

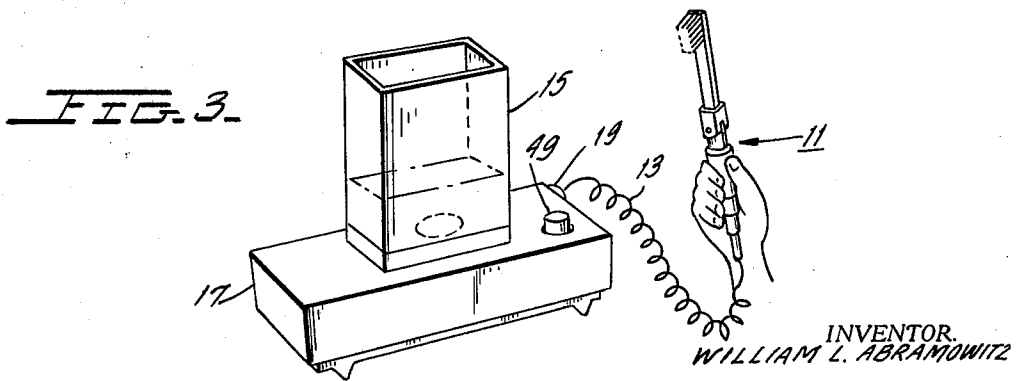
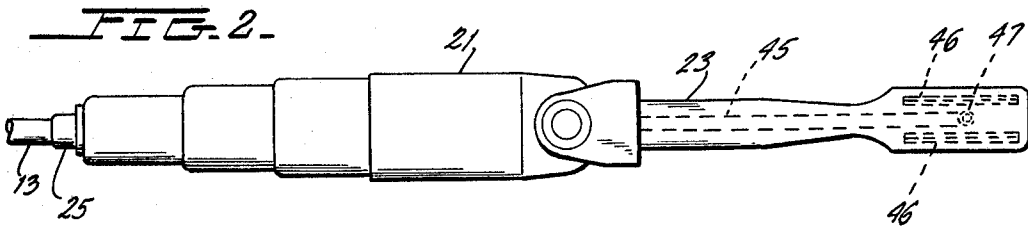
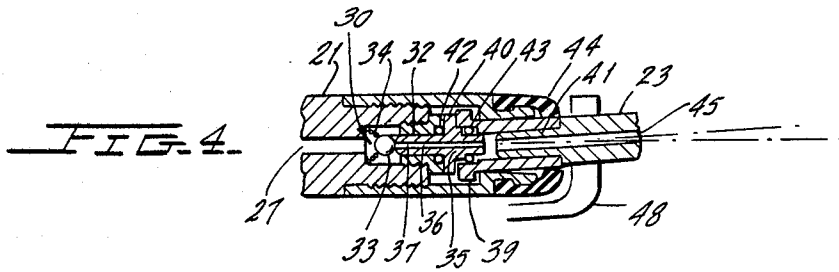
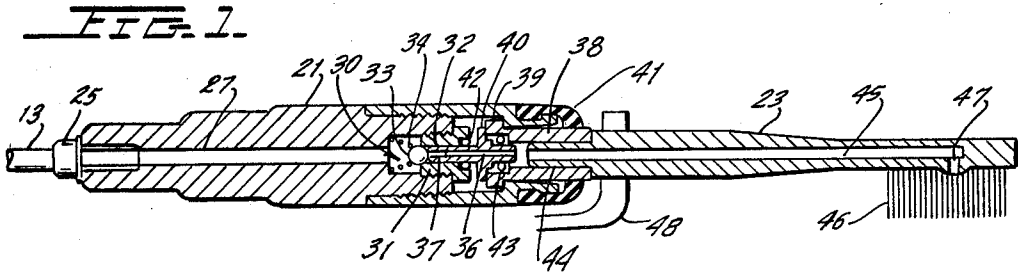
Nov. 4, 1969

W. L. ABRAMOWITZ

3,476,105

SPRAY GUM MASSAGER

Filed Feb. 23, 1967



INVENTOR.
WILLIAM L. ABRAMOWITZ

BY
OSTROLENY, FABER, GERB & SOFFEN
ATTORNEYS

1

2

3,476,105

SPRAY GUM MASSAGER

William L. Abramowitz, 93 Atlantic Ave.,
Swampscott, Mass. 01907

Filed Feb. 23, 1967, Ser. No. 617,933

Int. Cl. A61h 9/00, 13/00; A46b 11/04

U.S. Cl. 128-65

3 Claims

ABSTRACT OF THE DISCLOSURE

A device for cleaning and massaging teeth and gums having a treating element for directing a controlled flow of pressurized fluid upon the teeth and gums. A refillable container for water or a medicated cleansing fluid is connected to a pump which imparts pressure to the fluid. The pressurized flow of fluid is then directed to a hand-held, toothbrush-like instrument, through the head of which the fluid flows to impinge upon the teeth and/or gums. The fluid flow out of the opening is controlled by an omni-directional valve which opens responsive to pressure of the toothbrush-like instrument against the teeth or gums.

