

[54] DENTAL HYGIENE DEVICE

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[58] Field of Search **128/62 A, 66, 65, 67, 232**

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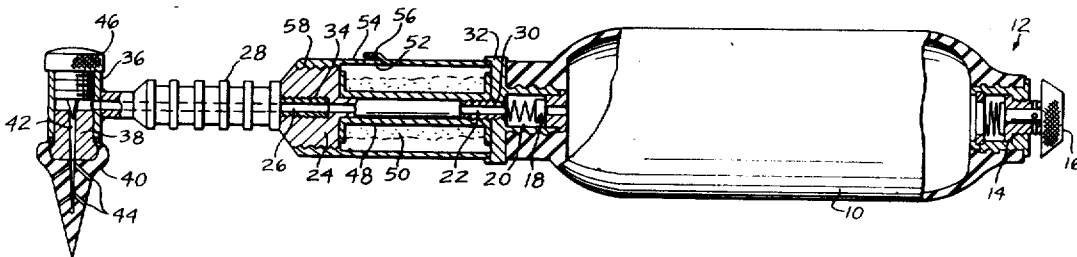
Primary Examiner—L. W. Trapp

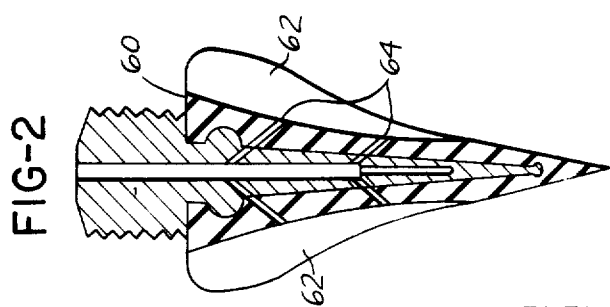
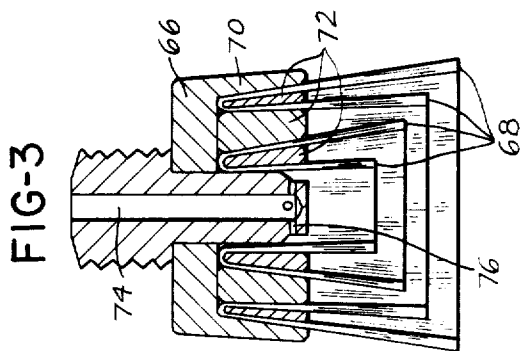
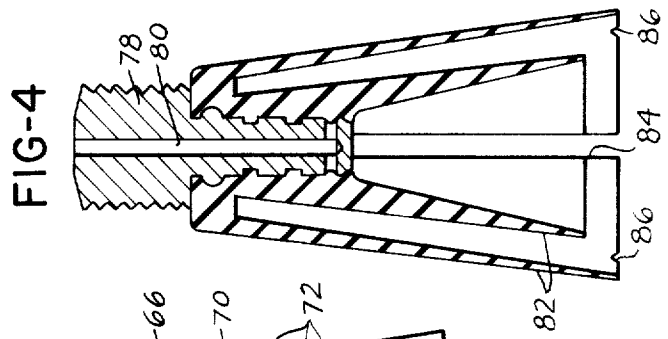
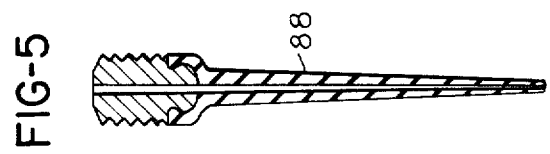
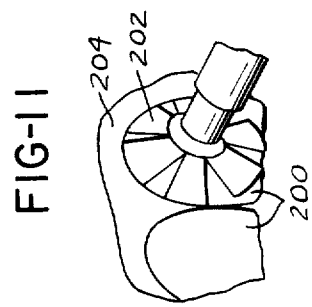
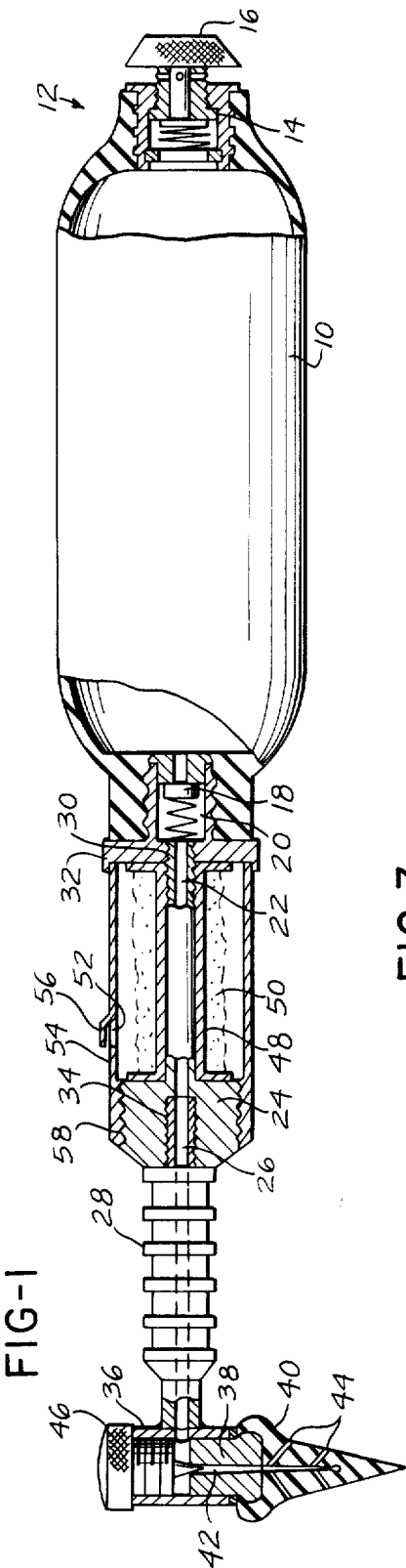
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[57] ABSTRACT

