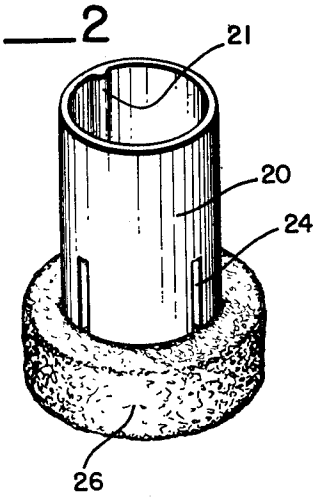
May 5, 1953 G. A. OTIS 2,637,106

SALIVA EJECTOR

Filed Nov. 13, 1951

FIG. 2



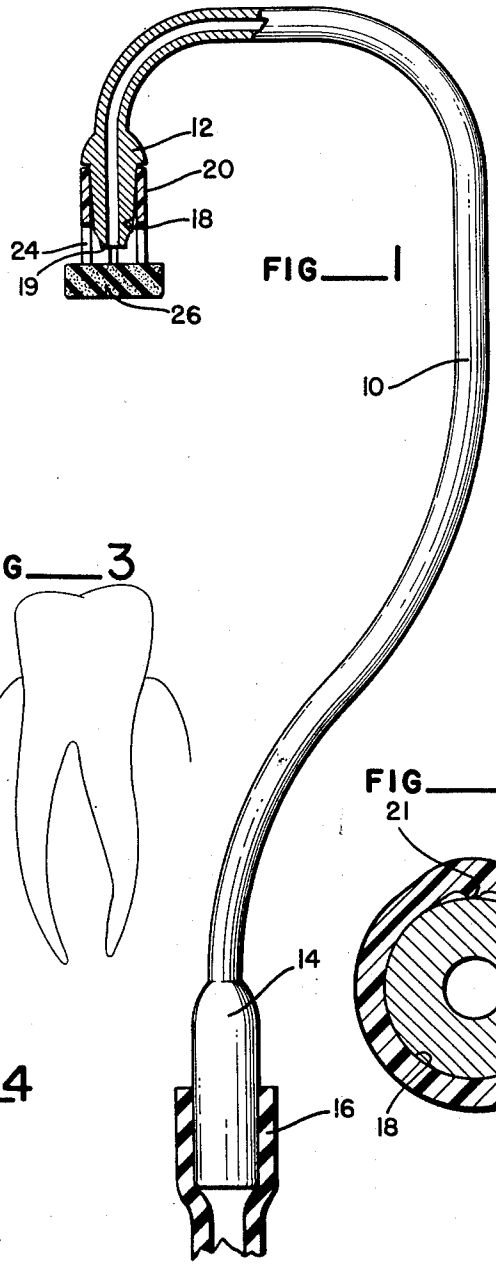


FIG. 1

FIG. 3

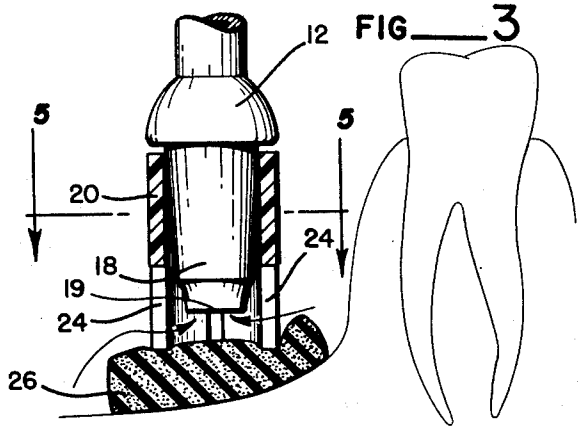
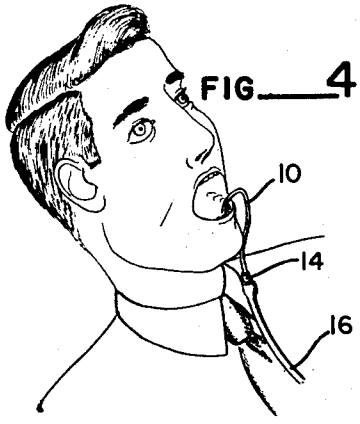


FIG. 5

FIG. 4



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SALIVA EJECTOR

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5 Claims. (Cl. 32—33)

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This present invention consists of a saliva ejector having a tubular portion formed similar to a question mark in general shape and employing, preferably, a separate tip element which supports the ejector as it rests against the flesh of the inner side of the oral cavity. The novelty of this present device consists, in part, in that the tip which bears against the tissues of the patient's mouth is small and can be made as a disposable unit or it can be removed from the ejector and individually sterilized if it is of a suitable structure. The end of the tip consists of a very resilient soft pad which fully protects the tissue of the mouth against any undue pressure point and the ingress openings into the ejector consist, preferably, of a plurality of slots through the lower end of the tube so narrow in their lateral extent that tissue from the patient's mouth will not be drawn into the same.

