

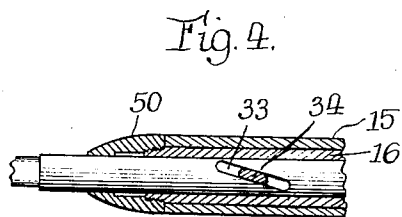
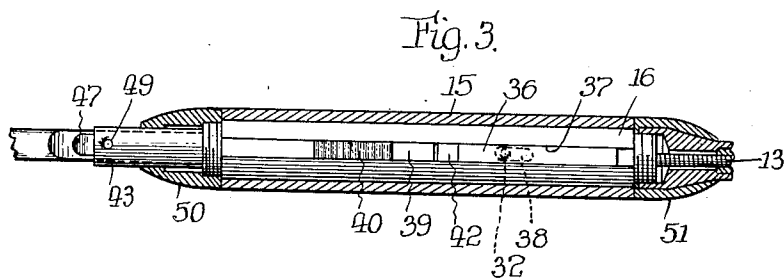
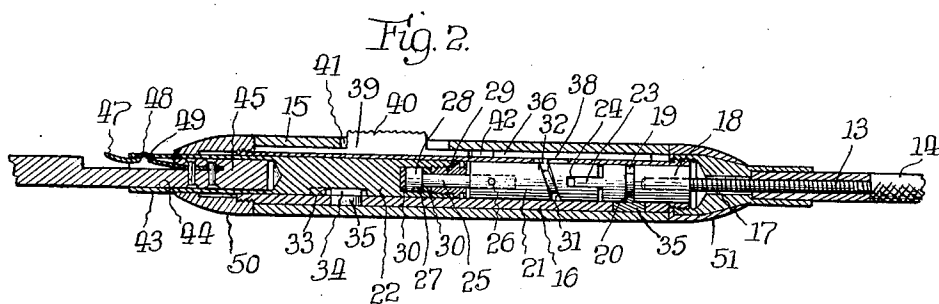
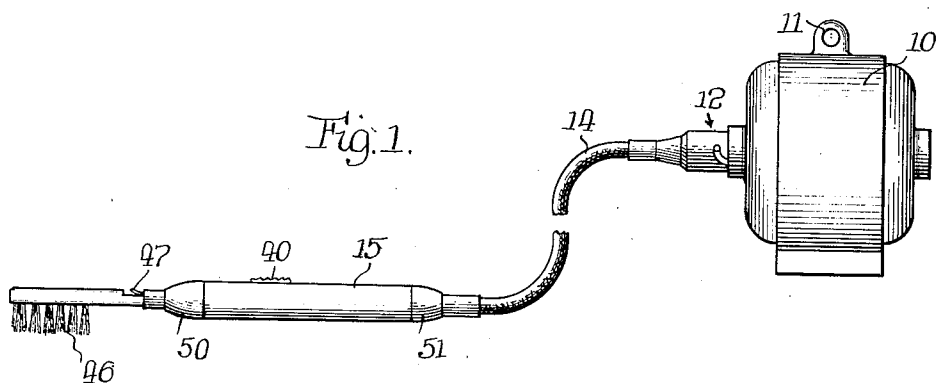
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DENTAL DEVICE

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DENTAL DEVICE

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7 Claims. (Cl. 128-62)

The invention relates generally to a dental device and more particularly to a device especially adapted for treating the gums.

An object of the invention is to provide a novel device of this character by which a message or the like may be properly and conveniently applied to the gums to produce and maintain a healthy condition thereof.

Another object is to provide a new and improved device capable of producing and transmitting to the gums through a suitable applicator, such as a tooth brush, a stimulating vibratory massage.

More specifically stated, other objects reside in the provision of a new and improved device of this character in which the massaging motion is reciprocatory and oscillatory, which embodies simple and efficient means for producing such motion, which includes a novel arrangement whereby the operator or user may start and stop said motion at will, and which may be manufactured and sold at a low cost for distribution to individuals or families for home use.

A further object is to provide an improved tooth brush for use with a device of this character embodying simple means for detachably connecting the brush to the driving means so that the brushes of several individuals may be used with a single driving means.

Other objects and advantages will become apparent in the following description and from the accompanying drawing, in which:

Figure 1 is an elevational view on a reduced scale of a device embodying the features of the invention.

Fig. 2 is a longitudinal section through the device, a part of the section being taken on the axis.

Fig. 3 is a sectional view looking downwardly of the device as shown in Fig. 2, the outer casing only being in section.