A device for use in oral and dental hygiene, wherein a tooth engaging element in the form of a bristle brush, or rubber-like member, is mounted on a hand graspable holder and the holder is arranged to supply fluid under pressure to the tooth engaging element, either from a pressurized source or by means of a manually operable bulb in fluid communication with the tooth engaging element. The specification also discloses an arrangement whereby the tooth engaging element can be rotated if so desired.

2 Claims, 11 Drawing Figures





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FIG-6

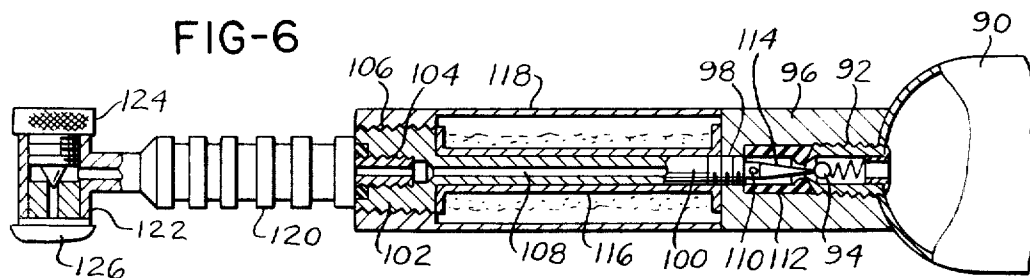


FIG-7

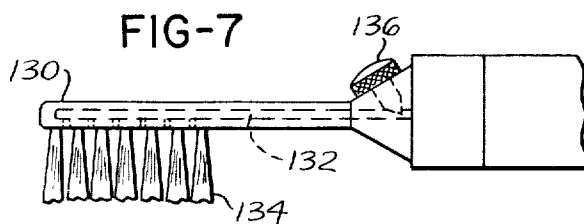


FIG-8

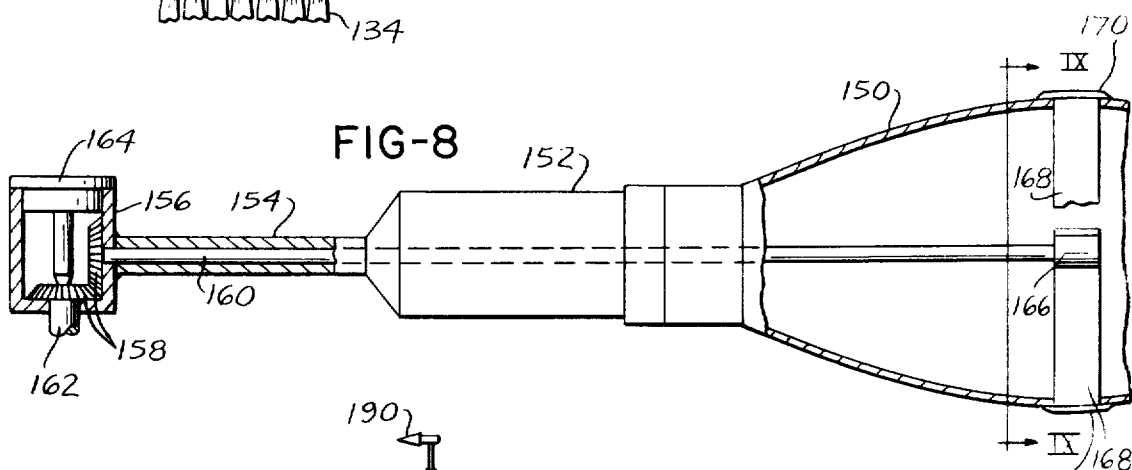


FIG-10

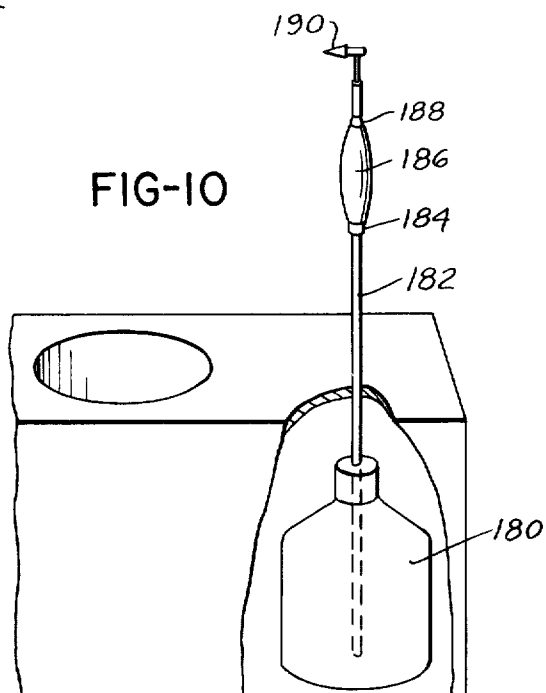
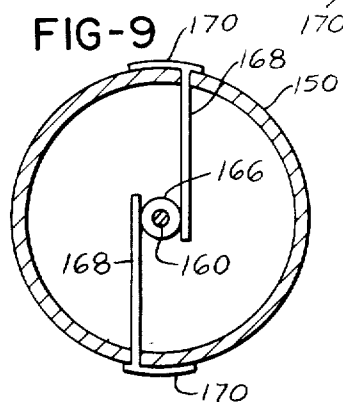


FIG-9



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DENTAL HYGIENE DEVICE

The present invention relates to a dental or oral hygiene device and especially to such a device for accomplishing a wide variety of oral and dental hygienic operations and without the use of an external power source.

Dental and oral hygienic devices are known but, heretofore, have been relatively ineffective and limited in scope and, furthermore, when of an effective nature for such purposes as cleaning between the teeth, have required an external source of power, or a supply of liquid under pressure, such as water taken from the water mains in an establishment.

Devices which require an external source of power, such as water under pressure, or a source of electricity, are thus useful only when such sources are available and, accordingly, the area of usefulness of the devices is severely limited.

