

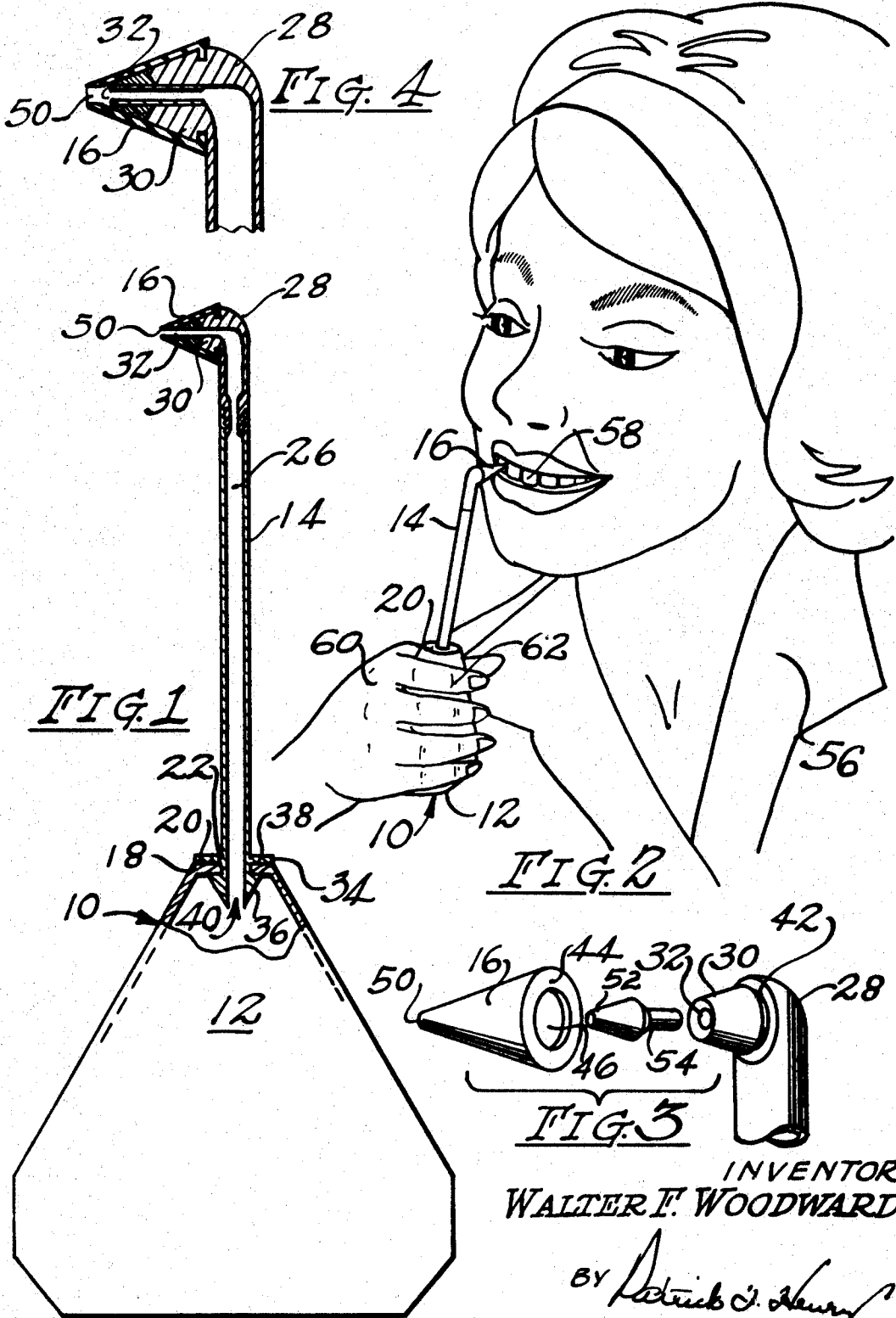
July 9, 1968

W. F. WOODWARD

3,391,696

DENTAL HYGIENE LIQUID PRESSURE DEVICE

Filed Jan. 4, 1966



INVENTOR  
WALTER F. WOODWARD

By *Patrick J. Henry*  
ATTORNEY

1

3,391,696

**DENTAL HYGIENE LIQUID PRESSURE DEVICE**  
 Walter F. Woodward, 1266 W. Paces Ferry Road NW.,  
 Atlanta, Ga. 30327  
 Filed Jan. 4, 1966, Ser. No. 518,565  
 2 Claims. (Cl. 128-232)

