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W. C. WHITE ET AL

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TOOTHBRUSH

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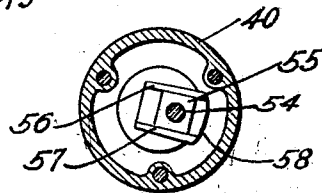
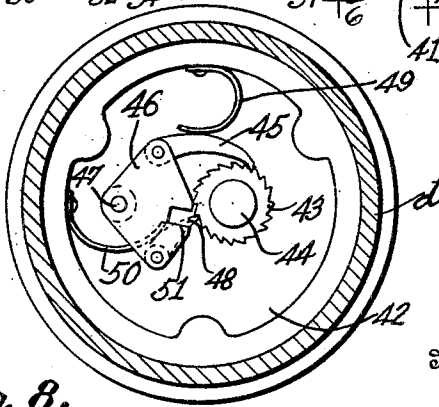
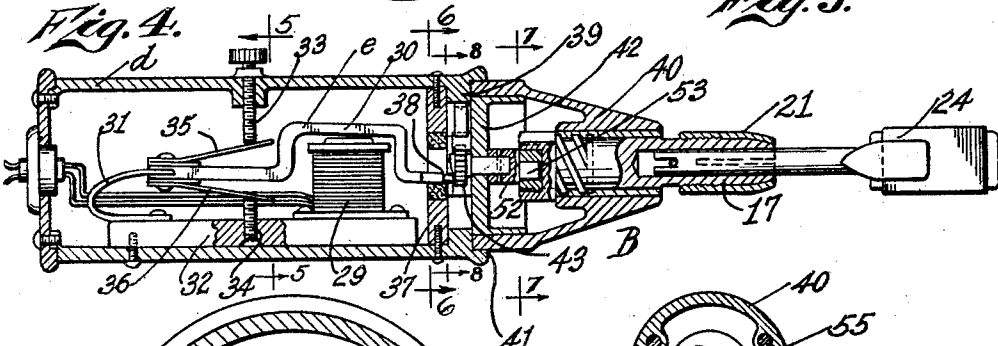
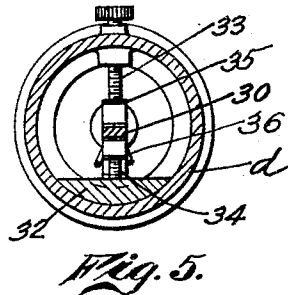
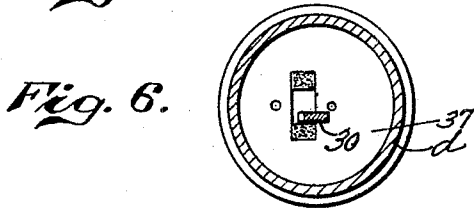
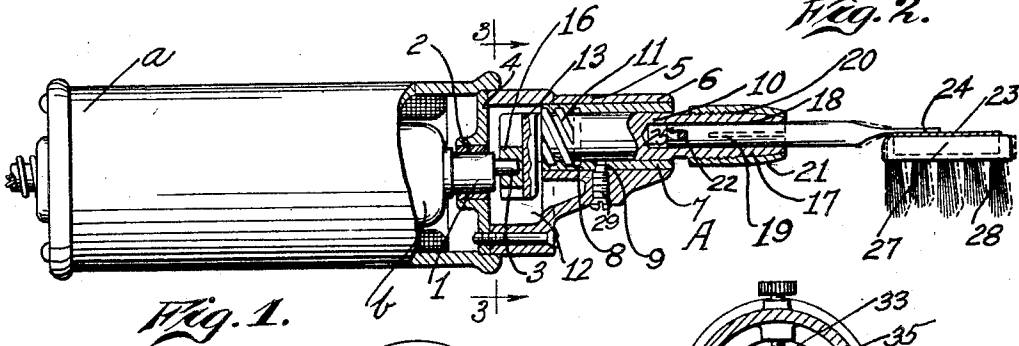
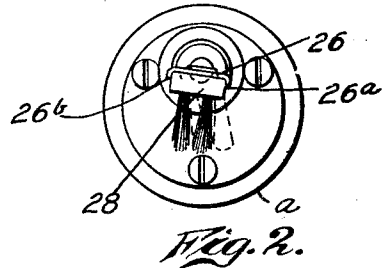
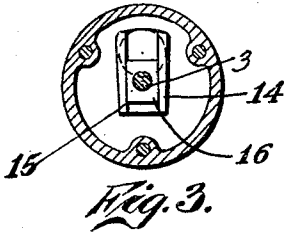


Fig. 8.