It is also the case, as mentioned, that devices according to the prior art have tended to be more or less single purpose devices and have not met the wide range of oral and dental hygienic needs it is desired to fill.

With the foregoing in mind, it is a primary object of the present invention to provide a device for dental and oral hygienic purposes which can accomplish a wide variety of operations, including the thorough cleaning of teeth and the space between the teeth and the surfaces of the teeth beneath the edges of the gums which ordinarily are quite difficult to clean by any conventional method other than those employed by dentists in their offices.

A further object of this invention is the provision of a device of the nature referred to which requires no external power source and is, therefore, readily portable and can be used anywhere.

A still further object of the invention is the provision of a device of the nature referred to which is small enough to be carried about in the pocket or in a purse.

Still another object of this invention is the provision of a device of the nature referred to which can contain liquid, but which is so constructed that leakage of the liquid is prevented.

A still further object of the invention is the provision of a device of the nature referred to that can clean the teeth beneath the gums at the edges and which will polish the teeth even down to the portion thereof under the edges of the gums.

The foregoing objects, as well as still other objects and advantages of the present invention will become more apparent upon reference to the following detailed specification taken in connection with the accompanying drawings in which:

FIG. 1 is a side view, partly in section, showing one form of the device according to the present invention;

FIG. 2 shows a modification of the tooth engaging implement of FIG. 1;

FIG. 3 is a vertical sectional view through still another implement in the form of a bristle brush;

FIG. 4 is a vertical section like FIG. 3, but shows a rubber-like polishing member for use with the device;

FIG. 5 is a view showing a pick form of implement;

FIG. 6 is a partial section through a device according to the present invention having a pressurized container connected thereto;

FIG. 7 is a fragmentary view showing a more or less conventional brush element adapted for mounting on a pressurized container of the type shown in FIG. 6;

FIG. 8 is a longitudinal section through a modification of the invention, including an arrangement for rotating the implement;

FIG. 9 is a sectional view indicated by line IX—IX on FIG. 8, showing the mechanism for actuating the implement in rotation;

FIG. 10 is a schematic view showing how the device can be connected to a source of treatment liquid by a tube; and

FIG. 11 is a rather schematic perspective view showing, specifically, the manner in which the polishing member of FIG. 4 operates and also being representative of the manner in which the rotary brush of FIG. 3 operates.

BRIEF SUMMARY OF THE INVENTION

The present invention comprises a tooth engaging and treating element mounted on a hand graspable handle arrangement, and which handle arrangement either includes a resilient bulb connected, via passage means, with passage means in the tooth engaging element, or a pressurized container that is connected to the handle with the discharge therefrom controlled by a valve. The tooth engaging element can take any of several different forms and is arranged to be driven in rotation according to one modification of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings somewhat more in detail, in FIG. 1, numeral 10 indicates a resilient container, preferably of transparent or translucent material so that the contents thereof can be observed. Instructions for operation of the device can be printed on the container.

The container is collapsible by squeezing with the hand and one side of the container is preferably substantially stiffer than the other side thereof so that the container, while being resilient and collapsible, still forms a firm support for the device. In one end of the container is a check valve assembly opening into the container and indicated by reference numeral 12. The check valve includes the spring biased valve member 14 and is adapted for being closed by running screw 16 inwardly. Running screw 16 out to the position in which it is illustrated will, of course, permit check valve 12 to function to admit air, or fluid, into the right end of container 10, while preventing any movement of air or fluid out of container 10 at the right end. When screw 16 is screwed down the check valve is held closed and the right end of container 10 is sealed against leakage.

At the left end of container 10 is a spring biased check valve 18 which permits air or fluid to flow from the container 10 into chamber 20, but prevents flow in the opposite direction. Container 10 communicates via passage 22 in member 24 with a further passage 26 in a flexible or jointed support member 28. Member 24 is threaded at 30 to a member 32 that is mounted on the left end of container 10 permanently assembled therewith. Similarly, member 28 has a threaded connection at 34 with the other end of member 24.

