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SALIVA EJECTOR

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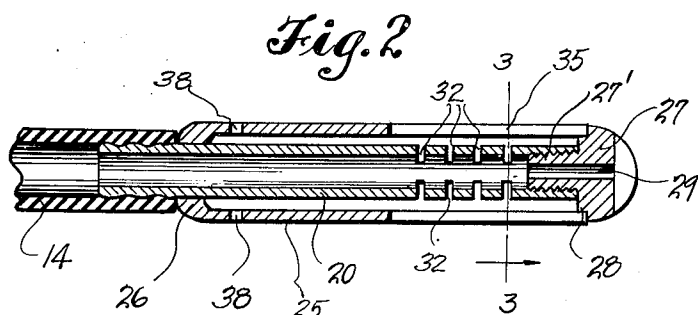
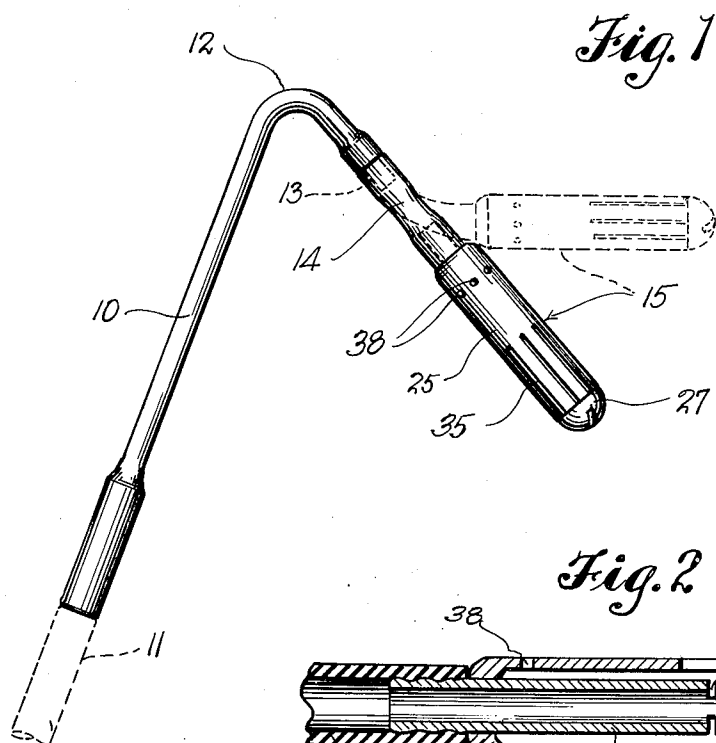


Fig. 3

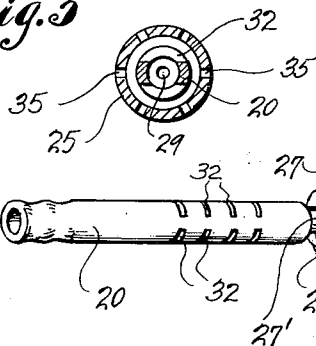


Fig. 4

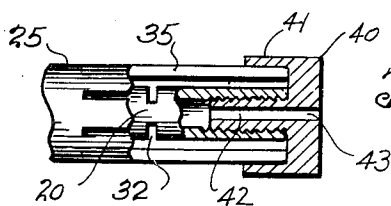
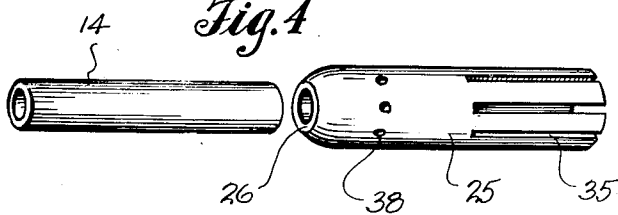


Fig. 5

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SALIVA EJECTOR

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6 Claims. (Cl. 32—33)

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This invention relates to devices which, in the dental and medical profession, are known as "saliva ejectors," and it has reference more particularly to improvements in devices of that kind employing suction for the withdrawing of saliva from the mouth of a patient while a dental or other oral operation is being performed.

Explanatory to the objects and advantages of the present invention, it will here be explained that there are now in general use various types of suction devices for saliva ejection. One type of device that is quite commonly used comprises a hook shaped suction tube or stem that may be applied over the lower tooth ridge of the mouth and which terminates at its inner end in a suction nozzle. Due to the fact that the patient's head is most generally tilted back while this device is in use, the saliva will collect at the back of the mouth away from the ejector and will not be withdrawn. Furthermore, the hook shaped part of this stem portion will invariably press the nozzle into the mouth tissue and cause discomfort to the patient. Also, the suction will operate to draw the tissues of the mouth into the saliva orifice of the nozzle and thus cause unsatisfactory functioning of the ejector and additional discomfort to the patient.

