UNITED STATES PATENT OFFICE

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DENTAL PROPHYLACTIC OSCILLATOR

Application filed August 6, 1930. Serial No. 473,892.

This invention relates to a prophylactic oscillator for use by dentists, and the general object of the invention is to provide means for polishing interproximal surfaces of fillings in human teeth; for sawing through contacts, cutting through dental bridges, cutting off or polishing down overhanging or rough interproximal fillings, etc., or for any purpose where sawing, filing, smoothing or polishing is necessary on the teeth in the human mouth. The invention is designed for use by dental hygienists or dentists for polishing, removal of plaques, films, stains, calculus or other foreign substances on interproximal surfaces of the human teeth by mechanical means.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a view showing the device in use.

Figure 2 is a top plan view of the device.

Figure 3 is an elevation with parts in section and parts removed.

Figure 4 is a section approximately on the line 4—4 of Figure 3.

Figure 5 is a section on line 5—5 of Figure 3.

Figure 6 is a view of a saw which may be used with the device.

Figure 7 is a view of the file used with the device.

Figure 8 is a view of an abrasive carrying member used with the device.

Figure 9 is a section on line 9—9 of Figure 2.

Figure 10 is a front view of Figure 9.

Figure 11 is a detail sectional view showing how the tubular stem is interlocked with a part of the gear housing.

Figure 12 is a view of a hand device.

In these drawings, the numeral 1 indicates a housing, the sides of which are closed by the cover plates 2, and said housing is formed with a nipple 3 at its rear end which is threaded to receive a part of a dental machine on which the invention is used as an attachment. A shaft 4 is journaled in the rear end of the housing and is provided with means for attaching it to the shaft of the dental machine and said shaft 4 has a beveled gear 5 attached thereto and located in the housing. This gear meshes with a gear 6 fastened to a transverse shaft 7 journaled in the housing and carrying the eccentrics 8 which are oppositely arranged and each of which is formed with a peripheral groove 9.

An eccentric strap 10 surrounds each eccentric and a set screw 11 is carried by each strap and engages the groove so that the strap is held on the eccentric by the groove. A forwardly extending arm 12 is formed on each strap and the head 13 of a reciprocatory stem 14 is pivoted to each arm. These stems pass through guiding holes 15 in a circular part 16 formed on the front end of the housing. Guiding tubes 17 are connected with the part 16 and these tubes are connected together by the collars 18. The stems 14 pass through these tubes and project from the outermost collar. A tubular member 19 encloses the tubes and the collars and is detachably connected with the part 16 over which it fits by a knurled collar 20 having an internal flange 21 thereon engaging a groove 22 formed at the junction of the part 16 with the housing, said collar receiving a cam collar 23 formed on the inner end of the tubular member 19. The collar carries a pin 24 which engages the cam collar and said cam collar is formed with a notch 25 which, when the collar 20 is moved to a position where the pin is opposite the notch, will permit the member 19 to be withdrawn from the collar 20. A small key 26 on the part 16 fits in the notch 25 and prevents rotary movement of the member 19. A channel shaped cross piece 27 is formed on the outer end of the tubular member 19 and the stems 14 are adapted to move into this cross piece. A pair of disks 28 are pivoted in the cross piece, one at each end thereof, and each disk is...
formed with an arm 29 which is engaged by the outer end of each stem 14 so that the disks will be rocked by the reciprocating stems 14. A second arm 30 is connected with each disk 28 and each arm 30 is formed with the grooved head 31.

A saw blade A, a blade B formed with file teeth and a perforated strip C form part of the device, each of these members having the perforations 32 at its ends for receiving the grooved heads 31. The arms 30 are formed of spring material so that they can be slightly bent and either the saw, file or strip placed on the heads, with portions of the walls of the perforations therein engaging the grooves in the head. Then when the device is attached to a dental machine and the shaft 4 is rotated by such machine, the stems 14 will be reciprocated by the eccentrics and the straps so that said stems will rock the disks and thus cause the arms 30 to oscillate in unison so that the saw, file or strip carried by the arms 30 will be moved back and forth and thus caused to function.

A T-shaped member 33 is adjustably held in a passage 35 passing through one side of the cross piece 27 by a set screw 36 and the head of this T-shaped member has a pair of blocks 37 slidably arranged thereon, the blocks being moved toward and away from each other by a small shaft 38 provided with right and left threaded portions which pass through threaded holes in the blocks. The shaft has a knurled disk 39 at each end thereof and a projection 40 on the T-shaped member engages a groove in the shaft to prevent longitudinal movement of the shaft. Thus by rotating the shaft, the blocks are caused to move toward or away from each other.

Each block carries a hook 41 which is covered by resilient material 42 and these hooks form clamping means for clamping the device to one or more of the teeth so as to hold the device steady while being operated, as shown in Figure 1.

