

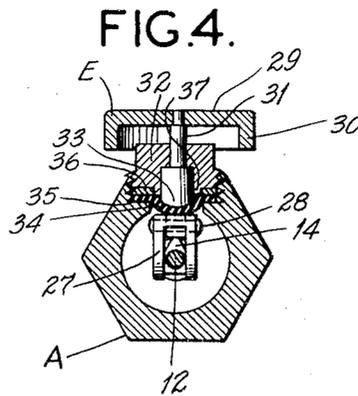
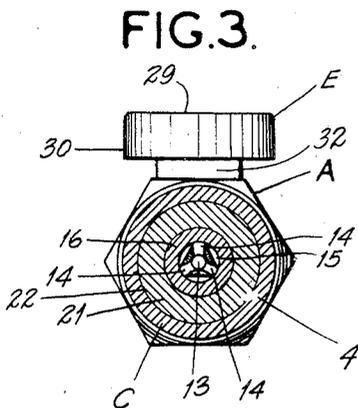
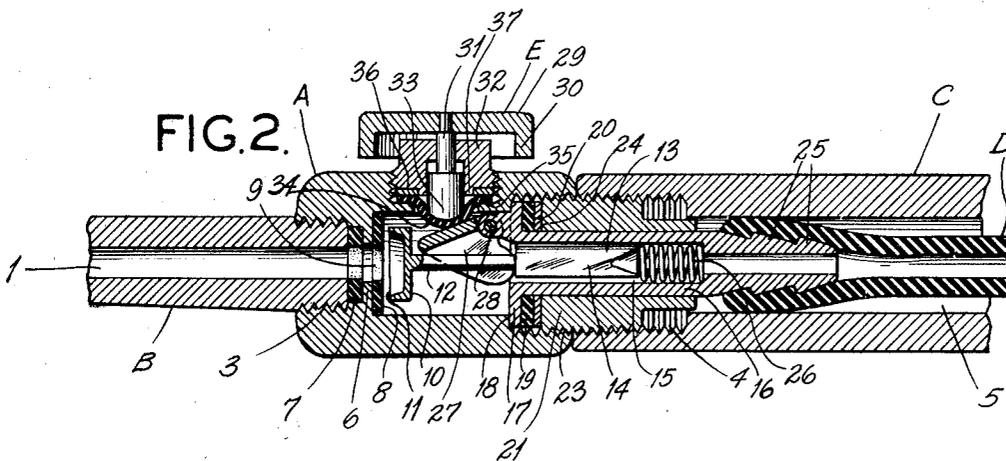
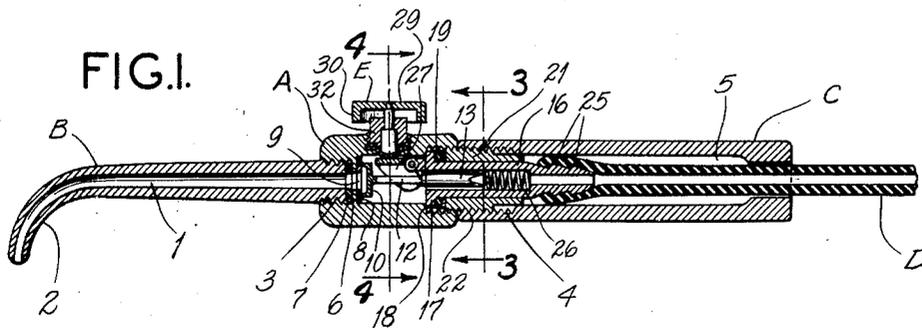
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DENTAL SPRAY

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# UNITED STATES PATENT OFFICE

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## DENTAL SPRAY

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1 Claim. (Cl. 128—224)

My invention relates to a new and useful improvement in dental sprays, and has for its principal object to produce a simple, efficient, and relatively inexpensive device of this character, in which the passage of a column of water or other liquid therethrough is subject to the control of the user of the structure. Another object is to provide a very simple valve-operating mechanism requiring only one spring in the operation thereof, and utilizing the liquid pressure to assist in restoring the valve to its normally closed position.

It is very important in the use of a dental spray of the type herein involved that the passage of water therethrough should be unimpeded except by the positive action of the valve mechanism, and so the blocking or clogging of the conduit should be guarded against in the structure itself, as is shown in the present structure. The valve structure and associated parts are substantial and subject to positive control both in opening and closing, as well as the clearly defined course of travel of the water column through the device. Sediment or small objects contained in the water stream will not prevent the normal operation of my dental spray.

Fig. 1 is a sectional view taken longitudinally through my dental spray with the valve closed.

Fig. 2 is an enlarged, sectional view taken longitudinally through my dental spray with the valve open.

Fig. 3 is an enlarged, cross-sectional view taken on the line 3—3, Fig. 1, looking in the direction of the arrows.

Fig. 4 is an enlarged, cross-sectional view taken on the line 4—4, Fig. 1, looking in the direction of the arrows.

In the drawing, A designates the body of my new device, B the discharge nozzle thereof, C the handle of the structure, and D the tubular member, preferably of rubber, leading to a water faucet or any appropriate water or other liquid connection (not shown). The nozzle B is longitudinally apertured as at 1 throughout its length, and is preferably bent as at 2 near its discharge end, so as to be more conveniently applied to the teeth of the user of the device. At the inner end of the nozzle B screw-threads 3 are provided to permit attachment of the said nozzle to the body A of my structure. The handle C is preferably tubular, and is screw-threaded as at 4, adapting it to be mounted upon a member hereinafter to be described. The handle C is longitudinally apertured as at 5 to receive parts of the mechanism relating to the valve structure and the tubu-

lar member D. The principal purpose of the handle C is for convenience in manipulating my dental spray.