In view of the foregoing and for various other reasons, it has been the principal object of this invention to provide an improved type of suction ejector, that can be used in the usual way but without discomfort to the patient; that will extract saliva as it collects in the back portion of the patient's mouth and avoids the objectionable tissue drawing and discomfort from this result.

Another object of the invention is to provide a suction device wherein a suction nozzle portion of novel construction, is attached to the stem portion by means of a flexible, tubular connector that permits the nozzle to easily conform to or lie along the floor of the mouth and thus avoid any of the gouging or pressure discomfort of the rigid stem and to best adapt its position to the patient's position and withdraw saliva from the lowermost portion of the mouth.

Another object of the invention is to provide a device so constructed that its various parts may readily and easily be taken apart for cleaning and sterilizing.

Still another object of the invention is to provide a saliva ejecting device comprising a suction stem adapted to be hooked over the lower tooth ridge of the mouth and to which a suction nozzle is attached by means of a short length of flexible tubing that makes it possible for the nozzle

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to extend more to the back of the mouth and to lie in the most advantageous position for saliva ejection regardless of the tilt of the patient's head, and to rise and fall as the patient swallows or moves the floor of the mouth.

Still further objects of the invention reside in the details of construction of its various parts; in their combination and mode of operation, as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a side view of a saliva ejector embodied by the present invention.

Fig. 2 is an enlarged, longitudinal section of the suction nozzle that is applied to the inner end of the suction tube or stem portion of the device.

Fig. 3 is a cross section on line 3—3 in Fig. 2.

Fig. 4 is a perspective view of the parts of the nozzle, shown in a dis-assembled relationship for better understanding and explanation.

Fig. 5 is a sectional detail of the nozzle showing a closure cap of an alternative construction. Referring more in detail to the drawings—

The present device, in a form of construction now preferred, comprises a tubular metal stem 10 of a length suitable for its intended use, and suitably equipped at one end for convenient attachment to a suction hose, or the like, such as that indicated at 11 in Fig. 1, and curved at its other end as at 12 to hook form, for its intended application over the lower tooth ridge of the patient's mouth.

Applied over a reduced end portion 13 of tube 10, is the outer end portion of a short length of flexible rubber tubing 14, which, at its outer end, is connected with the present suction nozzle which, in Fig. 1, has been designated in its entirety by reference numeral 15. The use of the flexible tube 14 in this combination is one of the important features of the invention, as will presently be apparent.

Another important feature of the present invention resides in those details of construction of the nozzle that permits ample suction for saliva ejection and eliminates drawing the mouth tissues into the suction openings of the nozzle. These features are best understood by reference to Figs. 2 and 3, wherein it is noted that the outer end of the flexible tube 14 is applied tightly over the inner end of a nozzle tube 20. Surrounding the tube 20, and applicable thereover from either

end, is a tubular sleeve 25, the inner end of which is constricted, as at 26 in Fig. 2, to fit the tube 20.

Applied to the outer end of the nozzle is a round headed screw 27 having its shank or stem 27' threaded into the outer end of tube 20. The head of the screw is of approximately the same diameter as tube 25, and abuts flatly against the outer end of the latter. The inner face of the screw also is shouldered, as at 28, to receive the end of tube 25 thereover, and thus to be held axially centered relative to tube 20.

It is also shown that the screw has an axial bore 29 providing a direct passage for saliva into the tube 20 from the outer end of the nozzle. This bore is fed by the screw head slots.

In the assembled relationship of parts, the sleeve 25 is held in place against the screw head by the outer end of the rubber tube 14 as applied to the tube 20 and abutted tightly against the restricted end of the sleeve as noted in Figs. 1 and 2.

As an alternative closure for the outer end of the nozzle, I have provided a cap 40 with a cylindrical wall 41 that receives the outer end of the sleeve 25 therein. This cap is closed at its outer end and has a mounting shank 42 threaded into the tube 20. The shank has an axial bore 43 opening into the tube 20 and to the outer end of the nozzle.

This cap, being somewhat greater in diameter than sleeve 25, gives some protection to the slots 35 that eliminates tissue drawing.

