

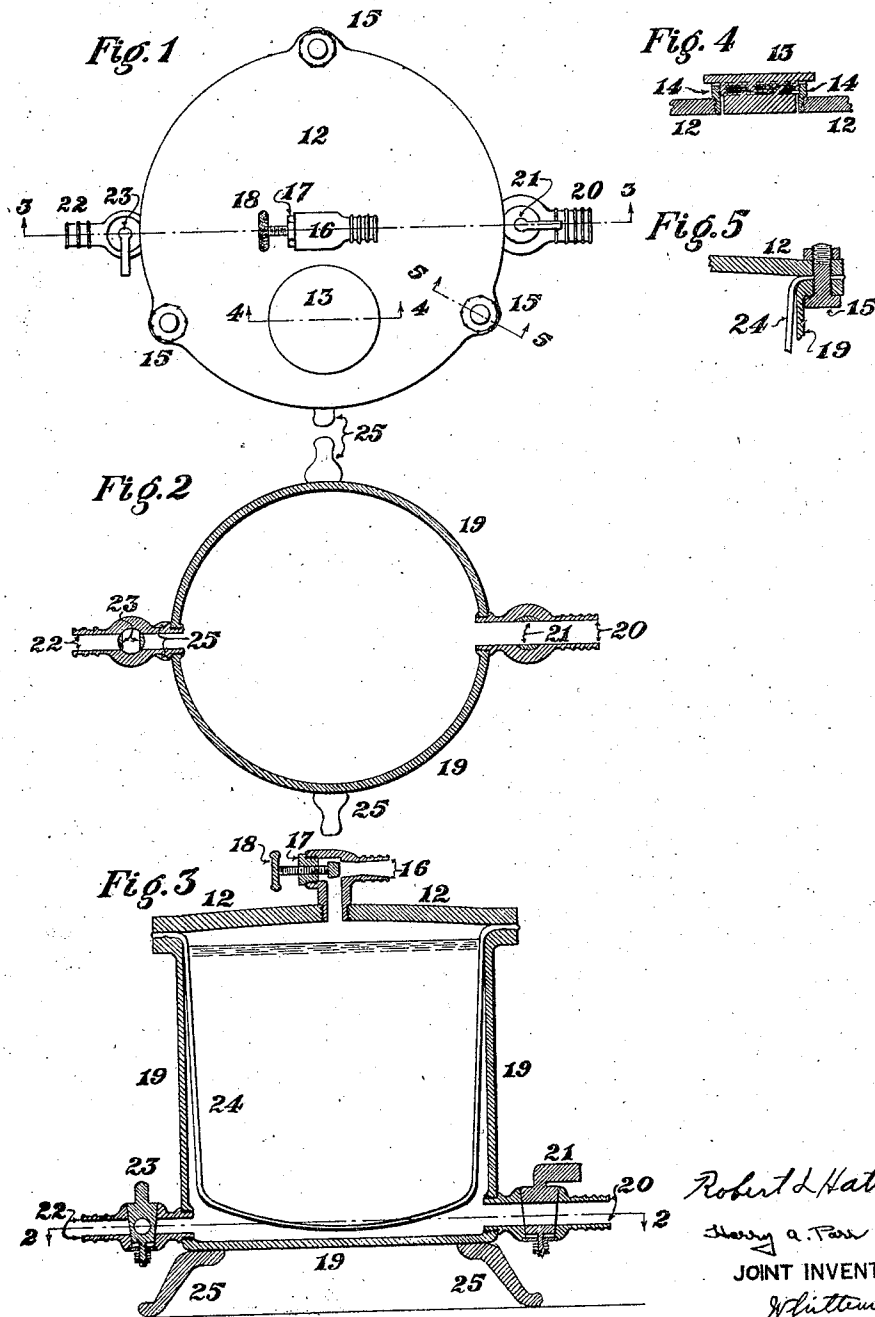
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R. L. HATCHER ET AL
MOUTH CLEANSING APPARATUS