**ABSTRACT OF THE DISCLOSURE**

A dental hygiene liquid pressure device which includes the soft tip that may be inserted between the teeth and a hand operated fluid pressure container for supplying a jet stream of water for removing residual debris from the mouth and for stimulating gum tissues. The tip of the device is removable and may be provided with a removable and changeable adapter to change the size of the outlet and thereby vary the stream of liquid.

It is well known that the dental problems from periodontitis result from the formation of bacteria from food debris or the like which is not immediately removed and also from the inflammation to the gums resulting from the collection of substances which remain and harden.

Brushing, even after every meal, usually cleans only the exposed surfaces of the teeth and cannot properly clean between the teeth, under bridge work, around orthodontic or prosthetic appliances and these are the critical areas where gum disease starts. Even power operated toothbrushes do not solve these problems. In addition, things such as dental floss and tape, hard and soft toothpicks, rubber stimulating tips and assorted instruments are available but the inherent problems involved in the use of these generally discourages proper use and sometimes the improper use causes more damage than good. An effective means of properly cleaning between the teeth and under bridge work and the like is a properly directed pressurized stream of liquid such as water. Atomized and vaporized streams and the like are inadequate. The only device known at this time for providing such a properly directed pressurized stream of water is a dental pump arrangement which is more expensive than the average person is willing to pay. The present device is a manual arrangement for providing a jet stream of water under pressure and for providing the pulsating jet stream which is often effective in removing food deposits and the formations of certain types of hardened substances.

Generally described, without restriction on the scope of my invention as defined in the appended claims, the present device comprises a syringe-type bulb container adapted to be made from resilient or flexible plastic or rubber-like material or any combination of materials to provide a collapsible but resilient and springy container which holds a supply of water and may be manipulated manually with some amount of manual force for the purpose of pumping the water therefrom. Preferably the bulb is in a somewhat pyramidal-like shape with an outlet opening near the apex portion of the pyramid for receiving a barrel which in the present embodiment is an elongated tubular member constructed from metal, hard plastic or similar material and having a tapered fitting on one end thereof spaced from a washer-like element formed integrally with said barrel thereby creating an annular groove which is to receive the annular portion of the cut-off apex of the bulb. Thus, the end of the barrel is inserted through the opening in the bulb with the tapered member on the inside and the washer on the outside and the annular portion of the bulb confined in the annular ring. The terminal end of the barrel is curved and terminates at an angle of almost approximately 90 degrees with a tapered terminal portion having an outlet opening therein

2

and having an annular recess formed thereon which receives an annular ring or flange formed on a tapered, elongated rubber or plastic tip which is inserted over the terminal tapered end of the barrel and pressure fitted into place in a fluid tight manner. Fluid, such as water contained in the bulb, by the common and conventional method of collapsing the bulb empty by hand and then allowing it to draw the fluid from a supply, is pumped either in a straight or pulsating action by squeezing on the collapsible container causing the fluid to emit from the small orifice at the end of the barrel and through the resilient, rubber-like tip which may be inserted adjacent to and between the respective teeth to flush material and debris from the gums and between the teeth. An adapter fits inside the tip for changing the size of the pressure flow.

A primary object of the invention is to provide an inexpensive device for manually delivering a continuous or pulsating jet stream from a resilient tip for use in the mouth between the teeth adjacent to the gums.

Another object of the invention resides in the specific construction of the parts for inexpensive and dependable operation.