At its outer end flexible or jointed support member 28 terminates in a head 36 which is generally tubular in nature and threadedly receives the shank 38 of a tooth engaging and treating implement 40. Aforementioned passage 26 communicates at its left end with the interior of tubular head 36 and from there with passage 42 leading downwardly into implement 40 and terminating in an angularly directed outlet ports or nozzles 44.

The communication of passage 26 with passage 42 is under the control of knurled screw 46 which, when screwed down into its lower position, closes off the upper end of passage 42. Rotatably mounted on the elongated reduced diameter part of member 24 is a spool 48 adapted for carrying dental floss 50. The end of the dental floss is fed out slot 52 in a cylindrical covering sleeve 54 and which sleeve may also have a tab 56 under which the dental floss can be locked and which can be employed for breaking off the dental floss. Sleeve 54 had one end threaded to the outside of member 24 and 58 and extends axially over spool 48 and, at its other end, abuts member 32.

In operation, the resilient rubber-like implement 40 can be used to massage the teeth and gums and the pointed end thereof can enter the spaces between the teeth and dislodge particles therefrom, while fluid can be supplied to the region being treated by the implement by manipulation of container 10. The treatment fluid can be a cleaning agent if so desired and may, furthermore, contain a treatment agent such as a fluoride, if so desired.

FIG. 2 shows an implement 60 of about the same shape as implement 40 in FIG. 1, but having the radial and axial ribs 62

distributed circumferentially thereof. The implement of FIG. 2 is adapted for polishing the teeth, as well as penetrating spaces between the teeth to dislodge particles therefrom. As in connection with the implement 40 of FIG. 1, discharge ports 64 are provided in the implement of FIG. 2.

FIG. 3 shows an implement comprising a body 66 having mounted therein the multiple rows of bristles at 68, which may be held inside flange 70 of the body of the implement by the pressed in metal rings 72. The axial passage 74 in the implement has at least one cross drill 76 in communication therewith and opening to the inside of the bristle arrangement.

In FIG. 4, the implement shown comprises the shank portion 78 having a fluid supply passage 80 extending therealong while connected to the shank portion is the double-skirted rubber-like member 82, which is provided with axial incisions 84 and small notches 86 on the end. The implement of FIG. 4, as well as that of FIG. 3, can spread out substantially flat against the two surfaces and engage the teeth under the edges of the gums and thereby carry out highly efficient cleaning and polishing operations.

FIG. 5 shows a tubular element 88, which can serve as a pick because the pointed small end can be inserted in the space between the teeth and then fluid under relatively high pressure jetted from the pointed outer end of the pick in order to dislodge food particles and the like from between the teeth.

FIG. 6 shows a pressurized container 90 which may contain a liquid and a pressurizing gas, such as freon, or the like. Container 90 has a threaded neck 92, normally closed by a check valve ball 94. The neck is adapted for threadedly receiving a block 96 which is threaded at 98 for receiving the threaded end of a member 100, the opposite end of which is enlarged at 102 and threaded internally at 104 and externally at 106. Member 100 has an axial passage 108 extending therethrough and terminating in lateral ports 110 inside the rubber-like seal sleeve 112, which is mounted in block 96. The extreme end of member 100 is in the form of a pointed cone shape portion 114 so that when member 100 is screwed in place in block 96 it will push ball 94 off its seat.

Member 100 may, as in the connection of the modification of FIG. 1, rotatably carry a spool 116 on which dental floss is mounted and the device may comprise an outer sleeve 118 threadedly mounted on threads 106 and extending axially along the spool and abutting block 96. This sleeve is slotted to permit the floss to be drawn off the spool 116.

A connector member 120, preferably either flexible or jointed, has a threaded end engaging threads 104, while the other end has a cylindrical head 122 having a valve member 124 threaded therein and adapted at the end opposite valve member 124 detachably to support an implement 126.

