

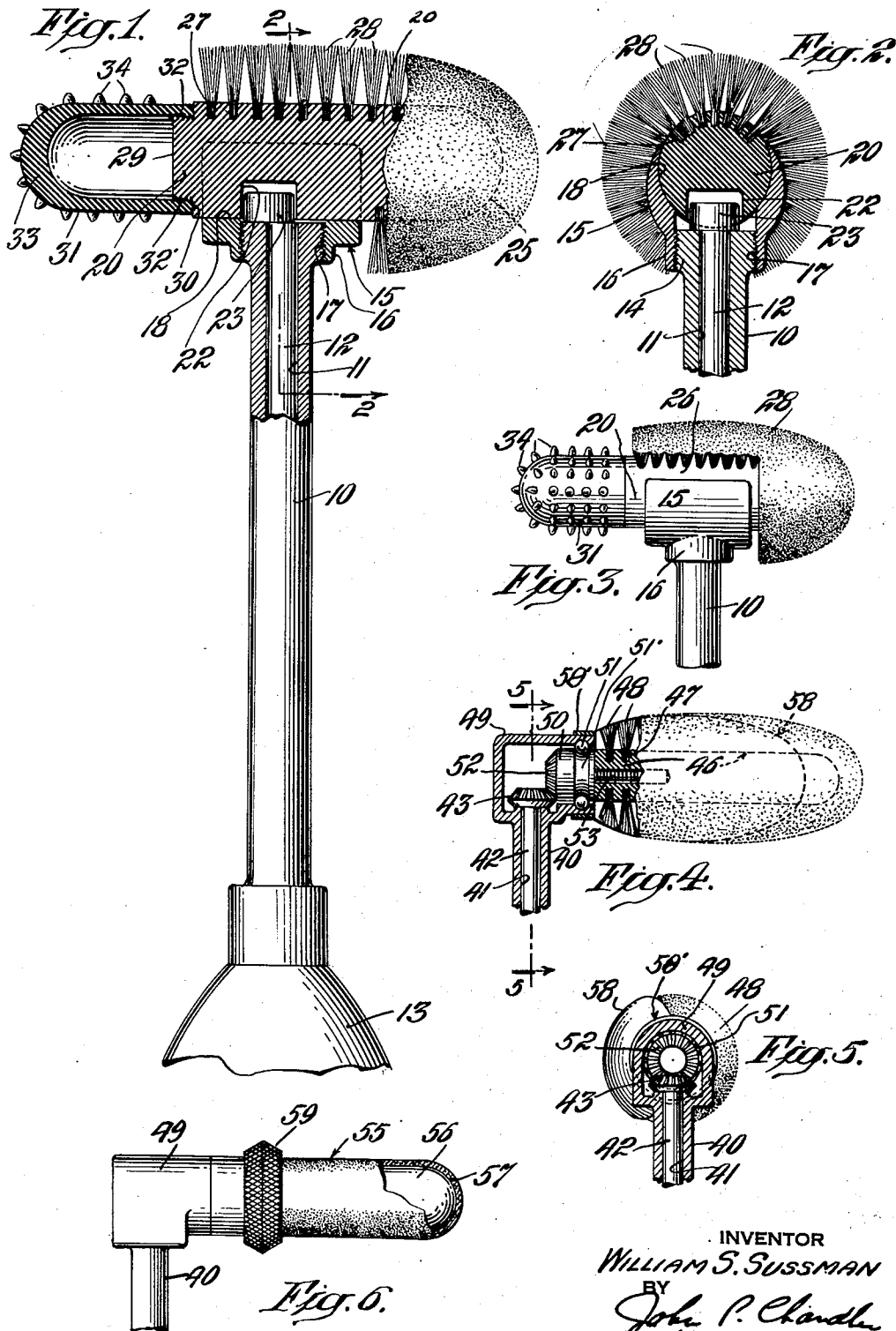
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W. S. SUSSMAN

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MECHANICAL BRUSHING DEVICE

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INVENTOR
WILLIAM S. SUSSMAN
BY
John P. Chandler
his ATTORNEY

UNITED STATES PATENT OFFICE

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MECHANICAL BRUSHING DEVICE

William S. Sussman, New York, N. Y.

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4 Claims. (Cl. 15-22)

This invention relates to a mechanical brushing device and relates more particularly to an improved motor driven brush for cleaning the teeth, for massaging the gums, and for other purposes.

One of the important objects of the invention is the provision of an improved brushing device principally for the teeth and gums which may be used by the layman without possibility of injury to himself.