Still another object of this invention resides in the specific formation of the resilient tip on the device whereby it may readily be removed and replaced and is made fluid tight in a simple and expedient manner.

An additional object of this invention resides in the specific construction of the end of the conduit or barrel for delivering the fluid from the manually operated container and the arrangement for attaching the barrel to the outlet of the container.

Other and further advantages of my invention will become apparent upon reading the following specification taken in conjunction with the accompanying drawings, in which:

FIG. 1 is an elevation view of the present invention with a part thereof broken away.

FIG. 2 is a perspective view showing one way of using the present invention between the teeth.

FIG. 3 is a perspective assembly view with parts thereof broken away and showing the detachable, resilient and flexible tip.

FIG. 4 is an enlarged view of the cross-sectional view of the tip in FIG. 1.

Referring to the various views of the drawings and initially to FIG. 1 and thence as the description unfolds thence on to the other figures of the drawings, the complete and assembled liquid pressure device of the present invention is designated generally and overall by the reference numeral 10 in the drawings and comprises three primary parts, to-wit: a collapsible self-returning, resilient bulb container 12 which may be molded in one piece and to which is connected the outlet tube or barrel 14 constructed from plastic or metal or the like and the very important applicator tip 16 which is flexible, resilient and somewhat elongated for fitting at the juncture between two teeth and at the gum line for applying the liquid delivered under pressure.

Bulb 12 is a collapsible, resilient and flexible bag-like container device which may be molded in one piece from rubber, plastic or the like and having a cylindrical apex or juncture 18 which may be reinforced by means of a metal or plastic washer-like member 20 which is seated in and around an outlet opening 22. According to well known molding or other manufacturer's procedures, the reinforcing washer 20 may be molded into the material surrounding the outlet apex portion 18 and thereby embedded and retained therein.

The barrel or tube 14 is an elongated, cylindrical tube member with a central opening 26 and upper, curved portion 28 which is curved approximately 90° with respect to the longitudinal center line through the tube 14 and

which curved portion 28 tapers into a cone shaped portion 30 as readily seen in the perspective view in FIG. 3 and which has the outlet 32 at the tip thereof. The other end of the barrel 14 from the curved portion 28 has a retaining means thereon comprising a first, flat washer member 34 molded to or otherwise rigidly attached to the outside surface of barrel 14 and being spaced from a conical shaped tip 36 by means of a circular notch or recessed portion 38 which receives the circular portion around the reinforced washer 20 of the bulb 12. This may be done through a pressure action of forcing tip 36 to expand the area of the material around and containing washer 20 and allowing the washer 20 and portion around the outlet 22 to expand and snap into position in the notch 38 thereby tightly securing the barrel 14 on the bulb 12 and providing a fluid tight joint or connection through which the fluid in the bulb 12 is pumped by manual action through the inlet 40 in the bottom of barrel 14 inside of bulb 12.

The conical shaped tip 30 on the end of barrel 14 is spaced from the curved portion 28 by means of a circular notch or recess 42 to receive the circular flanged end 44 of the applicator tip 16. Applicator tip 16 is removable and replaceable and is preferably molded from a shaped piece of rubber or plastic or other rubber-like material into a conical shape larger than but corresponding in taper and shape and form substantially to the outside surface of the tip 30 of portion 28. The opening 46 which is circular and is defined inside of the flanged portion 44 is smaller than the upper circular portion of the conical shaped tip 30 and is also in normal retracted condition smaller than the diameter of the outer portion which has the circular notch 42 therearound so that the flange 44 fits tightly around the circular periphery of the notched portion 42 between the curve portion 28 and the conical tip 30. This arrangement requires the applicator tip 16 to be forced over the upper part of the conical tip 30 to allow the resilient flanged portion 44 to snap in position in the notch 42 thereby providing a fluid tight joint and at the same time making it possible readily to remove and replace the resilient, flexible tip 16. The outlet tip 50 of the resilient tip 16 has an opening therein and is spaced from the more rigid outlet tip portion 30 so as not to injure the tissue of the gums or to cause any discomfort. The small cross-sectional area of the tip 50 makes it possible to position the tip 16 inside the junction between two adjacent teeth, which may be bridgework or crowns or caps or the like, and to direct the jet stream of liquid directly between the teeth and at the juncture of the gums which is the place where bacteria are more likely to collect and where periodontal pockets form. A cone-shaped adapter 52 having a tube 54 rigidly attached thereto and extending therefrom fits inside the applicator tip 16 with the tube 54 extending inside tip 30 thereby selectively changing the opening 32 and outlet 50 to adjust for larger or smaller interproximal spaces between the teeth 58 depending upon the age of the user, condition of the user's teeth and gums and other factors which would indicate a larger or smaller stream.

