E. CARPENTER.

SURGICAL INSTRUMENT.

APPLICATION FILED NOV. 21, 1917.

1,314,855. Patented Sept. 2, 1919.

Fig. 1.

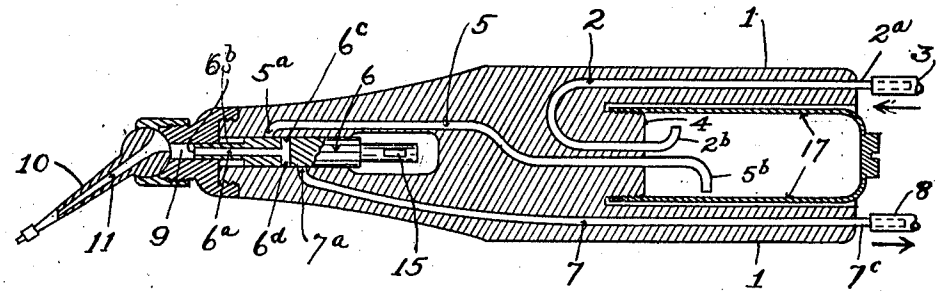


Fig. 2.

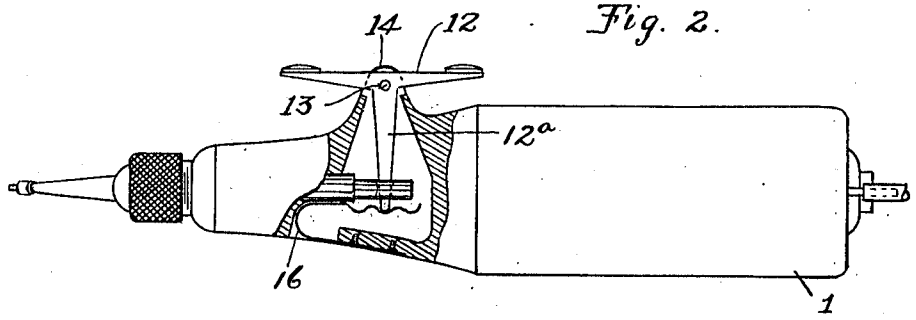


Fig. 3.

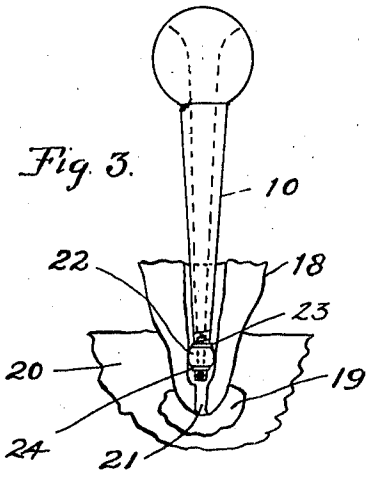
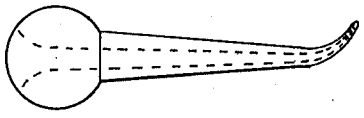


Fig. 4.



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UNITED STATES PATENT OFFICE.

EUGENE CARPENTER, OF OAK BLUFFS, MASSACHUSETTS.

SURGICAL INSTRUMENT.

1,314,855. Specification of Letters Patent. Patented Sept. 2, 1919.

Application filed November 21, 1917. Serial No. 203,086.

To all whom it may concern:

Be it known that I, EUGENE CARPENTER, a citizen of the United States, residing at Oak Bluffs, in the county of Dukes, State of Massachusetts, having invented a certain new and useful Improvement in Surgical Instruments, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to tools or instruments for applying cleansing or disinfecting solutions, or medications, to sores or diseased tissues located in subcutaneous portions of the body, or in inaccessible or hidden positions therein.

More especially my invention consists in an instrument of the character described by which such solutions or medications may be alternately introduced into the place under treatment, and then withdrawn therefrom; with the capacity of repeating fresh applications and withdrawals as many times as desired; all these results being effected without removal or shifting in position of the instrument, but merely by the manipulation of suitable means with which my instrument is provided, and preferably operable by the pressure of a finger or thumb.

My invention finds one of its principal applications in dental work for the treatment of disease in the alveolar process or of ulcers or sores located near the base of the tooth or in the jaw. I have in consequence, in this application, shown and described my invention as embodied in an instrument designed for this especial use, without, however, thereby intending to limit its use in such manner.