Filed Jan. 24, 1921

2 Sheets-Sheet 1



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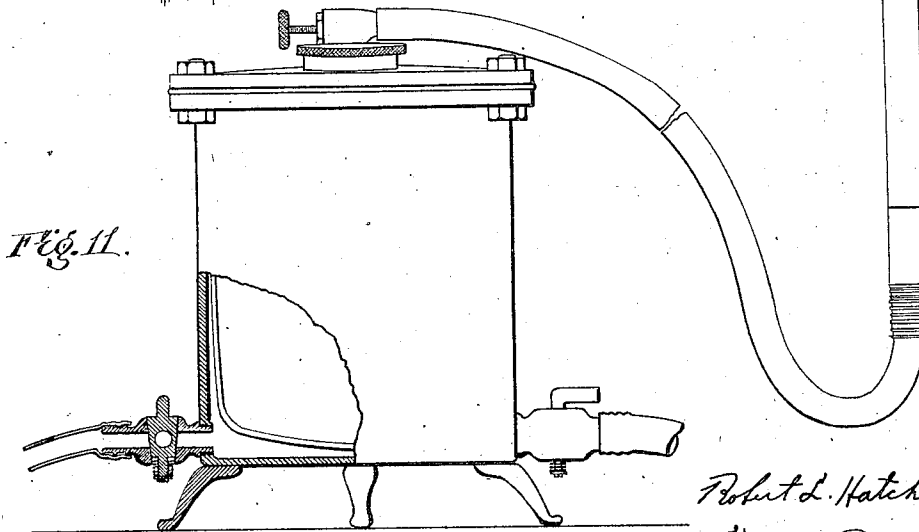
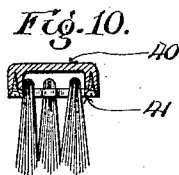
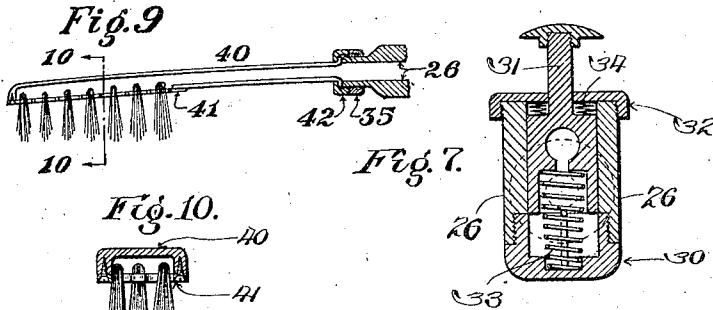
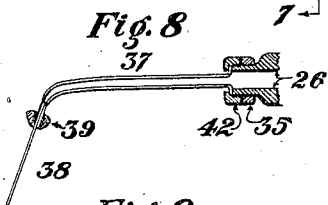
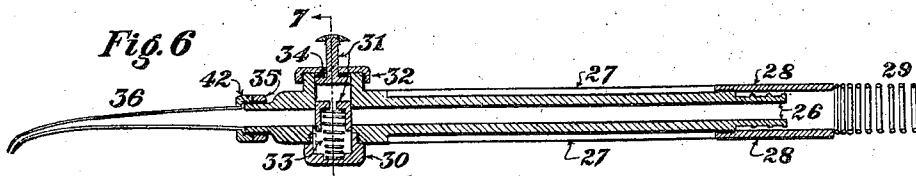
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UNITED STATES PATENT OFFICE.

ROBERT L. HATCHER AND HARRY A. PARR, OF DETROIT, MICHIGAN.

MOUTH-CLEANSING APPARATUS.

Application filed January 24, 1921. Serial No. 439,369.

To all whom it may concern:

Be it known that we, ROBERT L. HATCHER and HARRY A. PARR, both citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Mouth-Cleansing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to an apparatus for an original method of cleansing and disinfecting the teeth, gums, tissues of the oral cavity, the nasal tract and wounds and infected or irritated areas of the human body. The objects of the invention are the prevention of the various diseases of the gums, tissues of the oral cavities, dental caries and the cleansing out of the nasal cavities, antrum or other infected areas, which objects are obtained by the use of suitable fluids (as alkaline mouth washes, normal salt solutions, pure water, hydrogen peroxide, etc.) under a velocity head attained through a pressure developed through the hydraulic head of the city, municipal or domestic water supply and applied to the various tissues through various nozzle attachments at regulated rates of discharge and velocity. We attain these objects by the apparatus illustrated in the accompanying drawings, in which

Figure 1 is a plan view of the top of the pressure chamber showing the regulator valve for the cleansing fluid, the filler cap, and the inlet and outlet valves for the city, municipal or domestic water supply;

Figure 2 is a horizontal section passing the inlet and outlet valves of the direct pressure supply, in the pressure chamber, looking downward;

