April 9, 1957 C. LATHER ET AL 2,788,000

PORTABLE DENTAL DEVICE

Filed Jan. 27, 1955

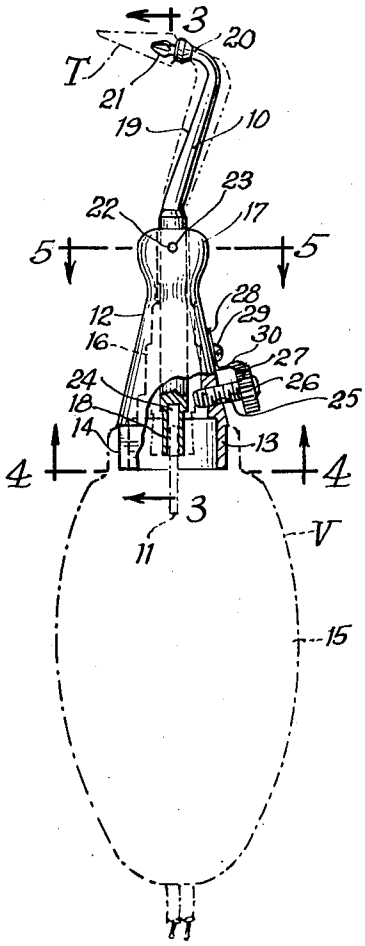


FIG. 1

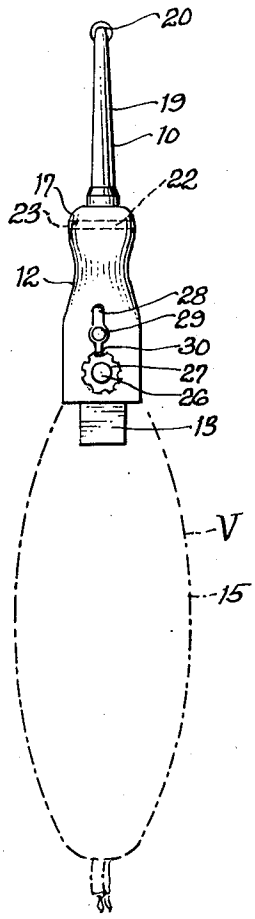


FIG. 2

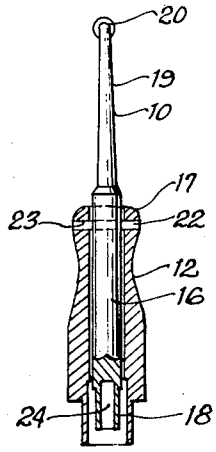


FIG. 3

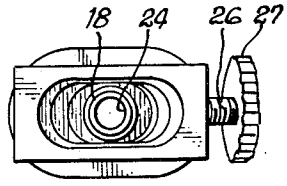


FIG. 4

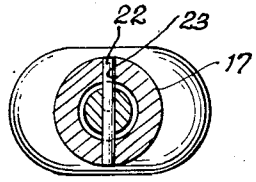


FIG. 5

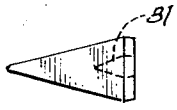


FIG. 6



FIG. 7



FIG. 8



FIG. 9



FIG. 10



FIG. 11

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United States Patent Office 2,788,000 Patented Apr. 9, 1957

2,788,000

PORTABLE DENTAL DEVICE

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Application January 27, 1955, Serial No. 484,478

5 Claims. (Cl. 128—62)

This invention relates to a device for individual use outside of a dentist's office in the treatment of various parts and areas of the mouth to stimulate the circulation of blood for preventing break-down of tissue and for massaging the attached gingiva, the inter-dental papilla and the like portions associated with the gums and the teeth for strengthening and improving the characteristics and the health of the teeth and the gums, and it relates more particularly to a portable device of small dimension and weight that can be employed for individual use in the home or the like as a supplement to dental treatment and in the exercise of certain areas of the mouth to improve their physical well-being, and it is an object of this invention to produce a device of the type described.