In the diagrammatic figure drawing of FIG. 2, a model 56 with teeth 58 has the applicator tip 16 positioned between the upper adjacent junction of two teeth and at the gum line and is holding the bulb 12 in the hand 60 with the fingers 62 encircling the bulb 12 to exert considerable manual squeezing pressure thereon. Bulb 12 is charged in the usual manner by collapsing it first and then submerging the outlet tip 16 in a liquid such as water and allowing the pressure to fill the bulb completely full. With the bulb 12 filled, pressure from the hand 60 and

fingers 62 causes a very strong jet stream to emit from the outlet 50 through opening 26 in barrel 14 and the applicator tip 16 which is pushed right into the gum line and spaced between two adjacent teeth confines the jet stream so that it spurts with significant pressure between the teeth and into the areas between the teeth and the gum line. This pressurized jet stream is very important because it is the fluid which provides the necessary action to remove fine particles of debris and to flush away bacteria which otherwise would not be affected either by brushing or by atomized or less pressurized water baths as for instance would occur when flushing the mouth simply by filling it with a mouth full of water and rinsing it with the action of the tongue and the teeth.

While I have shown and described a particular embodiment of my invention together with a suggested specific manner of construction and including suggested types of material, this is by way of illustration only and there are many other forms that the invention might take in various substitutions, changes, deviations, eliminations, ramifications, revisions, additions and modifications may be made in the embodiment shown and described and other procedures and modes of operations may be obtained from the invention without departing from the scope thereof as defined in the appended claims.

I claim:

1. In a dental hygiene liquid pressure device to be held in the hand and manually operated thereby and for applying a pressurized stream of liquid such as water to the teeth and gum areas:

(a) a manually operated, resilient, flexible, self-returning bulb container having an outlet thereon,

(b) an elongated applicator barrel mounted on said bulb and being in fluid communication with the interior of said bulb and connected and attached thereto with a fluid tight seal thereon,

(c) a curved outlet portion on said barrel which bends at an angle of more than 75° with respect to the longitudinal center line of the barrel,

(d) a tapered tip on said outlet portion of said barrel,

(e) and a removable applicator tip mounted on and covering said tip of said barrel and having a fluid pressure outlet therein, said applicator tip tapering to a small outlet portion which is small enough to be located in the juncture between the adjacent teeth at the gum line, and said applicator tip being constructed from a resilient, flexible, rubber-like material which is noninjurious to teeth and gums,

(f) said barrel tip being provided with a removable adapter to change the size of the outlet.

2. The device in claim 1, wherein said adapter is conical shaped on one end and has a tubular portion extending therefrom which fits into said barrel.

#### References Cited

##### UNITED STATES PATENTS

322,598	7/1885	Hart	128—231
1,488,777	4/1924	Clements	128—232
1,573,224	2/1926	Condit	128—230
1,762,237	6/1930	Moore	128—231
2,674,247	4/1954	McLellan	128—232
2,739,592	3/1956	Wiles et al.	128—232
3,199,510	8/1965	Sinai	128—232 XR

##### FOREIGN PATENTS

125,945 12/1931 Austria.

RICHARD A. GAUDET, *Primary Examiner.*

R. L. FRINKS, *Assistant Examiner.*