

[54] **METHOD FOR CLEANING CAVITIES WITH A COMBINED FLUID DELIVERING AND ASPIRATING INSTRUMENT**

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[63] Continuation of Ser. No. 183,973, Sept. 27, 1971, abandoned.

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[58] Field of Search 128/276, 278, 240, 241, 128/242; 32/40 R, 35, 57, 58

References Cited

UNITED STATES PATENTS

1,189,735 7/1916 Quintin 32/40

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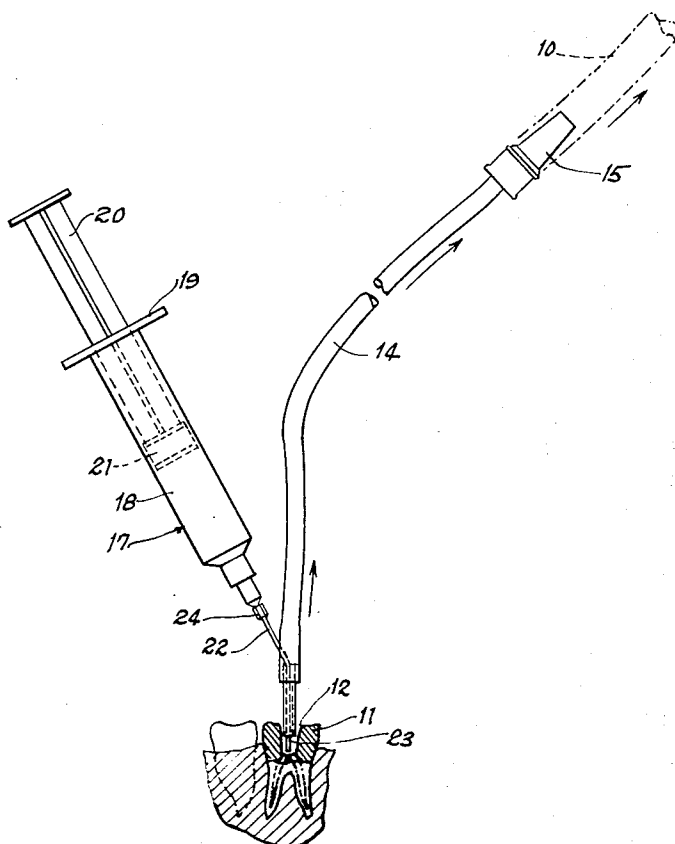
ABSTRACT

The present invention relates to a method for cleansing a cavity with a combined fluid-delivering and aspirating instrument wherein nested hollow members are utilized having open ends adapted to enter a chamber or cavity such as a tooth cavity. The inner hollow

member supplies fluids such as medicaments, antiseptics or other liquids to the tooth cavity from a suitable source and the outer hollow member aspirates material, including the liquid, blood and filings from the cavity. The outer hollow member is connected to a source of vacuum or an aspirating device and may include a separable tubular insert telescoped in the outer end of the outer hollow member. The inner hollow member is preferably in the form of a hypodermic needle or cannula which forms part of a reservoir constituting a source of fluid, e.g., the barrel of a hypodermic syringe. The outer hollow member or members are formed of a material such as a plastic composition which the needle may readily pierce or puncture and which is self-sealing to enable a fluid-tight seal at the puncture. The outer open ends of the tube and insert and the outer open end of the needle may be termed the working ends thereof.

The hypodermic needle preferably extends slightly beyond the end of the outer hollow member into the cavity and is bent so that the upper end extends outwardly of the outer hollow member above the point where the end thereof enters the outer hollow member. It is unnecessary to otherwise fasten the hypodermic needle to the aspirating tube but, for integrity, this is preferably done. In any case, the arrangement is such that the outer hollow member and cannula are axially adjustable.