The pivots for the disks 28 are preferably in the form of screws as shown in Figure 2, so that the disks and the arms can be removed when desired and as the parts which come in contact with portions of the mouth or saliva are removable, it is a simple matter to separate the parts for sterilizing purposes.

The knurled collar 20 and its associated parts form a swivel lock for detachably connecting the tubular member 19 to the housing and by removing one of the side plates of the housing, the parts therein can be separated for cleaning or repair purposes. The stems 14 can also be removed by a pair of pliers or the like as they are threaded in the parts 13. The clamp or fulcrum formed by the T-shaped member and the parts carried thereby prevent the device from moving, which might cause the blade to cut into the gum tissues. As before stated, any one of the blades shown in Figures 6, 7 and 8 can be easily and quickly attached to or removed from the instrument by exerting pressure upon the arms 30 so that the perforated ends of the blade can be placed into engagement with the grooved heads 32 or removed therefrom.

That part of the instrument composed of the portions 19, 27, 30 and 33 naturally become contaminated from contact with the oral tissues and saliva, and by turning the collar 20, this contaminated part of the instrument can be separated from the housing part so that it can be easily taken apart and sterilized without affecting the lubricant in the housing.

The perforations in the blade C will carry abrasive substances through the spaces between the teeth, although a smooth blade may be used, if desired. The attachment is preferably connected with the dental machine by a slip joint so that it can be easily and quickly attached to the machine or removed therefrom.

From the foregoing it will be seen that I have provided simple means for carrying out the operations mentioned at the beginning of the specification.

Figure 12 shows a device for using the blades by hand, this device consisting of a handle 43 having a fork 44 at one end, carried by a housing, a shaft therein, oppositely arranged eccentrics carried by the shaft, a pair of stems slidably arranged in the housing, a pair of stems guided in the body and reciprocated by the eccentrics, a pair of cam members pivoted in the outer end of the body and rocked by the arms whereby the blade will be reciprocated by the rocking movements of the cams. It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. An attachment for a dental machine, comprising a body, means for detachably connecting the body to the machine, a shaft journaled in the body and driven from the machine, eccentrics on the shaft, a pair of stems guided in the body and reciprocated by the eccentrics, a pair of cam members pivoted in the outer end of the body and rocked by the arms whereby the blade will be reciprocated by the rocking movements of the cams.

2. An attachment for a dental machine, comprising a supporting member, a pair of disks pivotally carried by it, a handle pivotally carried by each disk, a blade detachably connected at its ends to the arms and means for rocking the disks from the machine.

3. An attachment for a dental machine, comprising a housing, a shaft therein, oppositely arranged eccentrics carried by the shaft, a pair of stems slidably arranged in the housing, a pair of stems guided in the body and reciprocated by the eccentrics, a pair of cam members pivoted in the outer end of the body and rocked by the arms whereby the blade will be reciprocated by the rocking movements of the cams.
one end of the housing, means for reciprocating the stems from the eccentrics, means for rotating the shaft from the machine, a pair of blade carrying members and means for moving the blade carrying members in unison by the stems whereby the blade will be reciprocated.

4. An attachment for a dental machine, comprising a housing, a shaft journaled therein, means for rotating the shaft from the machine, oppositely arranged eccentrics on the shaft, an eccentric strap carried by each eccentric, a pair of stems, guiding means for the same, means for pivotally connecting the stems with the eccentric straps, a tubular member detachably connected with the housing and enclosing the outer portions of the stems and the guiding means, a channel-shaped member arranged at right angles to the tubular member and connected with the outer end thereof, a pair of disks pivoted in the channel member, arms carried by the disks and engaged by the stems, spring arms carried by the disks, a blade detachably connected with the outer ends of the spring arms and adjustable clamping means connected with the outer end of the attachment for clamping a tooth.

5. An attachment for a dental machine, comprising a housing, a shaft journaled therein, means for rotating the shaft from the machine, oppositely arranged eccentrics on the shaft, an eccentric strap carried by each eccentric, a pair of stems, guiding means for the same, means for pivotally connecting the stems with the eccentric straps, a tubular member detachably connected with the housing and enclosing the outer portions of the stems and the guiding means, a channel-shaped member arranged at right angles to the tubular member and connected with the outer end thereof, a pair of disks pivoted in the channel member, arms carried by the disks and engaged by the stems, spring arms carried by the disks, a blade detachably connected with the outer ends of the spring arms, adjustable clamping means connected with the outer end of the attachment for clamping a tooth, such clamping means comprising a pair of blocks slidably supported, means for moving the blocks toward and away from each other and clamping members carried by the blocks.

In testimony whereof I affix my signature.

WILLIAM D. WHITE.