Figure 3 is a vertical section passing through the center line of the pressure chamber showing the three valves, the top or head and the collapsible rubber bag containing the cleansing fluid;

Figure 4 is a vertical section passing through the center line of the filler cap of the rubber bag;

Figure 5 is a vertical section through one of the three clamp nuts which hold the head or top of the pressure chamber to the main part containing the rubber bag;

Figure 6 is a section through the center line of the handpiece, showing the piston valve and nozzle attachment;

Figure 7 is a section through the center

line of piston valve in the handpiece at right angles to the section shown in Figure 6;

Figure 8 is a section through the center line of the nozzle which is used in washing out pyorrhea and abscess pockets;

Figure 9 is a section through the center line of the spray toothbrush;

Figure 10 is a section through the spray toothbrush proper taken at right angles to the section on line 10—10 of Figure 9;

Figure 11 is an elevation and partial section of the pressure chamber and handpiece and nozzle.

The description of the various parts of the apparatus in detail is as follows:

The apparatus consists of two main parts, (a) pressure chamber, (b) handpiece.

(a) In the specific construction as illustrated the pressure chamber consists of a pot 19 mounted on four legs 25, an inlet valve consisting of a tapered plug 21 and outer case 20 which is threaded at one end so as to screw into the pot 19 and on the other end having circular ribs on the outside in order to securely hold the flexible tube from the city, domestic or municipal water supply, an outlet valve consisting of a tapered plug 23 and an outer case 22 of similar construction to the inlet valve, both inlet and outlet valves having a washer and a spring under compression to keep the tapered plugs 23 and 21 tightly in place. On the top of the pot 19 is a head 12 which is tightly bolted by bolts 15 to the flange of the pot 19 and at the same time securely holding in place the collapsible rubber bag 24 and preventing leakage of the contained fluid in either chamber. The head 12 contains the filler cap 13 and shoulder 14, through which the cleansing solution is poured into the bag 24, and the regulator valve consisting of a tapered plug on a threaded spindle 18, a nut 17 and an outer casing 16. The cap 13 is provided with a coarse thread which screws into a wear-resisting shoulder 14 which in turn screws into the head 12 of the chamber. The case 16 of the regulator valve screws into the head 12. This case 16 is also provided with raised ribs at one end for firmly holding the flexible tube to the handpiece and at the opposite end is internally threaded to receive the nut 17 through which the plug and spindle 18 is screwed. An adjustment of flow is thus obtainable at all times by turning the spindle 18.

(b) The handpiece consists of an outer

barrel 26 threaded at one end to receive the various nozzle attachments by means of the clamp nut 42 and lock nut 35 and at the opposite end to receive the sleeve 28 to which is soldered the flexible spring 29 which tends to prevent pulling or shutting off of the flexible tube which fits tightly over the ribs on the barrel end from the pressure chamber. This barrel 26 is partially covered with ebonite 27 to add to the appearance of the handpiece. At right angles to the longitudinal hole in the barrel 26 is a larger hole to receive the sliding piston 31 of the piston shutoff valve. The circular piston 31 is provided with a small pin or lug which slides in a groove in the barrel 26 and the cap 30, thus preventing its turning during operation. Between the cap 30 and the piston 31 is a spring 33, which fits into a hole in the base of the piston 31, which tends to keep the piston 31 always at the top of the hole and against the small rubber washer 34 and the cap 32. At the top of the hole in the piston 31 containing the spring 33 is another small hole which allows any fluid which may have escaped into the spring chamber to pass into the main opening in the barrel 26, thus making it always easy to work the piston shutoff valve. This piston 31, which is slightly larger than the longitudinal hole in the barrel 26, is ground to a perfect fit, which together with the rubber washer 34 reduces leakage to a minimum. Caps 30 and 32 screw into place. The nozzle 36 may be made with a large or small diameter opening and is intended for use as a tooth and socket washer, wound and infected area cleanser or nasal track and antrum cleanser. This nozzle 36 is clamped in place by means of the clamp nut 42 and lock nut 35. The nozzle consisting of the tube 37, needle tube 38 and lock sleeve 39 is intended for washing out pyorrhea pockets at the roots of teeth and abscesses. The tube 37 is split at the end so that when the tapered lock sleeve 39 is pushed on, it firmly grips the needle tube 38. The nozzle, consisting of the tube 40 open at the end where the bristle plate 41 is attached by means of small screws as shown in Fig. 10, is the toothbrush attachment and by means of small openings in between the bristles water is forced through the bristles and unto the teeth to be cleaned, thus aiding in the cleansing operation. The handpiece and nozzles are made of corrosive-resisting metal or material such as phosphor bronze, etc.

