

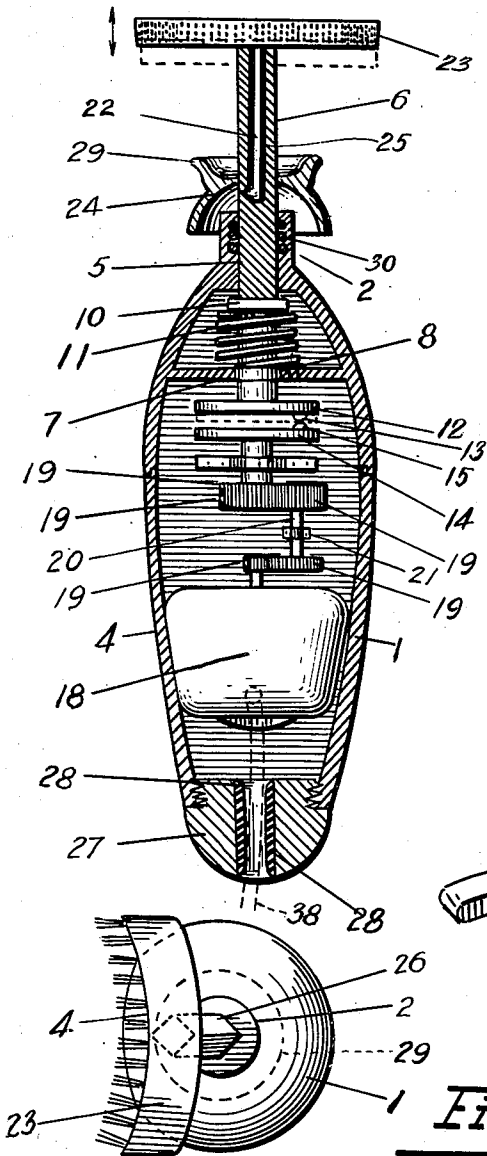
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MECHANICAL TOOTH BRUSH

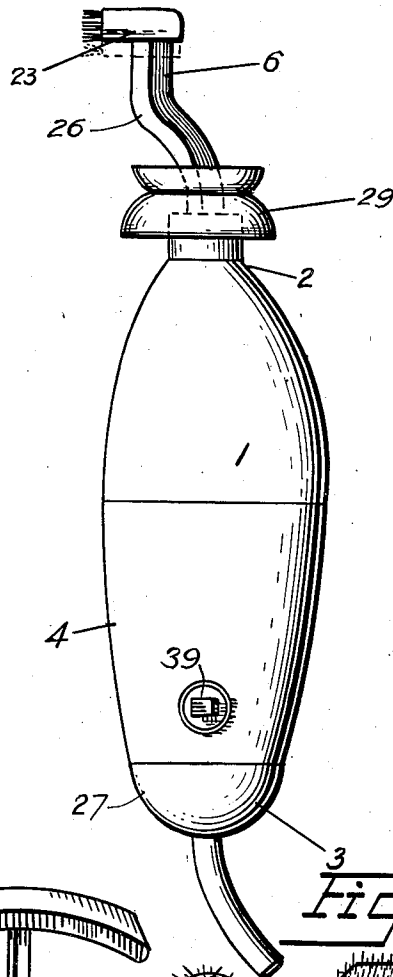
2,290,454

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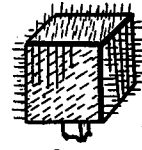
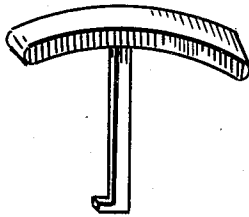
*Fig. 2.*



*Fig. 1.*



*Fig. 6.*



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*Fig. 4. Fig. 5.*

*Fig. 3.*

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# UNITED STATES PATENT OFFICE

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## MECHANICAL TOOTHBRUSH

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2 Claims. (Cl. 15-22)

The invention refers to dental equipment and more particularly to manually held motor tooth brushes. It has among its objects to provide a brush of this type which:

- (a) Operates in the most hygienic manner;
- (b) Operates in cooperation with the natural functions of the blood vessels, gums and parts of the mouth and teeth;
- (c) Has an action that will facilitate the removal of the material and substances injurious to the teeth in the most effective way;
- (d) Has convenient form and design for the hand;
- (e) Has mechanical features such that it can be used with motor equipment of every nature designed to fit within the handle or shell;
- (f) Is of as simple construction as possible;
- (g) Enables it to be brought conveniently to the mouth without excessive interference with the other portions of the facial contour;
- (h) Provides for proper alignment during operation and keeping it there definitely;
- (i) Has a form such that it may be more firmly gripped;
- (j) Provides for the use of smaller bristle than customary;
- (k) And has such other features that will add to the intrinsic value of the article, improve its operation, and render it safe and suitable for domestic purposes.

