each of the support bearings 36, and is provided at one end with a collar 40 adapted to abut the outer face of the support 34, there being also provided a collar 41 on the shaft 31 to similarly abut the outer face of the other support 35, both collars 40 and 41 being fixed in any desired manner to the motor shaft 31 and functioning to prevent axial movement of the shaft in either direction.

The tip portion of the nose 11 is provided with

a bearing 44 rotatably supporting the end portion of the motor shaft 31 which projects outwardly of said nose for a short distance as at 45. Provided at the terminal end of the shaft 31 is a radial shoulder 46 and an axial threaded extension 47 adapted to threadedly receive a tapered blind nut 48. Between the shaft shoulder 46 and nut 48 there is adapted to be clamped a rotary toothbrush 50. It is apparent that by virtue of this construction the rotary toothbrush 50 may be readily removed and replaced by any other form and size of toothbrush or in fact by any other rotary dental device such, for example, as a polishing or massaging disc, etc.

From the above it is apparent that the electric motor including the motor shaft 31 and its supports 34 and 35 may be inserted and removed as a unit from the casing section 14. When inserted in position the supports 34 and 35 are securely held in place by the shoulders 16 and 17.

The rear end 12 of the casing 10 is provided with an opening 51 through which is inserted an electric conductor 52 suitably connected (not shown) to the electric motor terminals (not shown) and switch 53. The conductor 52 is provided at its other end with a conventional plug 54 for attachment to a conventional outlet in the manner well known.

The electric switch 53 is of the slide type and is mounted on the casing section 13 adjacent the nose portion 11*a*. Formed in the casing section 13 is a slot 55 into which is inserted for slidable longitudinal movement therein a slide 56 having a knurled or serrated head 57 of a size such as to completely cover said slot in either the "off" or "on" position of the switch. Arranged adjacent each end of the slot 55 interiorly of the casing section is a contact plate 58 and 59 suitably secured to and insulated with respect to said casing section, and fixed to the under side of said slide 56 is a contact bar 60 so positioned as to always engage the contact plate 58 and to be out of engagement with the contact plate 59 when the switch is in "off" position and to engage said contact plate 59 when the switch is moved into the "on" position. The slide 56 includes any suitable means or may be so formed as to preclude and possibility of its disassociation from the slot 55.

In the use of the device the casing 10 is held in the hand with the nose extending between the thumb and forefinger such that the switch 53 may be readily actuated by the thumb in the manner readily apparent. Repair, replacement of parts and cleaning of the mechanism may be readily effected by the single expedient of removing the screws 22 and 29 holding the casing sections together.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A motor driven rotary toothbrush comprising a divided hollow casing handle, an electric motor within said handle, a motor shaft projecting outwardly of one end of said handle, a disc arranged on each side of said casing for rotatably supporting said shaft and positioning means within said handle adapted to engage said discs whereby to retain the same in fixed relation to said handle.

2. A motor driven rotary toothbrush comprising a longitudinally divided casing defining two identical casing sections and formed to provide a tapered rear end and a tapered nose at its forward end, an electric motor having a motor shaft extending from each side thereof, a removable shaft support rotatably supporting the inner end of said shaft, a removable shaft support rotatably supporting an intermediate portion of said shaft, the outer end of said shaft extending outwardly of the nose of said casing, and means formed on the interior of each casing section arranged to engage each of said removable shaft supports whereby to lock the same in fixed relation to said casing.

3. A motor driven rotary toothbrush comprising a longitudinally divided casing defining two identical casing sections and formed to provide a tapered rear end and a tapered nose at its forward end, an electric motor having a motor shaft extending from each side thereof, a removable disc rotatably supporting the inner end of said shaft, a removable disc rotatably supporting an intermediate portion of said shaft, the outer end of said shaft extending outwardly of the nose of said casing, and means integrally formed on the interior of each casing section arranged to engage each of said discs on opposite sides thereof whereby to lock the same in fixed relation to said casing, said casing including a slide switch carried by one of the casing sections and adjacent said nose whereby to be actuated by the finger or thumb of the hand when said toothbrush is in use.

4. A motor driven rotary toothbrush comprising a longitudinally divided casing defining two identical casing sections and formed to provide a tapered rear end and a tapered nose at its forward end, an electric motor having a motor shaft extending from each side thereof, a shaft support rotatably supporting the inner end of said shaft, a shaft support rotatably supporting an intermediate portion of said shaft, the outer end of said shaft extending outwardly of the nose of said casing, and means formed on the interior of each casing section arranged to engage each of said shaft supports whereby to lock the same in fixed relation to said casing, said casing sections being provided along their opposed edge portions with reinforcing mating flanges, and removable fastening means for securing said casing sections together.

5. The motor driven rotary toothbrush as set forth in claim 2, wherein each said shaft support comprises a circular disc of substantial thickness, and said means comprising a pair of spaced radial shoulders for each shaft support formed on the interior of each casing section in opposed relation to each other, each pair of said shoulders seating therebetween an associated shaft support whereby in the assembly of said casing sections said shoulders will lock said shaft supports in said fixed relation.

6. The motor driven rotary toothbrush as set forth in claim 2, wherein each said shaft support comprises a circular disc of substantial thickness, including a shaft bearing axially positioned in each disc, a lubricant reservoir formed in each disc, and a passage through each said shaft bearing in communication with its associated reservoir; and said means comprising a pair of spaced radial shoulders for each shaft support formed on the interior of each casing section in opposed relation to each other, each pair of said shoulders seating therebetween an associated shaft support whereby in the assembly of said casing sections said shoulders will lock said shaft supports in said fixed relation.

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