Fig. 4 is a bottom view of the left-hand end of the device as seen in Fig. 2 with the outer casing in section.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Generally the mechanical organization of the

device embodies a suitable source of power, such as a motor, drivingly connected with a power translating device which is mounted in a hand-piece dimensioned for convenient manipulation by the operator. In the present embodiment, the power translating device changes a rotary motion derived from the motor into a combined reciprocatory and oscillatory movement which is transmitted to a gum treating or massaging implement, such as a tooth brush. The vibratory and oscillatory movements preferably are short, rapid, and relatively sharp so that the brush has what may be considered generally a circular vibratory movement, although the characters of the different strokes are definitely maintained. Suitable means are preferably included in the device for manipulation by the operator in control of the driven movement of the brush. The tooth brush or other implement has a detachable connection with the device as a whole so that a single driving unit may be used by a number of different individuals.

Referring particularly to the drawing, in which a preferred form of device embodying the invention is shown merely for illustrative purposes, designates a driving motor which may, if desired, be provided with such means as an eye 11 for supporting the motor in any convenient position. The armature of the motor, through suitable connections generally designated 12, is drivingly connected with a flexible power transmitting element or shaft 13 (Fig. 2) housed within a flexible tubular guide 14. The outer end of the flexible shaft 13 is connected with the power translating device which is mounted within a relatively small elongated casing 15, the dimensions of which are such that the device may be easily handled by the user.

The construction and assembly of the power translating device and casing may best be seen in Figs. 2, 3 and 4. Within the casing 15 is a snugly fitting tubular barrel 16 which is approximately coextensive with the casing. At one end, the barrel has screw threaded engagement with a guiding element 17 constituting a bearing for the outer end of the flexible shaft 13. The end of the flexible shaft extends beyond the element 17 into the barrel 16 and is there rigidly connected with a driving member 18 journaled in the end of the barrel. The driving member 18 has an annular groove 19 therein engageable by a pin which is rigid with the barrel 16 said pin and groove being for the purpose of securing the driving member 18 against axial movement in the barrel.

The power translating device proper comprises

in this instance a cylindrical member formed of two sections 21 and 22 dimensioned snugly to fit within the barrel yet movable relative thereto. One of the sections, in this instance the inner section 21, is drivingly connected, as by means of a tongue 23 and slot 24 arrangement, with the driving member 18 whereby the parts rotate conjointly yet may have relative axial movement.

The outer or end section 22 is connected with section 21 for relative rotational but non-axial movement. A preferred connection comprises a pin 25 rigidly secured, as at 26, to the section 21 and extending axially therefrom into an end recess 27 in the section 22. An enlarged head 28, fitting snugly within the recess 27, is held against axial movement relative to the section 22 by a tubular nut 29 screw threaded into the section 22. Preferably fibrous, anti-noise washers 30 are interposed between the head 28, the base of the recess 27, and the end face of the nut 29.

The rotational movement of the driving member 18 is translated into reciprocatory movement by cam means herein shown as comprising an annular cam groove 31 formed in the section 21 and a cam follower 32 on the barrel, the construction of which will be presently described. When the cam follower 32 is stationary with respect to the barrel 16, it will be apparent that rotation of the section 21 will cause said section to reciprocate and, through the axially rigid connection, produce reciprocation of the section 22 as well.

Oscillatory movement is preferably produced in the section 22 by cam means best seen in Figs. 2 and 4. 33 designates an elongated cam slot formed in the section 22 for engagement by a cam follower 34 fixed on the barrel 16. The cam slot 33 extends generally longitudinally of the section 22 but is angular with respect to the axis of said section so that, as the section reciprocates due to the engagement between the cam groove 31 and follower 32, the engagement between the cam slot and follower 34 causes the section 22 to oscillate or rock.

Preferably the cam follower 34 and the pin 20 are mounted on plates 35 fitting snugly and detachably in apertures provided in the barrel 16 whereby to facilitate assembly of the device.

The means by which the user may control the operation of the device includes, in the present instance, what may be termed a clutch device acting upon the cam follower 32. With particular reference to Figs. 2 and 3, the cam follower 32 is fixed to an elongated slide 36 which is seated in a narrow recess 37 extending longitudinally of the outer surface of the barrel 16. A slot 38 in the barrel 16 permits engagement between the cam follower 32 and the cam groove 31, said slot being elongated to allow the follower and slide to reciprocate unless the parts are held against movement. Also seated in the elongated recess 37, in end to end relation with the slide 36, is a control bar 39 having thereon a finger piece 40 which extends outwardly through an elongated aperture 41 in the casing 15 for convenient engagement and manipulation by the user.

The arrangement of parts is such that the control bar 39 may by proper manipulation be moved into engagement with the end of the slide 36 to hold the slide firmly against movement by the engagement between the cam follower 32 and cam groove 31. When the slide is so held, the section 21 will reciprocate. Upon release of the control bar 39, the slide 36 is free and will reciprocate in the slot 37 since the slide and cam follower 32 are of relatively small mass as compared with that

of the power translating device. Preferably, a noise-absorbing washer 42 of fibre or the like is interposed between the adjacent ends of the control bar 39 and slide 36.

