

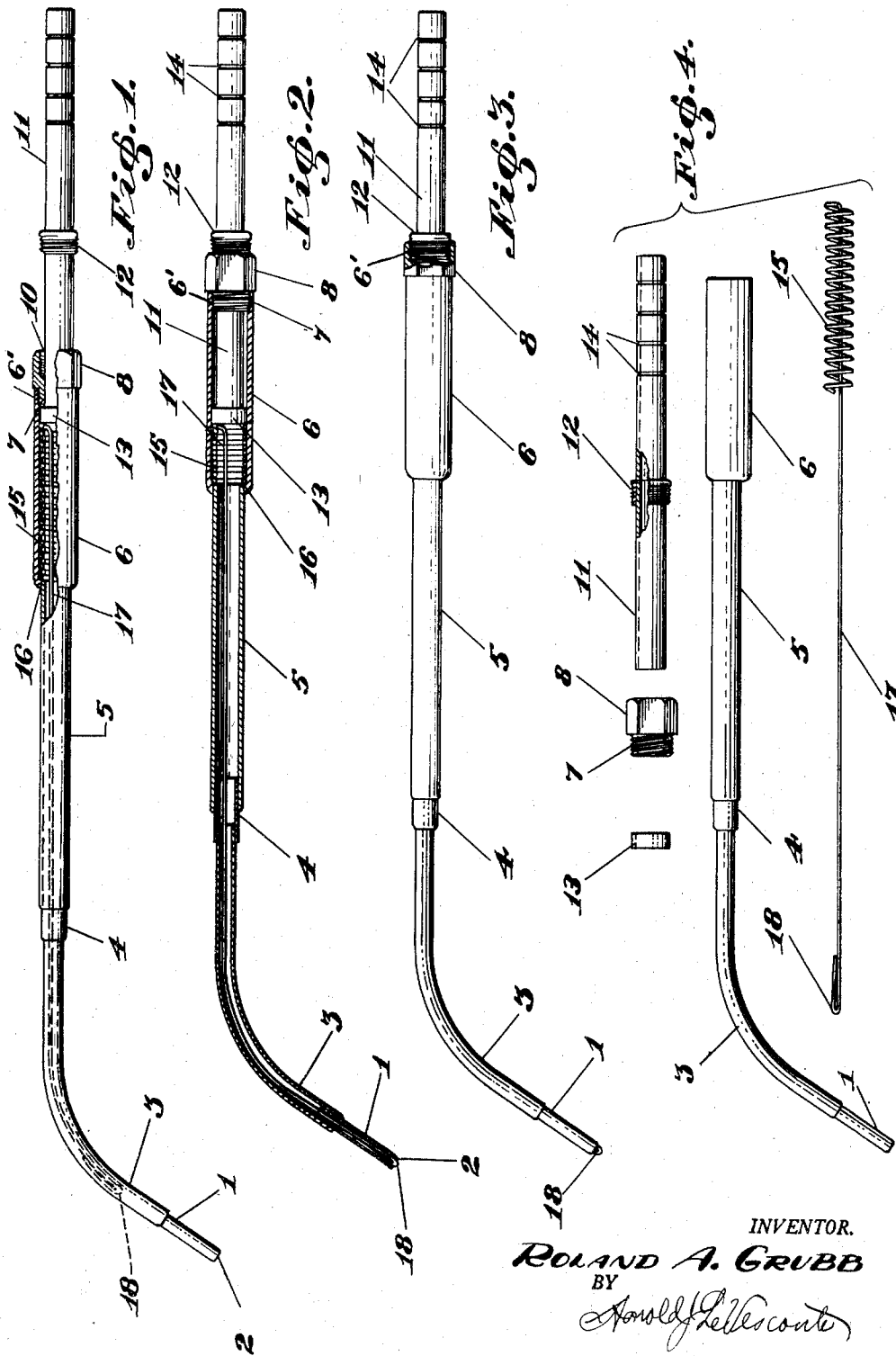
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DENTAL ASPIRATOR

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DENTAL ASPIRATOR

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This invention relates to aspirators for removing blood and other debris which accumulate in the course of exodonty and other dental and surgical operations and particularly to an improved form thereof in which certain desirable objectives, as hereinafter set forth, are successfully realized.

An object of the invention is to provide an aspirator having a small intake orifice adapted to enter small cavities and which includes means for ejecting any clogging material from the orifice.

Another object of the invention is to provide an aspirator having means by which, at the option of the user, the intake orifice can be so arranged that it can be used in close proximity to soft tissue without danger that the tissue will be drawn across or into the orifice.