Operation in detail.

The rubber bag 24 is first filled with the warm cleansing solution through the filler cap 13. The cap 13 is then screwed into the casing 14 and the pressure chamber is ready for operation. By opening the valve 20—21

water under the hydraulic head of the city, municipal or domestic water supply is admitted to the pressure pot or chamber 19. As the valve 22—23 is closed during this operation, the rubber bag 24 containing the cleansing solution is forced upwards and inwards by the resultant outer pressure, thus creating an equilibrium pressure in the cleansing solution, counteracting the external pressure on the bag 24. Thus no serious stresses are produced in the rubber bag 24.

This cleansing fluid is then forced through the regulator valve 16—17—18 when it is opened and regulated by means of the threaded spindle 18 and may be adjusted to the desired degree of flow. The cleansing solution then passes on to the handpiece where it is controlled by means of the piston valve 30—31—32—33—34 by merely pressing down the plunger cap with the thumb or finger of the operator's hand. The cleansing solution then passes through the nozzle used to the parts of the body to be cleansed. When the nozzle 36 having an opening of $\frac{3}{4}$ " or $\frac{1}{16}$ " is used as a tooth and socket cleanser, the high velocity of the fluid due to the reduced area of section and sudden impact caused by releasing the valve sharply will clean very thoroughly and effectively remove food or foreign matter from the teeth, gums, sockets and oral cavities, thus preventing and reducing the previously mentioned diseases. The apparatus is primarily intended for the cleansing of the various parts of the head, but can also be conveniently used for other parts of the body. When through using the apparatus, the filler cap 13 is unscrewed and the outlet valve 22—23 opened, allowing the water in the pressure chamber 19 to drain off and the rubber sack 24 to return to its original position. The apparatus described holds approximately one quart of cleansing solution, which is considered ample for most uses.

An important advantage of our construction is that it permits of using any desired cleansing fluid and discharging the same under the full pressure of the water system. The apparatus may be easily installed and if desired, may be permanently connected into the hydraulic system in a convenient and accessible location.

What we claim as our invention is:

1. The combination of an outer casing, a collapsible container within said casing, a capped fill opening for said container, means for connecting said outer casing alternatively with a source of hydraulic pressure and a waste conduit, a conduit leading from said collapsible container provided with a flexible section terminating in a handpiece, means for variably restricting the flow through said conduit, a discharge nozzle engageable with said handpiece, and

a valve in said handpiece controlling the discharge through said nozzle.

2. The combination of an outer casing, valve controlled inlet and outlet connections to said casing respectively leading to a source of hydraulic pressure and a waste conduit, a flexible liquid-proof bag within said casing constituting a collapsible container, a cover for said casing constituting a clamp for said bag, a capped fill opening in said cover, an outlet fitting said cover, a valve for variably restricting said outlet fitting, a flexible conduit leading from said fitting, a handpiece at the outer end of said conduit, means for exchangeably engaging with said handpiece, a nozzle including a brush having a liquid discharge jet there-through, and a valve for controlling the discharge through said nozzle.

3. The combination with a collapsible container, of a chamber surrounding a portion of said container, valve controlled means for connecting said chamber with a source of hydraulic pressure, a flexible conduit leading from said container, means for regulating the discharge through said conduit, a discharge nozzle at the end of said

conduit, and means for controlling the discharge from said nozzle.

4. The combination with a collapsible container, of a chamber surrounding a portion of said container, manually operated valve controlled means for connecting said chamber with a source of hydraulic pressure, a conduit leading from said container, means for regulating the discharge through said conduit, a discharge nozzle at the end of said conduit, and means for controlling the discharge from said nozzle.

5. The combination with a collapsible container, of a metallic receptacle surrounding a portion of said container, valve controlled means for connecting said receptacle with a source of hydraulic pressure, a conduit leading from said container, rotatable means for regulating the discharge through said conduit, a discharge nozzle at the end of said conduit, and means for controlling the discharge from said nozzle.

In testimony whereof we affix our signatures.

ROBERT L. HATCHER.
HARRY A. PARR.