FIG. 7 shows an arrangement similarly to that of FIG. 6, except that the brush element 130 in FIG. 7 is substantially conventional except for the passage means 132 that communicate with spaces between bristles 134 at one end while, at the other end, passage 132 is under the control of a valve member 136. The passage, beyond valve member 136, leads to a pressurized container such as is shown at 90 in FIG. 6.

In the modification of FIGS. 8 and 9, the manually collapsible bulb 150 is connected by connecting arrangement 152, which is substantially the same as those previously described, with a tubular support member 154 having a box-like head 156 mounted on the free outer end thereof.

In head 156 are the meshing bevel gears 158, one of which is mounted on a shaft 160 rotatable in tubular member 154 and extending completely into the interior of bulb 150. The other of the bevel gears 158 is mounted on a shaft 162 which can carry an implement. If a passage is provided from bulb 150 into head 156 and shaft 162 is hollow, a valve member 164 can be provided in the head for selectively opening and closing the passage in shaft 162.

Inside bulb 150, shaft 160 carries a cylindrical element 166 and engaging opposite sides thereof are the two drive mem-

bers 168. These drive members extend diametrically of the bulb 150 and terminate in actuating pads 170, which can be availed of for moving actuating elements 168 toward and away from each other, thereby reversibly to rotate cylindrical element 166 and, therefore, shaft 160, bevel gears 168, shaft 162 and an implement mounted thereon. The actuating elements 168 may engage cylindrical element 166 merely by friction, or they may be in the form of racks and the element 166 toothed for positive rotation thereof by reciprocation of the said racks.

The present invention contemplates connecting a manually operable bulb of the device with a source of treatment liquid as is shown schematically in FIG. 10. In FIG. 10, numeral 180 represents a container of treatment liquid, such as a fluoride containing liquid and this container is connected by a flexible tube 182 and an inlet check valve 184 with a manually operable bulb 186 which is adapted to discharge through an exit check valve 188 to the implement 190. In this arrangement, the bulb operates as a pump to transfer treatment liquid 180 to the implement and to cause the liquid to emerge from the implement under pressure.

It is possible for container 180 in FIG. 10 to be provided with a motor driven pump, if desired, to supply the treatment liquid therefrom to the tooth engaging implement and, in which case, the hand squeezable bulb is not needed. Rather, the hand graspable portion of the device would include a valve controlling the flow of the treatment liquid to the tooth engaging implement.

FIG. 11 illustrates the polishing member of FIG. 4 in operation. In this figure the polishing member is presented endwise to a tooth 200 and will spread out so that the blades 202 of the polishing member will bear against the tooth surface. When the polishing member rotates, the tips of the blades can run under the edge of the gum 204 and effect polishing operations in that difficult to reach region.

FIG. 11 is also indicative of the manner in which the brush of FIG. 3 will operate to get beneath the edges of the gums and carry out cleaning and polishing operations.

Modifications may be made within the scope of appended claims.

What is claimed is:

1. A dental or oral hygiene device comprising:
 - a. a tubular shaped head member adapted to carry a tooth treating element having a central passage terminating on the surface of said element,
 - b. said head member having a first manually operated valve means for controlling the flow of liquid through the central passage,
 - c. a hand graspable support having a central passage therethrough,
 - d. an elongated hollow flexible member connecting the head member to said hand graspable support and providing communication between the central passage of said hand graspable member and said tubular head member, said flexible member adapted for angular adjustment of said tooth treating element,
 - e. a hollow resilient bulb having one side substantially stiffer than the other side connected to said hand graspable support,
 - f. said resilient bulb provided with a one way check valve means at one end to permit liquid to flow into the central passage of said hand graspable support from said resilient bulb while preventing flow in the opposite direction,
 - g. a second manually operated valve means disposed at the other end of said bulb to admit air to said bulb while preventing movement of air out of said bulb, and
 - h. means for locking said second valve means in a closed position.
2. A hygiene device according to claim 1 in which the hand graspable support includes a hollow tubular portion having an opening adjacent one end.

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