The body A of my new dental spray is preferably hexagonal as shown in Figs. 3 and 4. Such body is hollowed out to receive the valve mechanism now to be described. The forward end of the body A is interiorly screw-threaded to receive the screw-threaded end of the nozzle B. A shelf 6 is provided near the forward end of the body A against which a rubber gasket 7 is adapted to rest when the nozzle B is screwed into position. The purpose of the gasket 7 is to prevent leakage of water at the joint between the body A and the nozzle B. The shelf 6 also serves on its inner side as a support for a soft rubber valve seat member 8, which is centrally apertured as at 9 to permit the passage of water therethrough. If desired, this valve seat member 8 may be cemented against the shelf 6 in order to definitely hold said member in fixed position. Adapted to contact the valve seat member 8 is a cup-shaped, circular valve 10, which is provided, preferably, with the sharp-edged exterior contacting edge 11, which edge contacts the valve seat member 8 and controls the flow of water through my dental spray. A stem 12 extends from the rear center of the valve 10 and merges with the portion 13 which has three vanes 14. The portion 13 is adapted to enter a perforation 15 in a tubular section 16, which will now be described.

The section 16 has a collar 17 at the inner end thereof which seats against a shoulder 18 in the body A. A rubber gasket 19 surrounds the member 16 and fits against one side of the collar 17. A metal washer 20 is placed against the gasket 19, which arrangement prevents leakage at this joint.

A tubular member 21 is screw-threaded on the major outer portion thereof, as shown at 22, which engages screw-threads 23 on the interior of the body A. Said member 21 is provided with a flat end surface 24, which abuts against the metal washer 20 and holds the tubular section 16 in position in the body A. Also, mounted on the tubular member 21 is the handle C whose screw-threads 4 engage the screw-threads 22 on said tubular member 21. The outer end of the tubular section 16 is serrated as at 25, and over this end is slipped the tubular rubber member D through which passes the water from a faucet (not shown).

Abutting against the outer end of the portion 13 is a spiral spring 26 which is located in the

perforation 15 in the tubular section 16. This spring 26 normally tends to force the valve 10 in contact with the soft rubber valve seat 8.

A valve-operating member 27 is pivotally mounted at 28 within the body A. This member is bifurcated, as clearly appears in Fig. 4, in order to straddle the stem 12 carried by the valve 10. The open end of the member 27 contacts the end of the vanes 14 (which act as an abutment) on the portion 13, and when the member 27 is operated longitudinal movement is exerted on the stem 12. The upper part of the member 27 is smooth. An operating plug E is secured in one side of the body A, and consists of the following elements: a disk 29 having a marginal, downturned edge 30 secured to a pin 31, which pin projects through a perforation in a plug 32 which has threaded engagement with an aperture in the body A. The pin 31 has an enlarged part 33, which is preferably rounded at its outer end. A rubber dam 34 is placed in the perforation in the body A and rests on a shoulder 35 at the lower, or inner, end of said perforation. A metal washer 36 is placed on a circular portion 37 of the plug 32 and has its outer face in contact with the inner face of the dam 34. The outer side of this dam 34 is impinged by the rounded end of the pin 31, while the inner side of said dam 34 rests against the upper, smooth side of the valve 27. When the pin 31 is moved downwardly by pressure on the disk 29, the member 27 presses against the end of the vanes 14 on the portion 13 of the stem 12, thereby causing said portion 13 to move outwardly against the action of the spiral spring 26. Such movement, imparted to the stem 12, tends to unseat the valve 10 from the rubber valve seat 8, thus permitting water to flow through my dental spray. When pressure upon the disk 29 is released, the parts referred to are restored by the spring 26 to their

normal, closed position, thus shutting off the flow of water through the device. The action of the spring 26 in restoring the parts to closed position is assisted by the pressure of the water against the inner face of the valve 10.

By regulating the pressure on the disk 29 the volume of water passing through my dental spray can be controlled. The usual water pressure in the water system causes a stream to pass through the nozzle B with sufficient force to dislodge particles of food or other matter between the teeth, and thus cause the teeth to be cleansed of such particles. By making the nozzle B as a separate structure, the body A and handle C and their associated parts may be utilized by a number of different people merely by changing the nozzle.

I claim:

A dental spray adapted for individual home use and comprising a body member, a fluid discharge nozzle and a quick acting and highly sensitive valve construction including a valve seat, a valve slidably mounted in the body member, tension means acting to normally close and retain the valve in seating relation with the valve seat, a stem on the valve and provided with a reduced portion and an abutment, a bifurcated valve operating member pivotally mounted in the body member straddling the reduced portion of the stem and adapted, when depressed, to engage the abutment and move the valve to an open position against the pressure of said tension means, a thumb-actuated plunger adapted to be depressed by a slight thumb pressure of the user for operating the valve, and a self-lubricating, non-metallic dam positioned between the plunger and valve-operating member, providing a seal and transmitting the pressure applied to the plunger to the valve-operating member for opening the valve.

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