These and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawing in which—

Figure 1 is an elevational view of a portable dental device embodying features of this invention;

Figure 2 is a side elevational view of the device shown in Figure 1;

Figure 3 is a sectional view taken along the line 3—3 of Figure 1;

Figure 4 is a sectional view taken along the line 4—4 of Figure 1;

Figure 5 is a sectional view taken along the line 5—5 of Figure 1;

Figure 6 is a side elevational view of one of the attachments adapted for use in the device of Figure 1;

Figure 7 is an end view of the attachment shown in Figure 6;

Figure 8 is another type of attachment adapted to be used with the device in Figure 1;

Figure 9 is an end view of the attachment shown in Figure 8;

Figure 10 is a side elevational view of a still further attachment adapted to be used with the device of Figure 1, and

Figure 11 is an end elevational view of the attachment shown in Figure 10.

Referring now to the drawings, the letter V indicates a vibrator of the conventional type such as is adapted either for mechanical actuation by winding mechanism or electrical actuation which employs magnetic coils which are alternatively made and broken to cause transverse reciprocating motion of a vibrator shaft 11 at high velocity in a fixed path.

An adapter housing 12 dimensioned at its base 13 to be received in fitting relation in the open end 14 of the vibrator housing 15 for rigid attachment, is provided with a bore 16 of increasing dimension from the outer end portion 17 inwardly towards the base 14. The adapter 10 in the form of an elongate rod fabricated of metal or the like rigid material, extends lengthwise through the bore with one end portion 18 in operative

engagement with the vibrator shaft 11 while the other end portion 19 extends outwardly beyond the adapter housing 12 and is formed with a turned end portion 20 having a gripping member 21 on the end thereof adapted to receive various dental tools in mounted relation.

The adapter 10 is supported intermediate its ends on a pivot pin 22 which extends through aligned openings 23 in the end portion of the adapter housing 12 for rocking movement of the adapter with the pin as its pivot. The axis of the pivot pin about which the adapter rocks is in substantial alignment and perpendicular to the direction of the movement of the vibrator shaft 11 located radially thereof when in the mounted relation. The inner end portion 18 of the adapter rod which is operatively engaged with the vibrator shaft 11 is adapted to be independent thereof to the extent that the adapter is able to shift with the vibrator shaft but in varying degree. For this purpose, the inner end portion 18 of the adapter is formed with a slot 24 which receives the outer end portion of the vibrator shaft in operative engagement thereby to impart rocking movement of the adapter back and forth about its pivot pin responsive to reciprocal movement of the vibrator shaft.

Because of the independent connection of the type described between the end of the adapter and the vibrator shaft, it becomes possible to control the extent of rocking movement of the adapter without interfering with the magnitude of the reciprocal movement of the vibrator shaft. For such purposes of control, an opening 25 is provided at a lower portion of the adapter housing in alignment with the adapter rod in the direction of rocking movement. The walls defining the opening are formed with threads for threaded engagement with a bolt member 26 having a knurled head 27 on the end portion thereof extending outwardly beyond the housing for enabling turning movement of the bolt whereby the end of the bolt is displaced in the direction toward and away from the adapter.

Means are provided resiliently to engage the head 27 of the bolt 26 for militating against inadvertent displacement from a set position in use. Conventional means of the type described may be employed, such for example as the spring arm 28 secured to the outer wall of the adapter housing, as by means of a setscrew 29, and having an upturned end portion 30 which resiliently engages the grooves formed in the side walls of the knurled head 27.

The extent to which the end of the bolt projects into the path of the adapter rod 10 influences the pitch and the strength of the vibrations received by the tool T mounted on the free end 21 of the adapter. The magnitude of the vibrations is decreased in response to turning movement of the bolt for displacement of the end farther into the bore and into the path of the adapter rod to the point where the vibrations can be reduced to a very slight movement or hum. By turning movement to displace the end of the bolt outwardly within the adapter housing, the magnitude of the vibrations is increased to the maximum which would be provided by the vibrator shaft without obstructions in the path of the adapter rod which would limit rocking movement thereof.

In Figures 6–11 of the drawing, illustration is made of some of the tools which may replaceably be mounted on the end of the adapter for effecting desired dental treatments, preferably under medical advisement. Each of the tools are formed with a cavity 31 in the base dimensioned to receive the spear 21 on the end of the adapter in fitting relation securely to mount the particular tool for operation on the end of the adapter.

For massaging the inter-dental papilla, use is preferably made of the conically shaped triangular pyramidal

tool, illustrated in Figures 6 and 7. For treatment of the inter-dental papilla with a tool of the type described, it is desirable to provide a low degree of vibrational movement. Thus, when the tool is employed for this purpose, the device is adjusted in advance to displace the end of the bolt **25** farther into the path of the adapter to reduce the magnitude of rocking movement thereof to the desired amount.