Fig. 7.

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UNITED STATES PATENT OFFICE

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TOOTHBRUSH

Application filed March 14, 1930. Serial No. 435,789.

This invention relates to improvements in tooth brushes, and has for an object the provision of a tooth brush which has its parts so constructed and arranged that the brush is adapted to give a gentle massage to the gums during a cleansing of the teeth. The tooth brush likewise is so formed and actuated as to directly contact with all crevices between the teeth for the proper removal of deleterious substances.

With this invention, we have provided a tooth brush wherein the brush is adapted to have transverse oscillation, the result being that the user of this brush need only hold the brush against the teeth in order to derive all the benefits as above set forth in the objects.

Other objects of the invention will appear as the specification proceeds, among which objects is the provision of a tooth brush which is simple of construction, inexpensive of manufacture, and superior to any hand tooth brush.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, construction, association, and relative arrangement of parts, members and features, all as shown in certain embodiments in the accompanying drawing, described generally, and more particularly pointed out in the claims.

In the drawing:

Figure 1 is a side elevation, partly in section, showing one form of the improved tooth brush,

Figure 2 is an end elevation looking in the direction of the brush head,

Figure 3 is a cross sectional view on the line 3—3 of Figure 1,

Figure 4 is a longitudinal sectional view of a modified form of the tooth brush.

Figure 5 is a sectional view on the line 5—5 of Figure 4,

Figure 6 is a sectional view on the line 6—6 of Figure 4,

Figure 7 is a sectional view on the line 7—7 of Figure 4, and,

Figure 8 is a sectional view on the line 8—8 of Figure 4.

Referring now with particularity to the

drawing, that form of tooth brush taken as an entirety and shown in Figure 1 is designated as A, and the form in Figure 4 as B. Both forms have many elements in common although one form A utilizes a motor and the form B utilizes a vibrator. However, the result accomplished by both forms is identical.

The form A will be first described. The casing *a* is adapted to house any form of motor *b*, the shaft of which is secured to a block which is adapted to rotate in a suitable bushing 2, and this block carries an eccentric pin 3. A member 4 is secured to the casing at an end thereof, this member having a central opening for receiving the bushing 2, and to the member 4 is secured a further housing or casing 5 for housing other elements of the invention. This casing or housing 5 is provided with an elongated portion 6 within which is an annular bushing 7. This annular bushing is provided with internal screw-threads 8 and likewise transversely slotted at 9. Received within the said bushing is a shaft 10. This shaft is provided with external screw-threads 11 adapted to cooperate with threads 8 of the bushing 7 and one end of said shaft within a chamber portion 12 of the housing or casing 5, carries a guide 13. This guide includes a pair of spaced members 14 and 15, between which is a block 16, the said block being carried upon the stud 3. It will be noted that the guide 13 depends from the shaft 10. The shaft 10 extends beyond the bushing 7 and its housing 6, as shown at 17, and the shaft is centrally bored at 18, and likewise diametrically split as shown at 19. The portion 17 is externally threaded at 20 and adapted to receive a compressing cap 21. In other words, the external diameter of the shaft adjacent the split portion varies more or less progressively and the cap when secured to the screw-threads, compresses this portion of the shaft. A transverse pin 22 spans the bore 18 and within said bore we provide a brush receiving head 23 secured to a stem 24, one end of which stem is bifurcated at 25. The stem is adapted to be received within the bore of the shaft with the pin 22 between the bifurcations 25. The head part 23 includes a base

member 26 and two side pieces 26a and 26b at an angle to said base. The side pieces of the head are preferably made of spring-like material and are adapted to grip the base 27 of a tooth brush 28.

The operation of this particular form of the invention is as follows:

The motor may be battery driven or driven by electric light current and the shaft of the motor will rotate, which in turn will rotate the stud 3 which is in off-center relation or eccentricity to the shaft of the motor. This eccentricity is sufficient to cause the slide block 16 to reciprocate between the guides of the guide block 13, thus creating transverse oscillation of the shaft 10. As the shaft carries threads 11 which are in mesh with the threads 8 of the bushing, the shaft in addition to transversely oscillating will likewise longitudinally oscillate. The bushing is prevented from turning by a screw or similar means 29 received within the slot 9.