The outer end of the section 22 extends beyond the barrel 16 and casing 15, as shown at 43, and this end of the section has an axial recess 44 therein to receive the end 45 of a dental instrument such as the tooth brush 46. Preferably the implement carries a spring clip 47 having a nib 48 thereon engageable in an aperture 49 in the extension 43 for detachably securing the parts together.

The front end of the barrel has a tapering sleeve 50 screw threaded thereon, the outer surface of which is flush with the casing surface and pleasingly finishes the assembly. A similarly-shaped part 51 is fixed about the guiding element 17 at the other end of the casing. The guiding element assembly and sleeve 50 serve to bind the casing therebetween and thus secure the barrel and casing firmly together.

It will be evident from the foregoing that an improved dental device has been provided by which the gums may be properly treated or massaged to produce the desired tough and healthy condition thereof. It is preferred that the brush have a movement which is the resultant of the reciprocatory and oscillatory movements, since the gums are thereby treated with a simulated rotary motion. The device is exceedingly convenient to use and permits a patient, whose gums have a tendency towards such diseases as pyorrhea, to treat himself regularly at home. The simple mechanism for controlling the operation of the device is advantageous, since the tooth brush may be caused to reciprocate and oscillate only while it is in the mouth. The entire mechanism is efficient in operation, simple and compact in construction, and may be manufactured and sold at a comparatively low cost.

I claim as my invention:

1. In a gum treating device, the combination of a casing, a tubular barrel fixed in said casing, an elongated sectional member movably mounted in said barrel, means connecting the sections of said member for relative rotational movement, a rotating driver, means connecting said driver with one of said sections for conjoint rotational and relative axial movement, an annular cam groove in said last mentioned section, a part movable with respect to said barrel having a cam follower engaging said groove to produce relative reciprocation between said part and section, manually controllable means for preventing relative movement of said part and barrel to effect reciprocation of said section relative to said barrel, cooperating cam means on the other section and said barrel for producing an oscillatory movement of said section, said last mentioned section having an axially recessed end, and a tooth brush detachably secured in said recess.

2. In a gum treating device, the combination of a casing, a tubular barrel fixed in said casing, an elongated sectional member movably mounted in said barrel, means connecting the sections of said member for relative rotational movement, a rotating driver, means connecting said driver with one of said sections for conjoint rotational and relative axial movement, an annular cam and cam follower connection between said barrel and the driven section to produce reciprocation of said section, a longitudinal and angular cam and cam follower con-

nection between the other section and said barrel for producing a relative oscillatory movement of said section, and means for connecting an operating implement to said last mentioned section.

3. In a gum treating device, the combination of a casing, a tubular barrel fixed in said casing, a member movably mounted in said barrel, a rotating driver, means connecting said driver with said member for conjoint rotational and relative axial movement, an annular cam groove in said member, a part movable with respect to said barrel having a cam follower engaging said groove to produce relative reciprocation between said part and member, manually controllable means for preventing relative movement of said part and barrel to effect reciprocation of said member relative to said barrel, and means for connecting an operating implement to said member.

4. A tooth and gum massaging device comprising, in combination, a supporting member adapted to be stationarily held in the user's hand during operation of the device, rotary drive means, an applicator, power translating mechanism in said supporting member connected in interposed relation with said drive means and with said applicator for converting rotary movement of the said drive means into a combined driven reciprocation of said applicator along its axis and rotary oscillation of said applicator about its axis.

5. In a device of the character described, the combination of a casing adapted to be conveniently held stationarily in an operator's hand during use of the device, an applicator, rotary

drive means, power translating means in said casing connected with said drive means and with said applicator for converting rotary motion of said drive means into oscillatory movement of said applicator about the longitudinal axis of said applicator.

6. A tooth and gum massaging device comprising, in combination, an elongated tubular casing adapted to be held stationarily in an operator's hand during use, a rotary driver entering one end of said casing, a rotatable member in said casing connected with said driver and including cam means for reciprocating said member upon rotation thereof, a second rotatable member in the other end of said casing, including cam means for oscillating said second member about its axis upon reciprocation thereof, an applicator extending beyond the last mentioned end of said casing and connected with said second rotatable member, and means connecting the two rotatable members for relative rotational and conjoint longitudinal reciprocatory movement.

7. In a device for treating the teeth and gums, the combination of a barrel, a member movably mounted in said barrel comprising aligned sections having a swivel connection, means interposed between one section and said barrel for relatively reciprocating said section upon rotation thereof, driving means for rotating said section, means interposed between the other section and said barrel for rocking said section about its axis as said section reciprocates with the first mentioned section, and an applicator connected with the rocking section.

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