My invention is shown in one of its preferred forms in the drawings which form a part of this application and is described in this specification by reference to such accompanying drawings.

In said drawings,—

Figure 1 shows, in medial longitudinal section a dental instrument embodying my invention.

Fig. 2 shows a side elevation of said instrument, partly in section.

Fig. 3 is a view in section on an enlarged scale showing the introducing nozzle of an instrument designed for dental work, in operative position with respect to a tooth under treatment.

Fig. 4 shows an introducing nozzle more especially designed for the treatment of boils, hypodermic sores, or the like; the same being shown on a somewhat larger scale than the nozzle in Fig. 1.

Referring to the drawings,—

1 represents the body of the tool or instrument, preferably composed of pulp or other suitable material molded into shape while in a plastic condition, and thereafter allowed to set or harden. Traversing the body of the instrument are channels preferably embodied in pipes bent to shape and positioned in the proper location in the mold in which the body is shaped, so as to become permanently incorporated in the plastic mass of which the body is molded. Said channels or pipes are disposed as follows: Pipe 2 leads from an external position 2^a, forming an extension adapted to receive a flexible hose pipe 3 and emerges from the threaded boss 4 which is located in the central part of the body. Pipe 5 also emerging from the same boss 4 leads to a port, 5^a, opening through the wall of a valve chamber, which contains the valve 6 preferably axially located in the forward part of the body. Pipe 7 leads from port 7^a also opening into said valve chamber, to an external extension 7^c located preferably at the rear of the body and adapted to receive the hose 8.

Said valve 6 is preferably arranged to slide longitudinally within, and in leakage proof relation with respect to the walls of the valve chamber, and is provided with appropriate means, hereinafter to be described in detail, by which longitudinal position of said valve in said valve chamber may be controlled. By preference the forward end of said valve is provided with a projecting portion 6^a of reduced diameter, adapted to slide in close fitting relation within a longitudinal hole 9 leading to the end of the tool where an introducing nozzle 10 is carried at the end of the tool by a ball and socket joint or by other means calculated to permit angular adjustment in position with respect to the body.

A passage 11 extends throughout the length of the introducing nozzle, and in forming the ball and socket joint by which said nozzle is attached to the tool end, suitable provision is made so that the said noz-

zle passage is in communication with said longitudinal hole 9 during its entire range of angular adjustment.

The valve 6 is provided with an interior passage 6^b traversing the valve extension 6^a and extending rearwardly through the body of the valve for a portion of its length; then branching outwardly to outlets 6^c and 6^d located on the circumference of the valve. The location of the valve in the valve seat, and of the said branch outlets in the valve are so arranged in position with respect to the ports 5^a and 7^a, that at the forward limit of movement of the valve 6 one of said outlets, as for example 6^c, is in registration with the port 5^a, at the rearward limit of movement the other outlet, as for example 6^d, is in registration with the port 7^a.

The preferred mechanism for controlling the operation of the valve 6 is as follows: A T-shaped lever 12 is pivotally carried on the pin 13 mounted in ears 14 formed on said lever. A valve operating arm 12^a, forming a part of said lever, extends downwardly through a cutaway portion of the tool-body and engages within a slot 15 formed in the rear end of the valve 6. The extreme end of said arm 12^a bears against a spring 16; which spring preferably has depressions formed therein. When said lever end 12^a rests in the central depression on the spring the relation of operating parts is such that the valve is positioned in the neutral or inoperative position. When said lever end is positioned in the depression in front of said central depression the valve is so located thereby as to bring the valve outlet 6^c in registration with the port 5^a; establishing communication between pipe 5 and the passage of the introducing nozzle. When the lever end is positioned in the depression at the rear of the said central depression the said valve is positioned so as to bring the valve outlet 6^d in registration with the port 7^a, establishing communication between the pipe 7 and the passage of the introducing nozzle.

A container 17 is provided which engages the exterior of the boss 4 preferably by a pipe thread connection, so as to be mounted upon said boss 4 in a leakage proof relation. When so mounted the ends of the pipes 2 and 5 are located in the interior of the container. The container is preferably provided with a slotted end to facilitate tightening in position, or subsequent detachment.

A source of pressure (not shown in the drawings but of any approved type) is provided and is connected with the pipe 2 by means of a preferably flexible tube 3 attached to the extension 2^a. In similar manner a vacuum producing source (not shown in the drawings,) is connected by means of a tube 8 engaging the extension end 7^c of the pipe 7.