This invention relates to a tooth-cleaning and gum-massaging device and, more particularly, to a toothbrush-like instrument which provides a continuous, or semi-continuous, flow of a cleansing fluid under pressure, to further assist in cleaning and massaging of the teeth and gums.

A major problem in oral hygiene is the protection of the teeth and surrounding gum tissues from harmful agents which may deposit thereon as a result of eating and smoking.

The major limitation of the ordinary toothbrush used in the home is its inability to reach crevices and pockets in and between the teeth. Thus, a dentist often uses a tool which directs a pressurized jet of fluid against the teeth and gums, to clean deposits from inaccessible portions of the teeth.

The primary difficulty in adapting such a device to home use is the inability of the layman to accurately aim the jet at the spot to be cleaned. Also, even if the jet could be effectively aimed, another operation of brushing might be necessary to scrape surface deposits of tartar and other contaminants from the teeth. Various devices have, however, previously been described to facilitate direct cleaning and massage of the teeth and gums in the home. Thus, Mattingly U.S. Patent No. 3,227,158 discloses a complex device for directing a pulsating liquid jet against the teeth or gums. The device provides a pulsating flow of liquid which is controlled by a manual valve independent of the treating member. There are no massaging or brushing elements combined with the treating member.

Shpuntoff U.S. Patent No. 3,261,354 discloses a similar tooth-cleaning tool which, however, provides a continuous flow of a pressurized fluid. However, as with the Mattingly device, the liquid flow is controlled by a manual valve which is independent of the treating member.

Accordingly, the primary object of the present invention is to provide a device for treating gums and teeth which combines a brushing or massaging member with means for providing a continuous, or semi-continuous, flow of a cleansing fluid, which flow can be easily controlled by the user.

Another object is to provide a device for cleaning teeth and massaging gums which can be easily controlled by the inexperienced layman, while he is in the process of massaging and brushing his teeth and gums.

Still another object is to provide such a device which can be used as a source of a high pressure water or similar

cleansing flow, and which includes means for preventing excess water from filling the mouth of the user.

These, and other features of the invention, will become more apparent from the following specification and drawings wherein:

FIGURE 1 is a cross-section of the treating member of the tooth-cleaning device, which is held in the hand of the user.

FIGURE 2 is a plan view of the hand-held treating member of the device.

FIGURE 3 is a perspective view illustrating the hand-held member connected to a source for the cleansing fluid dispersed therewith.

FIGURE 4 is a detail of the omni-directional valve in the hand-held treating member, when the valve is in the "open" position.

This device for cleaning and massaging teeth or gums has means for supplying cleansing fluid under pressure to the teeth or gums in combination with a treating and brushing member. The flow of fluid is controlled by a valve means which opens responsive to a pressure of the treating member against the teeth or gums. In this manner, the user can easily control the flow of liquid.

Referring initially to FIGURE 3, a simplified version of a preferred embodiment of the complete device with its housing is shown.

The hand-held treating member 11 is connected by means of a flexible tube 13 to a supply of medicated cleansing fluid.

A refillable container 15 which will hold the water or medicated cleansing fluid used to massage the teeth and gums is mounted on housing 17, which encloses a pump and motor, not shown. A universal motor with an adjustable speed means such as a rheostat may suitably be employed, coupled to either a vane or gear pump which will impart fluid pressure to the medicated cleansing fluid in container 15.

A means, not shown in the drawing, is provided between the container and the housing to provide direct communication between the pump and the fluid in the container.

Aperture 19 at the side of the housing 17 is connected to a flexible tube 13 which will carry the medicated cleansing fluid to the treating member 11. Treating member 11 is comprised of handle member 21 and a hollow operating or massaging element 23.

Handle member 21 is constructed to be easily gripped by the user. A plastic collar 25 provides a secure connection between the flexible tube 13 and the handle member 21. Handle member 21 is formed with a conduit 27 therein to receive the pressurized flow of fluid from flexible tube 13.

An omni-directional valve 30 comprised of several elements is located within the handle member 21 to control the flow of fluid moving through conduit 27.

The valve mechanism includes a mounting element 31 threadably engaged within the handle member housing 21. The mounting element is a hollow member having a bore 32 extending therethrough, one end of the bore being designed to communicate with the supply conduit 27 when the valve member is opened in the manner described hereinafter. A ball element 33 is biased against the mounting element as by a compression spring 34 received within a suitable annular recess provided in the housing. The ball is thus biased into the position illustrated in FIGURE 1, seated against the end of the bore 32 and sealing such bore from the supply conduit.

