Jan. 24, 1967 C. L. HUTSON 3,299,511

DENTAL ASPIRATOR

Filed July 9, 1962

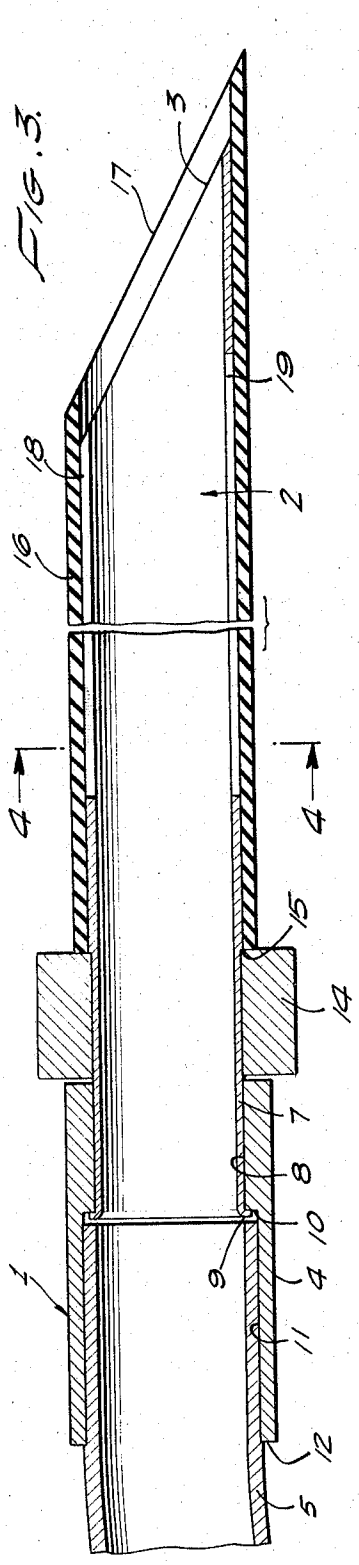


FIG. 3.

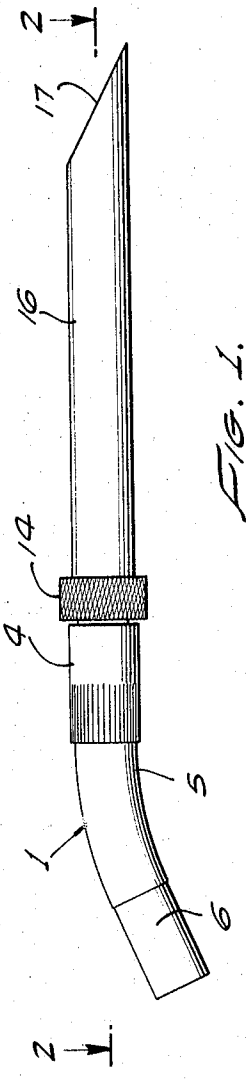


FIG. 1.

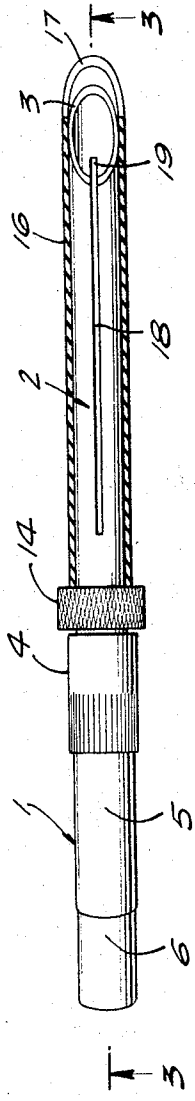


FIG. 2.

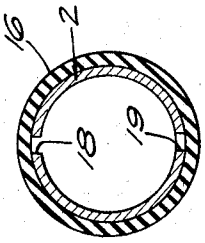


FIG. 4.

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United States Patent Office 3,299,511 Patented Jan. 24, 1967

3,299,511

DENTAL ASPIRATOR

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Filed July 9, 1962, Ser. No. 208,264
7 Claims. (Cl. 32—33)

This invention relates to a dental aspirator instrument adapted for use in connection with conventional high air flow vacuum systems presently employed in dental offices.

Certain objections have been found to attend the use of dental aspirators of the type heretofore made, particularly in selectively spot positioning the intake end of the tip of the instrument, since in so positioning the tip in the mouth of a patient, the operator is often required to effect wrist movements which are awkward and may result in excessive twisting of the flexible tube which connects the instrument with a source of vacuum. Moreover, the movements of the wrist of the operator such as required to variously position the intake end of the aspirator while a dental drill is in operation, particularly sudden movements, are likely to disturb the dentist and may cause injury of the mouth or damage of the tooth being treated.

This spot positioning of the intake end of the aspirator is most important in view of the universally used "wash field technique" in connection with high speed drills. In the use of this technique a steady flow of water and/or air spray is applied to the tooth area being prepared by the dental drill. The high speed drill and the washed field technique cause large amounts of liquids and solid matter, such as portions of a tooth, bits of filling material, cement, etc., to be collected in the mouth, and unless removed quickly and thoroughly, proper tooth treatment may be interferred with.