The manner of using my device is described in connection with the treatment of a diseased tooth, and is as follows:

Referring more particularly to Fig. 3, 18 shows in outline a tooth under treatment more particularly for disease in the region of the alveolar process, 19 located at the base thereof within the jaw; a portion of which jaw is indicated at 20. A suitable channel 21 having been previously prepared in said tooth, leading to the diseased region, the introducing nozzle 10 of the tool is inserted as far as possible within such channel; a leakage proof connection of the introducing nozzle within said channel being established by the action of a packing washer 22 (which may be adjustable so that the end of the introducing nozzle may extend through the packing washer or be flush with it as desired) provided at the end of the introducing nozzle.

When the tool is in the desired position the rearward end of the controlling lever 12 is depressed, throwing the valve 6 into the forward position, wherein it establishes communication with the pipe 5 and the introducing nozzle. Thereupon, the tool being held so that the open end 5^b of the pipe 5 will extend downwardly into and be submersed in said contents as is shown in Fig. 1, the pressure transmitted from the source of pressure through the hose 3 and pipe 2 to the interior of the container 17 will force a portion of the contents of the container into the region of the tooth under treatment; a sufficient degree of pressure being employed to insure that the solution or medication penetrates to the place under treatment.

After the expiration of the period required to allow the solution or medication to act, the forward end of the controlling lever is depressed, throwing the valve 6 into the position wherein it establishes communication between the pipe 7 and the passage of the introducing nozzle. In such valve position the solution just previously introduced will be sucked out and removed from the place under treatment. Thereafter by suitable manipulation of the valve controlling lever a fresh supply of solution or medication may be forced to the part under treatment and later removed, and this process of introduction and removal may be continued so long as a supply remains in the container without disturbing the position of the instrument. It should be noted that the necessary manipulations can readily be effected by the fingers of the hand by which the instrument is held in operating position.

Where a subcutaneous sore, as for example a boil or ulcer pocket, is to be treated, I employ an introducing nozzle in the general

form of a stiletto point terminating in a perforated end having the usual characteristics of a hypodermic needle. Said stiletto point is of such dimensions as to permit the needle end of the same to be introduced into the interior of the boil or ulcer pocket by penetrating the flesh tissues by which the same is inclosed; my idea being to obtain access through the ulcer wall to the said interior by the stretching or pressing away of the nerves and other fibers embodied in the tissues of the said wall adjacent the point of penetration as distinct from the cutting or lancing of the same, which would sever many small nerves not liable to reunite again when the cut healed. When the stiletto point has been so introduced, the boil or ulcer pocket may be interiorly flushed with cleansing solutions or treated with medications by alternate applications and subsequent withdrawals thereof, effected by the manipulating of the valve lever in the same general manner as has been hereinbefore described.

What I claim as my invention is:

1. A surgical instrument comprising a body, a receptacle for containing a fluid removably attached to said body, a pressure passage in said body leading into the interior of said receptacle and supplying a pressure upon said fluid, a discharge passage in said body, leading from said receptacle interior and arranged for the discharge of said fluid therethrough, an exhaust passage maintained in a state of vacuum, a nozzle, and selective means for placing said nozzle either in communication with said discharge passage or with said exhaust passage.

2. A surgical instrument comprising a body, a nozzle attached to the body and having a passage therethrough, a pressure supply passage and a fluid discharge passage contained in said body, a fluid containing receptacle removably attached to said body and so located thereon with respect to said pressure supply and fluid discharge passages that the outlet end of the former and the intake end of the latter are included in its interior, an exhaust passage contained in said body, and a valve movably mounted in said body and arranged to establish, in one operative position communication between said discharge passage and said nozzle passage, and in another operative position communication between said exhaust passage and said nozzle passage.

3. A surgical instrument comprising a body provided with a receptacle-receiving boss, a fluid containing receptacle removably attached to said boss, a pressure supply passage opening through said boss into the interior of said receptacle, a nozzle having a passage therethrough, a valve chamber located in said body, a fluid discharge passage leading from said receptacle interior through said boss to said valve chamber, an exhaust passage maintained in a state of vacuum and leading through said body to said valve chamber, a valve slidably carried in said body and communicating with said nozzle passage, said valve being adapted to connect the nozzle passage, in one operative position with the fluid discharge passage, and in another operative position with the exhaust passage.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE CARPENTER.

Witnesses:
NATHAN B. DAY,
CHAS. F. RANDALL.