The rounded rubber-like tool member, illustrated in Figures 10 and 11, is employed chiefly for massaging the attached gingiva and the alveola muscosa. For such applications, marked stimulation is desired. This may be selectively obtained by turning the head **27** in the direction to displace the bolt **25** outwardly in the direction away from the adapter until the desired increase in the amount of rocking movement of the adapter is secured.

For massaging the attached gingiva, use is also made of a tool in the form of a rubber cup, illustrated in Figures 8 and 9, with the adapter set for vibration in amounts intermediate between the two settings previously described.

Such flexibility in operation of a device of the type described permits the use of but a single unit for various purposes prescribed for dental treatment. With the means for holding the adjusting element in a predetermined position, it becomes possible for the device to be set by one's dentist for use in the home or away from the dentist's office to effect prescribed dental treatments.

Use of the device for general massaging purposes has also been found beneficially to increase blood circulation thereby to make more oxygen available for carrying off such by-products as folic acid which otherwise accumulates and accelerates break-down of tissue.

It will be apparent from the foregoing that I have provided a new and improved device capable of use in dental treatments and in which the device embodies sufficient flexibility in operation for varying the magnitude of vibratory movement to enable use of the device for various types of treatment as distinguished from the necessity of separate devices for particular applications. Such separate device for individual use would render home treatment expensive and incapable of adoption by a large percentage of the people that might benefit therefrom.

Such flexibility in a device of the type described depends in part upon the described independent mounting of the vibrator element for rocking movement in response to actuation by a vibrator member having constant movement but which is sufficiently independent thereof to enable adjustment in the rocking movement of the adapter notwithstanding the constant movement of its driving member.

It will be understood that changes may be made in the details of construction, arrangement and operation and in the various tools adapted for use on the end of the vibrator member for such dental purposes and for other similar operations without departing from the spirit of the invention, especially as defined in the following claims.

We claim:

1. A portable dental device comprising a vibrator having a shaft extending outwardly from one end thereof mounted for reciprocal movement at high speed in a linear path during operation, an adapter housing extending outwardly from the end of the vibrator, an elongate adapter rod pivoted intermediate its ends on an outer end portion of the adapter housing for rocking movement about an axis perpendicular to the direction of movement of the vibrator shaft, means at one end lying in the path of the vibrator shaft but disengaged therefrom for transmitting rocking movement of the adapter rod about its pivot in response to reciprocal movement of the vibrator shaft, means on the other end of the adapter rod for mounting a dental tool, and means operatively engaging the adapter rod offset from its pivot for controlling the extent of rocking movement independently of the extent of movement of the vibrator shaft.

2. A portable dental device comprising vibrator means including a vibrator shaft having a relatively constant magnitude of reciprocal movement along a linear path during operation of said vibrator means, an adapter housing extending outwardly from the vibrator means and having a bore extending therethrough in alignment with the vibrator shaft, an elongate adapter rod extending through the bore and pivotally mounted intermediate its ends on an outer portion of the adapter housing for rocking movement about an axis perpendicular to the line of movement of the vibrator shaft, an operative connection between one end of the adapter rod and the vibrator shaft for transmitting reciprocal movement of the shaft to rocking movement of the rod independently of one another, means on the other end of the rod for mounting a dental tool, and means shiftable through the housing into and out of the path of the rod for adjusting the extent of rocking movement of the rod relative the extent of reciprocal movement of the driving shaft.

3. A portable dental device as claimed in claim 2 in which the operative connection between the vibrator shaft and the adapter rod comprises an opening in the end of the rod in which the free end of the vibrator shaft is loosely received.

4. A portable dental device as claimed in claim 2 in which the means shiftable through the housing for varying the extent of rocking movement of the adapter rod comprises an elongate threaded member extending through a threaded opening in the housing in alignment with the rod in the direction of rocking movement and means on the end portion of the member outside of the housing for turning movement of the member whereby the other end of the member is displaced radially into and out of the path of the rod.

5. A dental device as claimed in claim 4 in which the elongate threaded member extends through an opening in the housing for engagement of the rod in an area intermediate the end of the rod and its pivot.

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