It is the primary object of this invention to provide an improved dental aspirator instrument which is constructed and arranged in a novel manner to eliminate the above noted objections and to serve more effectively for thoroughly removing excess fluids and solids from the mouth of the patient during the drilling of a tooth.

It is another object of this invention to provide a dental aspirator instrument of the character described in which a tip member of novel construction and having a bevelled intake end is rotatably connected with a handle in such a manner that an operator holding the handle may, with the fingers of the hand, readily turn the tip in either direction best to position the bevelled intake end with respect to a particular area of a tooth or other portion of the mouth to remove therefrom liquids and solids as required.

A further object hereof is the provision of an aspirator of the character described wherein the swivel tip is provided with a knurled operating ring or collar readily accessible to the fingers of the hand of the operator holding the handle for freely turning the rotatable tip, no unusual, awkward or appreciable movement of the wrist of the operator being required to selectively position the intake end as desired.

A further object is the provision of an aspirator such as described in which the tip is of special construction to facilitate the mounting thereon and the removal therefrom of a protective sleeve of rubber which acts as a shield to prevent thermal shock on sensitive teeth and fillings as well as mechanical shock of metal against the teeth and tissue, while also eliminating metal shock against operating instruments, burrs and stones. The rubber sleeve also extends beyond the bevelled intake end of the tip to prevent contact of the metal end of the tip with tissue of the mouth, thereby eliminating a hazard which is particularly present where the tissue is anesthetized and the patient's response is reduced.

A further object hereof is the provision of an aspirator of the character described which includes a sectional tubular handle to which the tip is swivelly mounted, the sectional construction of the handle making it possible to more thoroughly clean and sterilize the handle as well as the swivel joint between one section of the handle and the tip.

Other objects and advantages of the invention will be hereinafter described or will become apparent to those skilled in the art, and the novel features of the invention will be defined in the appended claims.

Referring to the drawing:

FIG. 1 is a side elevation of a dental aspirator instrument embodying the present invention;

FIG. 2 is a sectional view taken on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken on the line 3—3 of FIG. 2; and

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3.

The illustrative embodiment of a dental aspirator constructed in accordance with this invention as shown in the accompanying drawing, generally comprises a tubular and somewhat angular handle **1** of special construction and an especially constructed tubular and comparatively straight tip member **2** swivelled to the handle and provided with a bevelled intake end **3**. The handle and tip member may be conveniently made of suitable metal tubing capable of being thoroughly sterilized without damage, for example, stainless steel.

As here shown, the tubular handle is sectional and consists of a short socket section **4** to which the tip member **2** is swivelled, and a longer angular section **5** which has one end fitted frictionally within the socket section with its other end portion **6** somewhat reduced in outside diameter and disposed to be connected with the usual flexible hose, not shown, leading to a source of vacuum. This sectional construction of the handle makes it possible readily to separate sections thereof so that the sections, together with the swivel connection of the tip with the section **4**, are subject to being thoroughly sterilized. The outer end portion of the socket section **4** may be knurled to aid in holding the handle in the desired position when twisting the tip member **2**.

The manner in which the tip is swivelly connected to the socket section **4** of the handle is illustrated in FIG. 3, the inner end portion **7** of the tip member being slightly reduced in diameter so that it may be extended freely into the bore **8** of the socket section **4** and will be freely rotatable therein. The tip is held in place in the bore **8** after being inserted therein by having its outer end spun outwardly to form a flange **9** which abuts a shoulder **10** formed by counterboring the remainder **11** of the bore through the socket section **4**. The opposed surfaces of the bore **8** in the section **4** and end portion **7** of the tip **2** may be machined to assure that the tip will turn freely with respect to the socket section **4**. The outwardly spun flange **9** likewise has a smooth contact with the shoulder **10** so as to avoid friction in the turning of the tip relative to the socket section **4** of the handle.

The outer end portion of the angular section **5** of the handle is also slightly reduced in diameter so that a very small shoulder **12** is formed on the exterior thereof to engage the outer end of the socket section **4** so that the inner end of the section **5** will be slightly spaced from contact with the flange **9**, thereby avoiding interference with free rotation of the tip.

As a means to facilitate the turning of the tip **2** with the fingers, a knurled ring **14** of greater diameter than the handle **1** is pressed fitted on the inner end portion of the

tip 2 and abuts an annular shoulder 15 so that the ring is spaced from contact with the adjacent end of the socket section 4 of the handle. Positioned in this manner so that it is held against turning relative to the tip 2, the knurled ring 14 readily may be grasped by the fingers of the hand of the operator holding the handle so as to turn the tip 2 in either direction as desired for exact spot positioning of the bevelled intake end 3.

It should be noted that the shoulder 15 prevents outward movement of the ring 14 on the tip member and also limits longitudinal movement of the tip member relative to the handle 1 since it will abut the adjacent end of section 4 of the handle from which it is normally slightly spaced. Thus, the flange 9 and the ring 14 serve to rotatably secure the tip member to the handle without interfering with free rotation of the tip member.