A further object of the invention is to provide an aspirator in which the same means that operates to eject clogging materials also serves to modify the intake orifice to prevent objectionable contact of the orifice with soft tissue.

Still another object of the invention is to provide an aspirator which is of simple design; composed of few parts, is readily operable, and which may be quickly disassembled for sterilization.

With the above objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts, and in the construction, combinations and arrangement of parts disclosed, by way of example, in the following specification, reference being had to the accompanying drawings of one mode of execution of the invention and in which drawings:

Fig. 1 is a side elevation of an aspirator embodying the invention with the parts thereof in the position of normal use; certain portions thereof broken away to show details of interior construction,

Fig. 2 is a side elevation similar to Fig. 1, but showing the body element in medial section and the parts in the position occupied incident to the ejection of clogging material,

Fig. 3 is still another side elevation similar to Fig. 1, but showing the parts interlocked to modify the intake orifice for use adjacent to soft tissue or in similar situations, and

Fig. 4 is an exploded side elevation of the component parts of the illustrated embodiment of the invention.

Referring to the drawings, there is shown an embodiment of the invention comprising a unitary body portion formed of a series of lengths

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of tubing soldered or otherwise secured together and including a tip portion 1 having an intake orifice 2 at its free end and having the other end inserted and soldered into one end of a slightly larger tubing 3. The tubing 3 is bent between its ends and at its other end is inserted and soldered in one end of a bushing 4, the other end of which is inserted and soldered in one end of a still larger tubing 5 the opposite end of which is in turn, inserted in and soldered or otherwise connected to one end of a spring housing tubing 6 which at its free end is threaded internally at 6' to receive the threaded end 7 of a nut 8. The nut 8 has an axially disposed bore 9 terminating in an internally threaded portion 10 at the outer end of the nut. The bore 9 affords guidance for a hollow rod 11 which intermediate its ends is provided with an enlarged, externally threaded collar portion 12 adapted to engage the internally threaded portion 10 of the nut 8 (see Fig. 3) and in all events to serve as a stop to limit the extent of movement of the rod 11 through the nut 8 and into the large tubing 5. In assembly, the rod 11 after insertion in the bore 9 is provided with a collar element 13 soldered or otherwise secured thereto to prevent the rod from being withdrawn from the nut 8 (see Fig. 1) and the opposite end of the rod 11 is provided with a series of concentric grooves 14 for gripping engagement with a flexible rubber tubing by which the aspirator is connected with a source of suction.

Disposed within the spring housing tubing 6 is a compression spring 15 which at one end rests against the shoulder 16 formed by the end of the tubing 5 at its juncture with the tubing 6 and which at its other end engages the ends of the hollow rod 11 and the collar element 13 mounted thereon. The spring 15 is normally slightly compressed in assembly to provide an initial loading so that it will tend to hold the rod 11 pushed out of the nut 8 to the extent permitted by the collar element 13 (see Fig. 1). The end 17 of the wire forming the spring at the end thereof engaging the rod 11 and collar element 13 extends back through the spring along the various tubing portions and terminates in a rebent end 18 which normally is positioned within the tubing 3 a short distance inwardly of the end of the tip portion 1 (see Fig. 1).

Normally, the device is used with the parts in the position shown in Fig. 1. Assuming that the device is connected with a source of suction, the tip is inserted in the cavity from which fluid is to be evacuated and held there until evacuation

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is complete. If, however, the intake orifice becomes clogged by a bit of bone or other debris, the device is removed from the cavity and by pressing the rod 11 inwardly as far as it will go, the user compresses the spring 15 which moves the spring end 17 to the left, as viewed in the drawings, with resultant projection of the re-bent end 18 out of the intake orifice and ejection of the material causing the stoppage after which evacuation proceeds in the normal manner.

In some cases the fluid must be evacuated from cavities lined, in part at least, by soft tissue and if the intake orifice were to contact such tissue the tissue would be drawn across the orifice and make it necessary either to break the suction source or to attempt to pull the device away from the tissue despite the suction; the latter being undesirable in that it may damage the tissue or cause unnecessary pain or discomfort to the patient. In such cases, the user first presses the rod 11 inwardly and turns it to engage the threads 10 of the nut 8 with those of the collar 12 (see Fig. 3) locking the spring in compressed condition and with the rebent end 18 thereof protruding from the intake orifice. In this position the orifice rim can not engage soft tissue and grip it by reason of suction since some portion of the orifice will be exposed to atmosphere when evacuation of the cavity is complete. Upon unscrewing the rod 11 from the nut 8 the spring will return the parts to the positions shown in Fig. 1.