In order that suction that is transmitted to the nozzle through the tubes 10, 11 and 14 may be utilized to effectively draw saliva into the nozzle, the tube 20 is formed at longitudinally spaced intervals in its outer end portion with suitable openings 32, here shown as transverse slits, but which might be openings of other shape. These are located in its opposite sides near the screw. Also, the sleeve 25 is provided along its outer end portion with a plurality of circumferentially spaced openings 35, in the form of elongated slots and in that end portion thereof that is next to the rubber tube 14, it is formed with a plurality of small ports 38, spaced circumferentially about the sleeve; these latter ports being for the purpose of admitting air to the sleeve to limit the degree of suction that may be applied to the annular chamber.

With the parts so arranged and assembled as shown, the device may be used as follows:

With the outer end of stem 10 connected to a suitable suction tube 11, the hook end of the stem is applied over the lower ridge in such manner that the nozzle will be permitted to lay along the floor of the mouth, extending inwardly. Suction created in the tube 10 by its connection to tube 11, will be transmitted to the nozzle tube 20 through the length of flexible tubing 14. This suction is transmitted through the tube 20 and through the openings 32 into the annular space within the tube 20 and sleeve 25. This will operate to draw saliva from the mouth through the passage 29 directly into the tube 20. Also, the suction created within the sleeve 25 through the slits 32 will operate to draw the saliva into the sleeve through the slots or openings 35 and thence through the openings 32 into the tube 20.

In the event that, in the intended use of the device, there should be any tendency toward tissue drawing through the slots 35, this suction will never become so strong as to cause any discomfort to the patient due to the fact that the open-

ings 38 will always admit air to limit the degree of suction and they will always be sufficiently away from the collected saliva, due to the manner of support of the nozzle, as to be unobstructed. Normally the saliva will be drawn into the sleeve through the openings 35 and what enters will be drawn from the sleeve into tube 20 through openings 32. The arrangement of the openings 35 about the sleeve insure that all will not be covered by tissues at any time, and therefore discomforting or damaging tissue drawing will be avoided.

The easy disassembly of parts that is permitted merely by unthreading the screw 27 from one end of the tube 20 and pulling the rubber tube 14 from its other end, makes it possible to easily clean and sterilize all parts effectively and easily.

The use of the short flexible tube 14 is not limited to this particular device or type of nozzle, and it will make it possible for any type of nozzle to readily assume the most practical and natural position in the mouth and without discomfort, regardless of whether the patient's head is tilted or not.

Proportions in size of parts may be varied to meet requirements and materials of any suitable kind may be employed in their construction.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is—

1. An ejector of the character described comprising a rigid stem portion designed to hook over the lower tooth ridge, a tubular suction nozzle designed to lie on the floor of the mouth for the withdrawal of saliva, and a flexible tubular member connecting the nozzle and inner end of the said stem that permits the nozzle to automatically adjust itself to its intended position in the mouth.

2. An ejector of the character described comprising a tubular stem adapted for connection at its outer end with a suction device and having its inner end portion designed to supportingly overlie the lower tooth ridge of the mouth, a flexible tubular extension applied to the inner end of the said stem and a suction nozzle at the end of said extension; said flexible extension permitting the nozzle to automatically adapt itself to a position free of pressure by the supported stem.

3. An ejector of the character described comprising a rigid tubular stem adapted for connection at its outer end to a suction device and having its inner end portion formed into hook shape to overlie the lower tooth ridge of the mouth, a flexible tubular extension member applied to the hooked end of the stem as a continuation thereof, and a suction nozzle at the end of said flexible extension and adapted to automatically adjust itself to lie on the floor of the mouth.

4. An ejector of the character described comprising a stem adapted for connection at its outer end with a suction device and having its inner end shaped to overlie the lower tooth ridge of the mouth, a short, flexible tubular extension applied to the inner end of said stem and a nozzle applied to the inner end of said flexible tube; said nozzle comprising an inner tubular member to which said flexible extension is applied, a sleeve enclosing said inner tubular member and forming an annular chamber between them; said sleeve having openings along its outer end portion for the intaking of saliva into said annular space, and having air ports in its inner end portion for the relief of suction; and said inner tube

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having openings therealong for the indrawing of the saliva therethrough from said annular space into the tube.

5. A device as in claim 4 wherein the said inner tubular member and sleeve are closed at their outer ends by a cap formed with an opening therethrough into said tubular member.

6. A device as in claim 4 wherein the said inner tubular member and sleeve are closed at their outer ends by a cap; said cap being slightly greater in diameter than the sleeve and said outer end openings of the sleeve being protected against closure by tissues by reason of said cap, and said

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cap having a central bore opening directly into the said inner tubular member.

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