A tubular element 35 is slidably mounted within the bore 32 to effect opening and closing of the valve mechanism. The tubular element defines an internal passageway 36 terminating at one end adjacent the end of the bore and the ball 33 seated thereon. At least one, and

preferably two, slots 37 are provided in the wall of the tubular element adjacent such end in order that, as described hereinafter, movement of the tubular element relative to the ball member will facilitate fluid flow from the supply conduit, and through the tubular element outwardly of the device.

A hollow sleeve 38 is additionally disposed within the housing 21 annularly of and adjacent the opposite end of the tubular element, an outward flange 39 provided on such sleeve bearing against a corresponding flange element 40 provided on the tubular element. The sleeve element 38 extends outwardly of the handle member, being maintained in place within the housing by means of a flexible boot 41. The boot member permits a certain degree of displacement of the hollow sleeve from its normal position illustrated in FIGURE 1, when the device is not in use, to its valve actuating position illustrated in FIGURE 4, when the device is in use.

In order to provide a leak-proof assembly, the tubular element 35 is mounted concentrically of and within the mounting element 31 and the hollow sleeve element 38 by means of O-rings 42 and 43, respectively. Upon opening of the valve means fluid flow is thus provided solely from the supply conduit 27 into and through the passageway 37 in the tubular element, rather than annularly of such element.

The hollow massaging element 23 incorporates an extension 44 adapted to be received within and engaged by the hollow sleeve 38. The internal passageway 45 provided within the massaging element is thus disposed adjacent the tubular element 35 in communication with the passageway 36 provided therein.

A plurality of bristles 46, such as provided on the usual toothbrush, may be secured at the outer end of the massaging element 23. The internal passageway 45 terminates in one or more openings 47 aligned with and disposed adjacent the bristles 46. While one such opening is illustrated in the drawing, it will be understood that a number of the same may be provided lengthwise of and aligned with the bristles 46.

Operation of the apparatus is initiated by switching on dial 49, thus starting the motor which, in turn operates the pump. The pump means feeds the fluid from the container 15 through the outlet 19 into the flexible tube 13, and then into the handle member 21.

The jet of fluid moves through conduit 27 until it arrives at omni-directional valve 30. When the omni-directional valve is closed, as shown in FIGURE 1, the flow of fluid ceases at this point. The valve is closed when the longitudinal axis of massaging element 23 is coincident with the longitudinal axis of conduit 27.

When the device of the invention is in use, pressure is applied by the user's teeth or gums against the bristles 46 of the massaging element thereof. Such pressure effects a slight deflection of the massaging element relative to the hand member 21 and its internal mechanism, to effect opening of the valve and actuation of fluid flow. Specifically, as shown in FIGURE 4, a slight deflection of the massaging element urges the centerline of sleeve 41 to the left, thus causing flange 39 to bear against flange 40. Tubular element 35 moves to the left, thus dislodging ball element 33 from the entrance to the bore 32 of the mounting element 31 and exposing the slots 37 of tubular element 35. The fluid then enters through the slots into the passageway 36 of tubular member 35. Thus, when the valve is open as shown in FIGURE 4, responsive to pressure of the massaging element against the teeth or gums, fluid flows from tube 13 through conduit 27, valve 30, and conduit 45, for dispensing through the opening 47.

It becomes clear that a most important feature of the present invention is that pressure of the brush or massaging element against the teeth or gums causes liquid to flow out of the small opening 47. As noted, only a slight pressure of the massaging element 23 upon the teeth or gums is necessary to open the valve 30. As soon as such

pressure ceases, due to a relaxation by the user or a removal from the mouth, the flow of fluid also stops.

It is to be noted that the pump means produces only a steady flow, no pulsating action being produced.

Alternatively, a thumb control 48 is provided to allow the operator to manually open the valve 30 without pressing the massaging element 23 against the teeth or gums. Thus, the user can have the additional choice of using the fluid jet without brushing the teeth or gums. The user can control the spot at which fluid will jet forth from opening 47 by positioning the massaging element at the desired spot and, by moving the brush around selected areas of the mouth, can achieve a thorough cleansing operation. This flexibility will also prevent too long an exposure of the jet on any single spot, thus preventing irritation of sensitive gum areas.

Also, the instant invention prevents the flooding of the mouth with medicated fluid or water. Each time the brush is removed from the mouth, the applied pressure is terminated, the flow stops, and the mouth can be emptied. This prevents undesirable flooding of the mouth. In prior art devices, the flow of fluid is controlled only by stopping and starting the motor, which operates the pump providing the pressurized fluid.