The form of the invention B includes a casing *d* within which is adapted to be housed a vibrator *e*. This form of vibrator is adapted to be operated by alternating current, and the same includes an electro-magnet 29 and an armature 30. One end of the armature is secured to a leaf-spring 31, the spring in turn being secured to a base or block 32, being the same base or block that holds the electro-magnet 29. Vibration of the armature is controlled by an adjusting screw 33 and a fixed screw 34, both of which screws are adapted to bear against leaf-springs 35 and 36 secured to the armature 30. No particular claim is made to this construction, as it is of the type that is in ordinary use for vibrators. The casing is provided with an annular end piece 37 and the armature extends partly through the opening thereof, as shown at 38. The casing *d* is formed with an annular inwardly directed flange 39 and a housing 40 is adapted to be secured to the casing *d* and bear against this flange 39, as shown at 41. Secured to the housing 40 is an annular flanged plate 42, and adapted to be interposed between the plate 42 and the end piece 37 is the mechanism depicted in Figure 8. This mechanism includes a ratchet 43 secured to a stud shaft 44, the stud shaft being passed through the annular opening in the plate 42. A pawl 45 is swingingly carried by a plate 46. This plate 46 is spaced from the plate 42 and swingingly carried on a pin 47. Furthermore, the plate 46 carries a further pawl 48. Both pawls are urged into tooth engagement with the ratchet by means of springs 49 and 50. The free end of the armature is received within a slot 51 of the plate 46. The stud shaft 44 is pinned to a member 52. This member is provided with a pin or stud 53 eccentric to the stud shaft 44, and this pin 53 is in turn received within an opening 54 of a slide block 55, this slide block being

received between members 56 and 57 of a guide 58. This guide is identical with the guide shown for the form A, and furthermore the remaining parts of the invention are the same as shown in the form A and, accordingly, like reference characters will be applied. It is realized, of course, that the housing is slightly differently formed but the form is immaterial.

The operation, uses and advantages of this form of the invention are as follows:

Whereas in the form of the invention A the motor reciprocates and longitudinally oscillates the brush head at high speed, the form B reduces the speed of oscillation and reciprocation by the mechanism shown in Figure 8. It will be noted that when the armature is vibrating that the plate 46 is oscillated back and forth about its pivotal point 47. This oscillation actuates the pawls 45 and 48 to cause rotation of the pinion 43. The pinion in turn will rotate the stud shaft 44 and cause rotation of the eccentric stud 53. This stud 53 is free to rotate in the opening 54 of the block 55 and, as a consequence, due to the threaded arrangement between the shaft 10 and the bushing 7, longitudinal oscillation is possible as well as lateral reciprocation or vibration. It is quite evident that by the arrangement shown, the speed oscillation and reciprocation both longitudinally and laterally will depend upon the number of teeth on the ratchet 43. The same system as shown in Figure 8 could be utilized for the form shown in Figure 1.

It is obvious that we have provided a form of tooth brush which is capable of performing a more efficient cleansing operation than by the ordinary manually operated tooth brush. The invention is adaptable to any type of brush or for that matter vibrator. The inventors are aware that numerous vibrators are on the market which simply vibrate, but so far as the inventors are aware, there is no vibrator on the market that is capable of longitudinal oscillation or vibration along with lateral oscillation or vibration.

It is obvious that various changes and modifications and variations may be made in practicing the invention in departure from the particular showing of the drawing and description as given without departing from the true spirit of the invention.

We claim:

1. In a device of the character disclosed, a shaft provided with screw-threads, a brush head, means on said shaft for detachably securing a brush head, the opposite end of said shaft being provided with a guide member, a slide block for said guide member, propulsive means for reciprocating said slide block relative to the guide, and a screw-threaded bushing in engagement with the threads of the shaft and whereby when the slide block is moved, the shaft is laterally and

logitudinally oscillated to in turn oscillate the head.

2. In a device of the character disclosed, a propulsive element, a plate adapted to be
5 oscillated by movement of said propulsive element, said plate carrying a pawl and a ratchet adapted to be turned by said pawl when the plate is vibrated, a head, and means of
10 connection between said head and the ratchet shaft whereby rotation of said ratchet shaft produces longitudinal and lateral oscillation of the head.

In testimony whereof, we have signed our names to this specification at Los Angeles,
15 California, this 24th day of February, 1930.

WILLIAM C. WHITE.
WILBUR D. McCRAY.

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