The usual type of motor brush invented has not been found sufficiently practical to warrant its manufacture, and has been limited in general to the conventional manner of brushing teeth.

The conventional method of brushing teeth is erratic as it follows directions opposing the general flow of the blood and against the grain of the teeth, gums and blood vessels, and results in injury and unsatisfactory brushing of the teeth and muscles holding them. To overcome these objections, applicant has constructed a tooth brush that is scientifically correct. It brushes the teeth in cooperation with the grain of the muscles and nerves, and the recuperative flow of the blood. It definitely cleans the particles of material from between the teeth and the encrustings that tend to accumulate. The arrangement is so natural and the operation so smooth and agreeable that the user finds the use of the brush pleasurable, instead of being the objectionable task that the usual way appears to make it. Arrangements are provided to keep the handling of the device sanitary and its parts clean. The action is made relatively slow that it may be safe

against injury to the user, and also enable the work to be more efficiently done. This is made possible by designing the brush to fit into the mouth in front of the greater surface of the teeth, and by having the movement of the bristles of the brush such that they act vertically up-and-down over the teeth and gums in cleansing same. The conventional method acts, across the teeth transversely, and does not clean out the cracks between same, while applicant's device does: The brush is arranged with an offset that keeps the handle away from the face, and the propelling rod or shank is made rectangular to keep it definitely straight and aligned.

In the drawing, which illustrates an embodiment of this invention:

Figure 1 is a side elevation of a tooth brush embodying this invention,

Figure 2 is a sectional view taken longitudinally through the tooth brush shown in Figure 1,

Figure 3 is a plan view of the tooth brush with the safety cup removed,

Figure 4 indicates another brush implement usable in place of that indicated in the above figures, and the possibility of changing same to suit the needs,

Figure 5 is a modified form of brush implement for special cleaning purposes,

Figure 6 is another modified form for cleaning in between teeth and other particular uses.

Similar reference characters refer to similar parts throughout the drawing.

In the construction indicated in the drawing, 1 represents a hollow shell of some suitable material like one of the many insulating plastics existing and available today. The shell is preferably formed as indicated, of partially circular cross-section and tapered towards the ends, 2 and 3, respectively. The front surface portion 4 is flattened for the purpose of rendering it more agreeable to the grasp of the hand; less obstructive to the contour of the chin of the face, more stable for packing or resting on a shelf, and interiorly works better for the motor base.

It is preferably made in three parts as indicated, to facilitate assembly and repairs. Its walls are relatively thin, and upper portion 2 forms the neck and is of cylindrical form exteriorly. The interior 5 of the neck is made rectangular in cross section, so as to guide a square propeller shank or shaft 6 in a non-turning definitely aligned direction. This shank or shaft extends down into the shell through a square central hole 8 in a cross-plate or partition 7, the

latter being connected with the inside surface 9 of the shell. A collar 10 is mounted rigidly on the shank or shaft above the plate 7 in contact with a coiled spring 11 adapted to keep the shank or shaft in place. This spring serves as a compression and extension spring. Its general function is primarily compression in order to bring the shank or shaft downwardly into the shell, and for this purpose, is suitably attached to the plate and the shank or shaft. Thus the spring resiliently biases shaft 6 to a central position about which it may reciprocate. An eccentric mechanism consisting of a reciprocable disc 12 is mounted on the end portion of the shank or shaft and has a cam block 13 mounted on its under surface. This cam block comes into contact with another cam block 15 on another similar but rotative disc 14, spaced away from it and attached to the shaft 16, which is journaled at 17 on the interior of the shell. This disc is operated by an electrical motor 18, preferably operable on direct or alternating current through a train of reduction gears 19 on their shafts 20 and bearings 21. The purpose of these gears is to have the speed of the brush made relatively slow. As the disc 14 revolves, its cam block 15 engages the block 13 and as the shank or shaft 6 cannot rotate, due to its square cross section and the square hole it passes through, it forces the reciprocable disc to lift up against the compression of the spring 11, and then be lowered after the blocks pass by each other. This gives the shank or shaft 6 in sequence a reciprocating movement at every revolution of the disc 14, and one that is sudden and forceful. The effect on a brush 23 is likewise, and makes its brushing very effective. The brush is preferably attached to a shank 22 which has a projecting lock element 24 that fits into a passage 25 in the upper portion of the shank or shaft 6 and locks there. It will not come out or turn without special manipulation. The shank or shaft 6, where it projects from the neck 2, is made with an offset 26 that does not interfere with its travel, but brings it to a position in front of the shell and accessible to the oral cavity of the user, without interference. The brush is formed on an arcuate contour to enable it to fit about the teeth and gum readily. The substitution of a massager or other device to replace the brush with bristles mounted on a suitable shank can be done as required or convenient. The bottom portion of the shell is provided with a screwed in cap 27, as shown, and has an insulated passage 28 therein for an electric cable 38. The cable goes to the switch 39 and thence to the motor 18. This motor is suitably mounted within the casing. A protector double cup 29 preferably of soft rubber is secured to the shank or shaft 6, and comprises a form representing two caps placed back to back in a vertical plane so as to catch brushings and keep them off the shell and the hands of the user. The neck 5 is provided with suitable gasket members 30 for keeping the shell water tight and the shaft 6 lubricated.