Additionally, the presence of the omni-directional valve provides the advantage that the device may be used by the right or left hand, as the valve works to release fluid regardless of the direction of force.

The massaging element 23 is easily detachable from sleeve 38 so that different massaging elements may readily be attached to the handle member, thus facilitating use of the device by any number of users. The massaging element 23 is shown in the preferred embodiment with a plurality of bristles for brushing the teeth. Alternatively, a plurality of rubber massaging tips may be attached to the massaging element to provide additional or alternative massaging means for the teeth and gums. The treating member is shown with a single opening, but a model using multiple jets for more effective cleaning could be easily adapted.

The pump is capable of imparting fluid pressure to the liquid in the container 15, and the pressure may be variably selected from about 10 p.s.i. to 100 p.s.i. by means of control element 49. It has been found that a pressure of 50-90 p.s.i. is most effective for cleaning and massaging purposes, whereas substantially higher pressures may cause damage to sensitive gum tissue.

It is convenient to have a container and self-contained pump means in the instant device, as connection of the treating member to the ordinary home faucet would present difficulties in that there are numerous types of faucets to which connection might have to be made. Secondly, water pressure from a home faucet will vary greatly from home to home and, within one home, may vary from day to day. The self-contained pump means thus is a dependable means for simply providing predictable fluid pressure. An additional advantage of a self-contained pump means is that it makes the device portable.

Suitably, subsequent users of the device may utilize separate supplies of water or medicated cleansing fluid. Such may be desirable since, as a matter of personal hygiene, the user may prefer a fresh supply of liquid for each operation. The amount of water or other liquid which is necessary for individual use varies as a matter of personal choice. An additional advantage of the instant invention is that it requires much less fluid for the same period of operation than prior art devices, it thus being feasible to charge sufficient liquid to the container for at least each individual user.

It has been found that the combination of brushing action and a pressurized fluid jet impinging on the teeth and gums leaves the mouth unusually clean, and with a feeling of freshness.

Although there has been described a preferred embodiment of this novel invention, many variations and modifications will now be apparent to those skilled in the

5

art. Thus, while the operation of the present invention has been described in connection with the cleaning of teeth and gums, it is evident that the tool would be equally useful in the cleaning of dentures. Accordingly, this invention is to be limited not by the specific disclosure herein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. In an instrument for the treatment of teeth and gums comprising means for supplying a pressurized flow of cleansing fluid and a treating member for dispensing such fluid while simultaneously brushing and/or massaging the teeth and gums, the improvement comprising:

a valve means in the treating member for controlling the flow of the cleansing fluid, said valve means opening responsive to pressure of said treating member against the teeth or gums to dispense said fluid, wherein said treating member comprises a hollow elongated housing communicating at one end with the supply means for the cleansing fluid and incorporating

(a) a supply conduit extending lengthwise through the housing, the supply conduit communicating at one end with the supply means for the cleansing fluid;

(b) said valve means communicating with said supply conduit, said valve means including

(1) a mounting element secured within said housing and having a bore extending there-through, one end of said bore being adapted to communicate with the opposite end of said supply conduit,

(2) a ball element biased against said mounting element and normally sealing said one end of said bore from the supply conduit,

(3) a tubular element slidably mounted in said mounting element bore with one end of the tubular element seated within said bore adjacent said one end thereof, and having at least one slot formed longitudi-

6

nally of the tubular element and extending to said one end thereof, and

(4) a sleeve element disposed within said housing annularly of and adjacent the opposite end of said tubular element; and

(c) an elongated hollow operating element, one end of which is adapted to be received within the housing disposed adjacent and in communication with said tubular element, and bearing against said sleeve, and the opposite end of which is adapted to extend outwardly of the housing;

lateral pressure on said operating element effecting displacement of said sleeve and tubular elements and unseating said ball element from said bore to thereby effect communication between the slot formed in said tubular element and said supply conduit to permit fluid to flow from the supply means, through said housing, and into said operating element.

2. The instrument of claim 1, in which said tubular element is outwardly flanged and bears against a mating flange on said sleeve element, lateral deflection of the flanged sleeve element effecting displacement of the flanged tubular element engaged therewith.

3. The instrument of claim 1, wherein said massage element comprises a hollow toothbrush handle adapted to be removably engaged within the sleeve element of said valve means.

References Cited

UNITED STATES PATENTS

1,278,225 9/1918 Schamberg ----- 401—272 XR
 3,256,893 6/1966 McEachran ----- 401—272 XR

FOREIGN PATENTS

519,342 12/1955 Canada.

L. W. TRAPP, Primary Examiner

U.S. Cl. X.R.

401—273