All of the parts are of such design as to be economically manufactured and readily cleaned and sterilized. To clean the device it is only necessary to unscrew the nut 8 from the spring housing 6 which removes the tube 11 carried thereby and which makes it possible to remove the spring element from the body structure.

The advantages possessed by the device in use are obvious. First, it is capable of readily removing obstructions. Second, since the passages are all larger than the tip, any matter passing through the tip portion will not cause obstruction elsewhere in the device. Third, by the simple expedient of locking the projecting rebent end of the wire 17 beyond the end of the intake orifice, the device is made suitable for evacuating cavities without attaching itself to any soft tissue lining the cavity. Fourth, because of the small size of the tip portion, it may be inserted into relatively small cavities. Fifth, because of its simple design, it is both economical to manufacture and easy to clean and sterilize.

While I have above described and illustrated one form of my invention, I do not intend to limit myself to the exact form disclosed, and the invention embraces all such modifications in the parts, and in the construction, combination and arrangement of parts as shall come within the purview of the appended claims.

I claim:

1. A dental aspirator comprising a hollow, elongated body member having an intake orifice at one end, a hollow relatively movable element slidably mounted in the other end of said body member and adapted to be connected to a source of suction, and means contained within said body element responsive to relative sliding movement between said body member and said element effective to clear said orifice of obstructions.

2. A dental aspirator comprising a tubular body member terminating in an intake orifice at one end and in a spring housing portion at

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the other end thereof, a spring in said housing, a rod extending from said spring along the interior of said body member and normally terminating at a point short of said orifice, and means affording the connection of the interior of said body member with a source of suction said means additionally being movable relative to said body member with resultant compression of said spring with incident projection of said rod beyond the end of said orifice and clearing of any obstruction therefrom.

3. A dental aspirator comprising a tubular body member having a relatively small intake orifice at its distal end and a relatively large tubular spring housing portion at its proximal end, a removable closure means at said proximal end having an axially extending bore, a hollow rod slidably mounted in said bore having a head portion engageable with the face of said closure means within said spring housing member, a compression spring in said housing member, and a rod element extending from the proximal end of said spring to a point adjacent said intake orifice, said head portion of said hollow rod engaging the proximal end of said spring.

4. A dental aspirator comprising a hollow, elongated body member having an intake orifice at one end, a relatively movable element slidably mounted in the other end of said body member and adapted to be connected to a source of suction and means extending longitudinally interiorly of said body member responsive to relative sliding movement of said body member and element effective to clear said orifice of obstructions; said movable element including means for interlocking engagement thereof with resultant projection of the distal end of said means through said orifice said body member at one extreme of said relative movement to permit said intake orifice to be used safely in close adjacency to soft body tissue.

5. A dental aspirator comprising a tubular body member terminating in an intake orifice at one end and in a spring housing portion at the other end thereof, a spring in said housing, a rod extending from said spring along said body member and normally terminating at a point short of said orifice, a hollow member having one end thereof slidably engaging the interior of the spring housing end of said body member; said hollow member affording the connection of said body member with a source of suction and said one end of said hollow member engaging said spring and effective upon movement into said body member to compress said spring with incident projection of said rod beyond the end of said orifice and clearing of any obstruction therefrom; said members including interlocking means effective to lock said rod in said projecting position.

6. A dental aspirator comprising a tubular body member having a relatively small intake orifice at its distal end and a relatively large tubular spring housing portion at its proximal end, a removable closure means at said proximal end having an axially extending bore, a hollow rod slidably mounted in said bore having a head portion engageable with the face of said closure means within said spring housing member, a compression spring in said housing member, a rod element extending from the proximal end of said spring to a point adjacent said intake orifice, said head portion of said rod engaging the proximal end of said spring; the proximal

end of said rod being adapted for connection to a source of suction.

7. A dental aspirator comprising a tubular body member terminating in a relatively small tip portion having an intake orifice at its distal end and having an enlargement adjacent the proximal end of said tip portion, a spring biased rod element reciprocable in said body member normally disposed with its distal end in said enlargement, and hollow manually operable means extending from the interior to the exterior of said body member and having the portion thereof exterior of said body member adapted to afford connection of the interior of said body member with a source of suction; said means additionally being constructed and arranged to project the distal end of said rod through said orifice for removal of obstructions therein.

8. A dental aspirator comprising a tubular body member terminating in a relatively small tip portion having an intake orifice at its distal end and having an enlargement adjacent the proximal end of said tip portion, a spring biased rod element reciprocable in said body member normally disposed with its distal end in said enlargement, and hollow manually operable means movable axially of said body member and extending from the interior to the exterior of said body member and having the portion thereof exterior of said body member adapted to afford connection of the interior of said body member with a source of suction; said means additionally being constructed and arranged to project the distal end of said rod through said orifice for removal of obstructions therein.