In Figure 4, the brush implement is made without bristles 36, provided in the original form, and is intended for dry brushing, as well as the massaging of the gums. It is made of rubber or the like and has a curved member 40 with rounded edges 41, arranged to fit in the oral cavity conveniently. In Figure 5, a ball 51 is provided, and is preferably of rubber with bristles 36 projecting therefrom as shown. The ball permits the teeth to be cleaned in special ways as

required from time to time. In Figure 6, the implement consists of a rectangular member 50, which has bristles 36 also projecting from it in every direction. This form has the advantage of being suitable for cleaning the teeth in between the cracks or edges leading to same. These forms also enable work to be done around bridge-work and other types of dental work where the usual form of tooth brush would be undesirable.

While but one form of the invention is shown in the drawing, it is not desired to limit this application for patent, to this particular form, in any way, otherwise than limited by the prior art, as it is appreciated that other constructions could be used, that would employ the same principles and come within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. A mechanical tooth brush comprising in combination, a hollow shell adapted with an exterior surface for manual manipulation, said shell having a partition plate transversely across it interiorly and with one end portion restricted to form a stuffing-box-like passage therethrough, and its other end portion closed in, a shank for a tooth brush passing through the said passage into the casing and through the partition plate, a reciprocable disc mounted on the end portion of the shank inside the casing and spaced away from the said partition plate, a collar on the shank adjacent to the said first mentioned end portion, a spring on the shank mounted between the collar and upper side of the partition plate with its respective ends fastened to the shank and the partition for tensioning the shank and its disc resiliently in position, a rotative motor within the casing and rigidly attached thereto, a mechanism for transmitting the rotative action of the motor to a point adjacent the said disc, a rotative disc mounted on the said mechanism and restrained from longitudinal movement with respect to the shell, means on the rotative disc adapted to engage the reciprocable disc in a predetermined manner for intermittently moving the same against and with the tension of the spring, and transmitting the movement to the shank for reciprocating same in an intermittent manner, and a brush on the shank outside the casing for cleaning teeth.

2. A mechanical tooth brush of the class described comprising in combination, a hollow shell adapted with an exterior surface for manual manipulation, said shell having a partition plate transversely across it interiorly and with one end portion restricted to form a stuffing-box-like passage therethrough, and its other end portion closed in, a shank of rectangular cross section for a tooth brush passing longitudinally through the said passage into the hollow portion of the casing and through the partition plate transversely, a reciprocable disc mounted on the end portion of the shank inside the casing and parallel to and spaced away from the said partition plate, a collar on the shank disposed adjacent to the said first mentioned end portion, a spring on the shank mounted between the collar and upper side of the partition plate with its respective ends fastened to the shank and the partition for tensioning the shank and its disc resiliently in position, said end portion first mentioned and the partition plate forming journals to support and guide the shank beyond both end portions of the spring, a rotative motor within the casing and rigidly attached thereto, a speed reduction mech-

anism for transmitting the rotative action of the motor to a point adjacent the said disc, a rotative disc mounted on the said mechanism and restrained from longitudinal movement with respect to the shell, means on the rotative disc adapted to engage means predeterminedly disposed on the reciprocable disc in a predetermined manner for intermittently moving the same against and with the tension of the spring, and transmitting the intermittent reciprocating movement to the shank for reciprocating same

in an intermittent manner, the rectangular shank being so arranged with regard to the stuffing-box-like passage and the opening in the partition plate through which it passes as to be kept similarly aligned at all times, a brush on the shank outside the casing for cleaning teeth, and means on the shank adjacent to the brush for aligning the latter in a predetermined manner.

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