Another object of the invention is to provide a mechanical toothbrush which will enable the user to obtain a really effective cleaning, thus eliminating the necessity requiring a periodic professional cleaning for the purpose of removing accumulated tartar and other material which cannot be removed by an ordinary daily brushing operation with a conventional brush.

A still further and important object of the invention is to provide a novel and effective brushing apparatus which will clean both inner and outer tooth surfaces, as well as the recesses in such surfaces, with equal facility and will also remove the accumulated material from the interstices between such teeth.

Yet another object of the invention is the provision of an improved device of this character which may be used for brushing the teeth and gums as well as for manicuring purposes, means being provided for polishing the surface of the finger nails as well as for filing the edges thereof.

The invention includes a substantially cylindrical support or core having bristles secured within apertures in the surface thereof, such core being mounted in a journal member having a rotatable shaft leading thereinto. In the preferred embodiment of the invention an eccentric driving cam is secured to the upper end of such shaft, the cam being positioned in an aperture formed in the core. As the shaft rotates the core and its bristles are given an elliptical movement, thus giving a true brushing effect. In the second embodiment of the invention the shaft is provided with a concentric driving gear adapted to impart rotative movement to the brushing element. In each instance such brushing element may be removed and a polishing element, covered with chamois skin or the like, may be substituted.

Another important object of the invention is the provision of means for mounting the brushing element relative to the motor housing in such a manner as to permit free use of the brushing element without interference from the housing.

The preferred prime mover for operating the drive shaft is a spring motor of the type described

in a co-pending application, although any suitable source of power, such as an electric or pneumatic motor, may be used.

In the drawing:

Fig. 1 is a broken front elevation, partly in section, of the preferred embodiment of the present invention;

Fig. 2 is a transverse, vertical section taken on line 2-2 of Fig. 1;

Fig. 3 is a front elevation of the device;

Fig. 4 is a broken front elevation, partially in section, of a modified embodiment of the present invention;

Fig. 5 is a transverse vertical section taken on line 5-5 of Fig. 4; and

Fig. 6 is a side elevation, partially in section, of a manicuring attachment for the device.

The preferred embodiment of the invention is illustrated in Figs. 1, 2 and 3, and includes an elongated vertical sleeve 10 having a longitudinal bore 11 therethrough, such sleeve being positioned on the upper end of a motor housing 13, and being of such length as to permit free use of the brushing element without interference from the housing. The sleeve 10 is desirably removable from the motor housing, although no details of such connection between sleeve and housing, nor of the motor per se, are illustrated herein since they form no part of the present invention. As was pointed out earlier, however, the motor may be either of the electric or pneumatic type or may be spring driven, and the operative parts are enclosed within the housing which is of such size as to be conveniently held in the hand.

At its upper end the sleeve is formed with an enlarged threaded portion 14 which carries a brushing element support or journal 15 formed with a boss 16 having a vertical threaded aperture 17 therein which receives the enlarged upper end portion 14 of sleeve 10. This support is substantially C shaped in transverse vertical section, the inner or bearing surface 18 describing the arc of a circle and representing an arc of from 200 to 225° of the complete circle.

The brushing element comprises a substantially cylindrical core 20 which may be made from molded plastic material or from metal or wood, as desired, such core being circular in transverse section and being of such diameter as to closely fit the arcuate bearing recess 18 in support 15, the core, however, being capable of both oscillating and reciprocating movement within such support.

The core is further formed with a circular aperture 22 in its lower wall which receives a

driving cam 23 which is rigidly mounted at the upper end of shaft 12 eccentrically thereof. It will be apparent that as shaft 12 rotates there will be imparted to each point on the surface of the core a generally elliptical movement. In other words, as the core reciprocates from left to right it will also oscillate in one direction and as it returns from right to left it will oscillate in the opposite direction and thus the core traverses generally the path of a flattened circle. In the position shown in Fig. 1 the core extends further to the right of center than to the left, and this right terminal is rounded as shown at 25. The surface of the core is formed with a plurality of spaced apertures 27 within each of which are cemented or otherwise secured a series of bristles 28. In order to give the brushing element the maximum brushing efficiency for teeth cleaning purposes, the bristles, after they are secured in place, are trimmed to form the general shape shown in Figs. 1 and 3. The bristles are secured over the greater portion of the surface of core 20 except for a portion designated as 26 which is the bearing surface and which is free from bristles in order to avoid interference with the edges of support 15.