9. A dental aspirator comprising a tubular body member having a tip-portion terminating in a relatively small intake orifice at its distal end, a relatively large spring housing portion at its proximal end and an intermediate portion of a series of gradually increasing intermediate diameters, a nut threadedly engaging the proximal end of said body member and having an axially disposed guide-way extending therethrough, a hollow rod mounted for reciprocation in said guide-way and having enlarged portions engageable with the ends of said guideway to limit the extent of movement in both directions, and a spring biased rod reciprocable in said body member and constructed and arranged to effect the ejection of obstructions from said intake orifice upon movement of said rod into said body member.

10. A dental aspirator comprising a tubular body member having a tip-portion terminating in a relatively small intake orifice at its distal end, a relatively large spring housing portion at its proximal end and an intermediate portion of a series of gradually increasing intermediate diameters, a nut threadedly engaging the proximal end of said body member and having an axially disposed guide-way extending therethrough, a hollow rod mounted for reciprocation in said guide-way and having enlarged portions engageable with the ends of said guideway to limit the extent of movement in both directions, and a spring biased rod reciprocable in said body member and constructed and arranged to effect the ejection of obstructions from said intake orifice upon movement of said rod into said body member; one of said enlarged portions on said hollow rod being constructed and arranged for interlocking engagement with said nut with incident locking of said rod with the distal end thereof projecting from said orifice.

11. A dental aspirator comprising a tubular body member having a tip-portion terminating in a relatively small intake orifice at its distal end, a relatively large spring housing portion at its proximal end and an intermediate portion of a series of gradually increasing intermediate diameters, a nut threadedly engaging the proximal end of said body member and having an axially disposed guide-way extending therethrough, a hollow rod mounted for reciprocation in said guideway and having enlarged portions engageable with the ends of said guide-way to limit the extent of movement in both directions, and a spring biased rod reciprocable in said body member and constructed and arranged to effect the ejection of obstructions from said intake orifice upon movement of said rod into said body member; the proximal end of said hollow rod affording means of connection with a source of suction.

12. A dental aspirator comprising a tubular body member having a tip-portion terminating in a relatively small intake orifice at its distal end, a relatively large spring housing portion at its proximal end and an intermediate portion of a series of gradually increasing intermediate diameters, a nut threadedly engaging the proximal end of said body member and having an axially disposed guideway extending therethrough, a hollow rod mounted for reciprocation in said guideway and having enlarged portions engageable with the ends of said guideway to limit the extent of movement in both directions, and a compression coil spring mounted in said housing; the proximal end of said spring forming a rod extending axially through the coils of said spring and along the intermediate portion of said body member and terminating in a rebent distal end portion normally disposed adjacent the proximal end of said tip portion constructed and arranged to effect the ejection of obstructions from said intake orifice upon movement of said rod into said body member.

13. A dental aspirator comprising a tubular body member having a tip-portion terminating in a relatively small intake orifice at its distal end, a relatively large spring housing portion at its proximal end and an intermediate portion of a series of gradually increasing intermediate diameters, a nut threadedly engaging the proximal end of said body member and having an axially disposed guideway extending therethrough, a hollow rod mounted for reciprocation in said guideway and having enlarged portions engageable with the ends of said guideway to limit the extent of movement in both directions, and a compression coil spring mounted in said housing; the proximal end of said spring forming a rod extending axially through the coils of said spring and along the intermediate portion of said body member and terminating in a rebent distal end portion normally disposed adjacent the proximal end of said tip portion constructed and arranged to effect the ejection of obstructions from said intake orifice upon movement of said rod into said body member; one of said enlarged portions on said hollow rod being constructed and arranged for interlocking engagement with said nut with incident locking of said rod with the distal end thereof projecting from said orifice.

14. A dental aspirator comprising a tubular body member having a tip-portion terminating in a relatively small intake orifice at its distal end, a relatively large spring housing portion at its proximal end and an intermediate portion of a series of gradually increasing intermediate

diameters, a nut threadedly engaging the proximal end of said body member and having an axially disposed guideway extending there-through, a hollow rod mounted for reciprocation in said guideway and having enlarged portions engageable with the ends of said guideway to limit the extent of movement in both directions, and a compression coil spring mounted in said housing; the proximal end of said spring forming a rod extending axially through the coils of said spring and along the intermediate portion of said body member and terminating in a rebent distal end portion normally disposed adjacent the proximal end of said tip portion constructed and arranged to effect the ejection of obstructions from said intake orifice upon movement of said rod

into said body member; the proximal end of said hollow rod affording means of connection with a source of suction.

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