8 Claims, 2 Drawing Figures



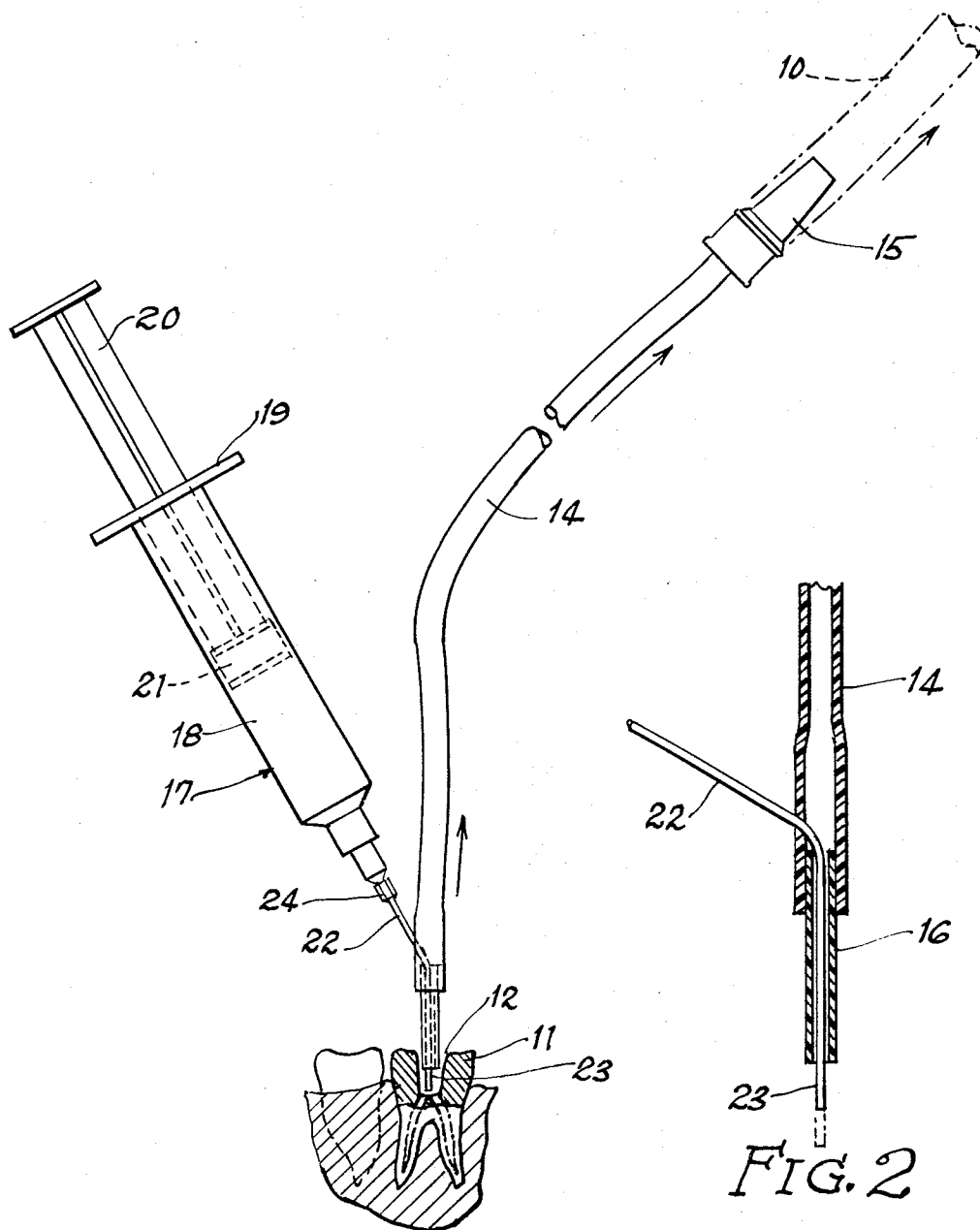


FIG. 1

FIG. 2

METHOD FOR CLEANING CAVITIES WITH A COMBINED FLUID DELIVERING AND ASPIRATING INSTRUMENT

This is a continuation, application Ser. No. 183,973, filed 27 Sept. 71 and now abandoned.

BACKGROUND OF THE INVENTION

In the art of using hand-held dental instruments for delivering a fluid to a tooth cavity and aspirating the fluid and any other foreign matter, such as particles of bone, therefrom and similar purposes, problems have been encountered in providing and using a compact instrument which includes sterilizable parts capable of being readily and cheaply replaced. The present invention provides a hand-held instrument satisfying these objectives.

DESCRIPTION OF THE PRIOR ART

It has been proposed, as shown in U.S. Pat. No. 3,164,153, dated Jan. 5, 1965, particularly FIG. 5, to provide a dental instrument wherein two tubular needles are joined at one end to enter a tooth cavity. One connects with a source of medicinal liquid and the second with a source of vacuum to collect liquid and tooth fragments drawn from the tooth cavity. However, such apparatus is cumbersome, occupies considerable space within the mouth of the patient and is difficult to sterilize or readily provide with replaceable parts.

It has also been proposed in U.S. Pat. No. 3,208,145, dated Sept. 28, 1965, to provide an aspirating hand-piece with controls for vacuum, air and water, wherein the vacuum source is connected to one tube and the air and water sources are connected to other smaller tubes which are secured to or lie along the side of the outer surface of the vacuum tube. This device is also space-consuming and is difficult to maintain in a sterile condition or to utilize replaceable, inexpensive parts.

SUMMARY OF THE INVENTION

The invention herein utilizes a tube of a plastic composition which is resilient but generally shape-retaining and self-sealing if punctured, e.g., polyethylene, the working end of which, or an extension thereof, is adapted to enter a cavity from which material is to be aspirated, such as a tooth cavity, and a hypodermic needle or cannula passing through the wall of the tube and extending into the tube and also into the cavity for supplying fluids such as medicinal or antiseptic liquids to the cavity. The smaller or extension tube is to provide a reduced end for entrance to the cavity, but the main tube could, if desired, be formed with a reduced end.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a view of the dental instrument including a partial sectional view of a tooth of a patient, with the tube for conveying liquid to the cavity and for aspirating material therefrom positioned in the cavity.

FIG. 2 is a partial enlarged sectional view of the end of the tube and extension insert shown in FIG. 1, with the hypodermic needle shown in elevation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The novel dental instrument of this invention is used, for example, to supply medicinal or antiseptic fluid or the like to a cavity 12 in a tooth 11 of a patient.