As a means for preventing the metal tip 2 from coming into contact with surfaces of the mouth of the patient as well as the teeth of the patient and surrounding tissue, the tip is covered with a protective sleeve 16 made of soft rubber or other suitable cushioning material, this sleeve having a bevelled end 17 which projects beyond the bevelled end 3 of the metal tip to prevent this end from coming in contact with and possibly injuring a tooth or the tissue of the mouth. This sleeve 16 readily may be applied to the tip 2 in view of the special construction of the latter wherein a slot 18 extends longitudinally thereof from a point adjacent the knurled ring 14 and through the outer bevelled end 3. On the opposite side of the tip 2 a similar slot 19 is formed, but extends longitudinally only from adjacent the knurled ring 14 to a point spaced inwardly from the bevelled end of the tip. These slots are closed or sealed by the sleeve 16 so that they do not interefere with the vacuum action in the tip member. Moreover, these slots make it possible to squeeze and somewhat collapse the tip so that the rubber sleeve 16 readily may be fitted thereon and will be frictionally held in place by the expanding action of the slotted portions of the tip. The slots 18 and 19 also facilitate ready removal of the sleeve, since they permit water to enter between the sleeve 16 and the exterior of the tip 2 upon immersing the latter with the sleeve thereon in water, thereby providing lubrication permitting ready removal of the sleeve.

While specific structural details have been shown and described, it should be understood that changes and alterations may be resorted to without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A dental aspirator, comprising: a tubular handle adapted to be connected to a source of vacuum forming an elliptical inlet opening; a tubular, elongated, straight tip member having a bevelled intake end; means providing a swivel joint of the tip member with said handle whereby said tip member may be freely rotated relative to said handle to variously position said bevelled intake end within the mouth of a patient; and an operating ring fixed to said tip adjacent said joint in position to be manipulated for turning the tip relative to the handle by the fingers of the hand of an operator holding the handle.

2. A dental aspirator as defined in claim 1, wherein said handle is formed of two sections having bores therethrough and detachably telescopically connected to one another, said tip member being swivelly mounted in one section and the other section adapted to be connected to said source of vacuum.

3. A dental aspirator, comprising: a tubular handle adapted to be connected to a source of vacuum; a tubular, elongated, straight tip member having a bevelled intake end forming an elliptical inlet opening; means providing a swivel joint of the other end of the tip member with said handle whereby said tip member may be freely rotated relative to said handle to variously position said bevelled intake end within the mouth of a patient; a protective sleeve of cushioning material surrounding said tip

member and extending outwardly beyond said bevelled intake end; said sleeve having its extended end bevelled; and an operating ring fixed to and surrounding said tip member; said ring being of greater diameter than that of said handle and disposed between the other end of said protective sleeve and one end of said handle.

4. A dental aspirator, comprising: a tubular handle adapted to be connected to a source of vacuum; a tubular, elongated, straight tip member having bevelled intake end means forming an elliptical inlet opening; means providing a swivel joint of the tip member with said handle whereby said tip member may be freely rotated relatively to said handle to variously position said bevelled intake end means within the mouth of a patient; and an operating ring fixed to said tip member adjacent said joint in position to be manipulated for turning the tip relative to the handle by the fingers of the hand of an operator holding the handle, said tip member being substantially rigid from said swivel joint to said bevelled intake end means and said bevelled intake end means being formed of resilient material deformable to avoid injury to the tissue in the patient's mouth.

5. A dental aspirator, comprising: a tubular handle adapted to be connected to a source of vacuum; a tubular, tip member; means providing a swivel joint of one end of the tip member and one end of the handle whereby said tip member may be rotated to variously position the other end thereof in the mouth of a patient; said tip member having a slot extending longitudinally thereof; and a cushioning sleeve surrounding said tip member and closing said slot; said sleeve extending outwardly beyond the outer end of said tip member.

6. A dental aspirator, comprising: a tubular handle adapted to be connected to a source of vacuum; a tubular, tip member; means providing a swivel joint of one end of the tip member and one end of the handle whereby said tip member may be rotated to variously position the other end thereof in the mouth of a patient; said tip member having a pair of slots extending longitudinally thereof; one of said slots extending through said other end of the tip member; the other of said slots terminating short of the ends of the tip member; and a sleeve of cushioning material surrounding said tip member and covering said slots.

7. A dental aspirator, comprising: a tubular handle adapted to be connected to a source of vacuum; a tubular, tip member; means providing a swivel joint of one end of the tip member and one end of the handle whereby said tip member may be rotated to variously position the other end thereof in the mouth of a patient; said tip member having a pair of slots extending longitudinally thereof; one of said slots extending through said other end of the tip member; the other of said said slots terminating short of the ends of the tip member; and a sleeve of cushioning material surrounding said tip member and covering said slots; said sleeve extending outwardly beyond the outer end of said tip member.

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