The opposite end of the core 20 is flat as shown at 29 and is formed with a reduced threaded portion 30. A substantially cylindrical massaging member 31, formed with a hardened collar portion 32 having internal threads 32', is mounted on such reduced portion, said member having a closed opposite end portion 33 of somewhat greater thickness than the side walls. The outer surface of the massaging member is rendered non-smooth by the formation of a plurality of spaced protuberances 34. If desired, this massaging member may include a cylindrical core of hard material, which may be an integrally formed extension of the core 20, and a cap of sponge rubber or other resilient material may be removably positioned thereon after the core has been moved into place in the journal member 15.

By forming the annular side walls of massaging member 31 relatively thin and the end wall somewhat thicker, such side walls will yield longitudinally when such end wall engages the gums thus permitting the user to gauge the amount of pressure to be applied.

The massaging member may be rendered non-smooth by the formation of any other type of surface and the member may also have an abrasive portion on its outer surface for use as a manicuring instrument.

The modified embodiment shown in Figs. 4, 5 and 6 includes a sleeve 40 having a bore 41 therein, a rotating shaft 42 driven by suitable power as before, positioned therein, such shaft having a small bevelled gear 43 mounted at the upper end thereof. The core 46 in this instance is also substantially cylindrical in shape and likewise is formed with a plurality of apertures 47 therein, bristles 48 being secured within such apertures. At the upper end of the sleeve 40 a housing 49 is formed, such housing providing a journal for a rotatable hub 50, ball bearings 51 being positioned in an annular recess 51' between hub and journal. A bevelled gear 52 meshes with gear 43. The hub is provided with a screw 53 which is received in a longitudinal recess in the core 46, the thread of screw 53 running in a direction opposite from the direction of rotation of core 46.

The housing further carries curved guard plate 58 having a collar portion 58' which is carried on the housing 49 and may be rotated to any position desired.

In Fig. 6 a manicuring device 55 is illustrated, which device may be mounted on screw 53. This device includes a core 56 having a covering 57 of chamols skin or other suitable material and an annular file 59, substantially triangular in transverse section is also carried on the core.

The brushing element shown in Figs. 4 and 5 may also be modified in the manner suggested for the first embodiment of the invention. Also, the precise shape of such element is a matter of choice.

What I claim is:

1. A mechanically operated tooth brush including a generally cylindrical brushing element comprising a core and a plurality of bristles secured over a portion of the surface thereof, including at least one end wall, a substantially C shaped support for the brushing element having a bore receiving the element to permit movement of the element relative to the support, the core having an aperture in one side wall thereof, and an eccentric cam driver positioned within said aperture to impart oscillating and reciprocating movement to the brushing element, a sleeve carried by the support and a rotatable shaft positioned therein, the cam driver being secured to said shaft, the core of the brushing element having a portion of its surface free from bristles to permit movement of the element relative to the support.

2. A mechanically operated tooth brush including a cylindrical brushing element comprising a core and a plurality of bristles secured over a portion of the surface thereof, a channelled support for the brushing element having a bore shaped to receive the element to permit movement of the element relative to the support, the bore engaging the core over an area less than its entire outer periphery, the core having an aperture therein, and means for imparting oscillating and reciprocating movement to the brushing element comprising an eccentric cam driver positioned in the aperture, a sleeve carried by the support and a rotatable shaft positioned therein, the cam driver being secured to said shaft, the core of the brushing element having a portion of its surface free from bristles to permit movement of the element relative to the support.

3. A mechanically operated tooth brush including an elongated cylindrical brushing element comprising a core formed with a rounded wall at one end thereof and a plurality of bristles secured over a portion of the surface of the core including said rounded end wall, a journal support for the brushing element having a bore receiving the element to permit movement of the element relative to the support, the support engaging the core over more than one-half its outer periphery, the core having an aperture therein, and an eccentric cam positioned within said aperture to impart oscillating and reciprocating movement to the brushing element, a sleeve carried by the support and a rotatable shaft positioned therein, the cam being secured at one end of said shaft, the core of the brushing element having a portion of its surface free from bristles to permit movement of the element relative to the support.

4. A mechanically operated tooth brush including a cylindrical brushing element comprising

an elongated core which is circular in transverse section, and a plurality of bristles secured over a portion of the surface thereof, including one end wall, a support for the brushing element which is substantially C shaped in transverse section and engages the core over an area substantially half its length and more than half its periphery to permit movement of the element relative to the support, the core having a circular aperture therein, a sleeve carried by the 10

support, a rotatable shaft positioned within the sleeve, a prime mover connected with one end of the shaft, and an eccentric cam driver secured at the other end of the shaft and lying in the circular aperture in the core, the core of the brushing element having a portion of its surface free from bristles to permit movement of the element relative to the support.

WILLIAM S. SUSSMAN.