An aspirating tube 14 is provided and is connected by a nipple 15 to a source of vacuum or an aspirator source 10. The tube 14 is preferably formed of a plastic composition, having the characteristics mentioned above, e.g., polyethylene. A tubular insert or extension 16, preferably formed of a resilient material capable of being sterilized, e.g., Teflon, is a press fit into the working end of the tube 14 (FIG. 2). This reduction in diameter is for convenience of introduction into the cavity. Alternatively, the insert may be omitted and the lower end of the tube 14 may be reduced in diameter. However, the inserted piece 16 is preferred since, by so doing, commonly available stock tubing may be employed for both pieces and sterilization simplified. The distal end of the insert 16 is adapted to extend into the tooth cavity 12.

In order to supply liquids, such as medicinal fluids or antiseptic fluids (although gas or air could also be supplied) a hypodermic syringe 17 is utilized. The syringe is of standard construction and includes a barrel 18, a finger grip 19 and a plunger 20 having a piston 21 at the lower end thereof extending into the barrel 18 to force liquid therefrom. The cannula 22, which is preferably bent at a fairly acute angle to its axis, pierces the soft plastic tube 14, as best shown in FIG. 2, in fluid-tight sealing relationship therewith. In the operative assembly, the needle extends slightly below the lower end of the tube 16 into the tooth cavity 12. By making the end of the needle blunt, access to the bottom of the tooth cavity is rendered simpler. The method of assembling the needle and aspirating tube allows vertical adjustment thereof to accommodate to the geometry of the cavity. In this way, liquid remaining in the cavity at any one time may be regulated. In conventional hypodermic syringes the cannula 22 is detachably secured by a quick disconnect member 24.

At this juncture it will have become apparent that the entire instrument comprises readily available parts which are readily assembled in a matter of minutes without the use of special tools. In operation the syringe 17 is filled with the desired liquid and the tube 14 is connected to the vacuum source which is under the control of the operator as is well known. As liquid is supplied to the cavity through the cannula 22, the aspirating tube 14 will concurrently remove any blood and other liquids and debris, such as tooth filings. By reason of its inexpensive construction, the device is expendable. However, if desired, the apparatus may be sterilized and reused.

It will be apparent that the apparatus is very compact, may be inserted into the mouth of the patient and into a tooth cavity very easily and without unduly discommoding the patient. The concentric arrangement of aspirating tube and cannula enables entrance into a very small cavity. It is also clear that the instrument may be utilized in surgical procedures generally where irrigating and aspirating are to be performed concurrently in a field having restricted accessibility.

What is claimed is:

1. A method particularly useful in dental and surgical procedures for cleansing a cavity by aspirating fluids

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and other materials from a cavity and delivering fluids such as medicaments into said cavity comprising inserting into the cavity the working end portion of a plastic suction tube of a self-sealing composition having memory when penetrated, the working end portion having the working end portion of a hypodermic needle which has been inserted through the wall of said tube portion in fluid-sealing relationship interiorly positioned in substantially coaxial relationship with the interior of said tube portion, the working end portion of the needle having been bent at an acute angle to the needle axis so that the portion of the needle remaining outside the tube for the attachment of a hypodermic syringe is at an angle to said suction tube, attaching a hypodermic syringe filled with the selected liquid to said needle, connecting the distal end of said suction tube to a vacuum source and simultaneously, or in selected independent sequence, delivering the liquid from the syringe into the cavity and withdraw liquid and other matter from said cavity through said suction tube.

2. The method according to claim 1 wherein the working end of the needle and the working end of the suction tube are vertically adjusted with reference to each other to accommodate the geometry of the cavity.

3. The method according to claim 2 wherein a tubular extension is fitted into the working end of said tube and the working end of said needle is inserted through said tube wall above said extension.

4. The method according to claim 3 wherein the extension is of readily-puncturable material and the needle pierces both the suction tube and the extension.

5. A method particularly useful in dental and surgical

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procedures for cleansing a cavity by aspirating fluids and other materials from a cavity and delivering fluids such as medicaments into said cavity comprising inserting the working end portion of a hypodermic needle which is bent at an acute angle to its axis through the wall of a plastic suction tube adjacent the working end thereof in substantially coaxial relationship with the interior of said tube to define an annular passageway therebetween, said tube being of a soft composition having memory which will form a fluid-tight seal when the tube wall is penetrated by said needle, connecting the distal end of said tube to a vacuum source, attaching a hypodermic syringe filled with the selected fluid to said needle, inserting the working end portion of said tube with the interiorly positioned needle into said cavity and simultaneously, or in selected independent sequence, delivering the fluid from the syringe through the needle into the cavity and withdrawing liquid and other matter from the cavity through the suction tube.

6. The method according to claim 5 wherein the working end of the needle and the working end of the suction tube are vertically adjusted with reference to each other to accommodate the geometry of the cavity.

7. The method according to claim 6 wherein a tubular extension is fitted into the working end of said tube and the working end of said needle is inserted through said tube wall above said extension.

8. The method according to claim 7 wherein the extension is of readily-puncturable material and the needle pierces both the suction tube and the extension.

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