In the past a great inconvenience has been occasioned on the part of the dental patients by means of the usual saliva ejector. It is normally made of firm material, usually metal, and has an end that is slightly rounded with the idea of making it easier on the patient. However, the inner tissues of the patient's mouth are very tender and any solid tubular member, even though the weight imposed upon it is not very great, places this weight normally at one point of bearing so that the pressure for a unit area is relatively high. This soon creates a point of soreness which not only adds to the discomfiture of the patient but also adds to his dissatisfaction with the dental operation. Then, too, so many of the present observed ejector devices have either one large centrally disposed opening or a plurality of smaller round openings and the suction created by the siphoning action of the ejector tends to pull the delicate tissues of the inside of the mouth into some of these openings and as some of the openings are blocked, the full force of the suction device is then turned to the remaining openings to the end that the tissues are often so stretched or pinched that another item of real discomfiture is present. In my present tip for saliva ejectors it is believed I have overcome deficiencies of those ejectors that have been available for study and have provided a sanitary tip which well distributes the pressure of the device caused by the weight thereof over a relatively large area so that no sore spot will be developed, due to the weight of the ejector and the relatively long siphon tube connected thereto. Further, I provide ingress openings into the saliva ejector so arranged that experience has shown that it is impossible for the delicate tissues to be drawn into the narrow slots.

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The principal object of my present invention therefore is to provide a saliva ejector having a tip which cushions the bearing point of the ejector and distributes the load of the same over a sufficiently large area so that no local soreness will be developed by the continued use of the same.

A further object is to so shape the saliva ejector that the weight of the entire device, including the connecting tubing, bears evenly across the full face of the tip.

A further object of my invention is to provide a saliva ejector in which the ingress openings are so arranged and so proportioned that the delicate tissues of the patient's mouth cannot be drawn into the same or pinched thereby.

A further object of my invention is to provide a relatively inexpensive tip for saliva ejectors which can be easily sterilized apart from the ejector and thus one or more can be used on any one patient at a single sitting or the construction can be slightly modified, as to materials, so that the device can be made as a disposable unit which is used only once and then discarded.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

Figure 1 is an elevation view, partly in section showing a saliva ejector or siphon and showing the manner in which this present tip is employed with the same;

Figure 2 is a perspective view, on enlarged scale, showing my ejector tip;

Figure 3 is a vertical cross-sectional view showing the use of my tip as applied to the mouth area of a dental patient, with the gum and tooth structure indicated in light lines;

Figure 4 is a perspective view of the device in use in a patient's mouth;

Figure 5 is a cross-sectional view taken along the line 5—5 of Figure 3.

Referring more particularly to the disclosure in the drawings, the numeral 10 designates a saliva ejector. This is constructed of a metal tubular stem which is formed substantially in a question-mark manner, so that the suction end 12 is in substantial alignment with the discharge end 14, so that the rather long length of suction hose 16, which is normally secured to the enlarged end portion 14, will place an axial pressure on the discharge tip 12. With my improved

tip I have found it desirable to form the extreme end 12 with a tapered portion 18 so that my tip when applied to the ejector will come to rest in a secure friction joining which can easily be released when it is desirable to renew the tip as should certainly be with each new patient.

My tip which could be incorporated in stem 10, preferably, consists of a cylindrical tubular portion 20. This may be made of any suitable material such as plastic, metal, specially treated paper, and the like. Normally I prefer that the interior of tube 20 be cylindrical so as to engage the tapered portion 18 of the saliva ejector. By such an arrangement a ring of contact is normally provided between tube 20 and surface 18 and this permits considerable pressure to be applied, which insures a tight joint. A preferred construction is to provide tube 20 of material that is yieldable and to have a longitudinally extending rib 21 on the inner surface. This structure permits a slight distortion of tube 20, as shown in Figure 5, resulting in tangent portions in the tube wall and non-contacting portion of the inner wall on each side of rib 21. This form permits a tight seating of tube 20 yet enables the user to easily remove the tip at the end of a period of use. This latter requirement is essential in that a saliva ejector is a suction device in which negative pressure is applied to tube 16 normally by means of a water siphon and for the device to function, as intended, there must be a definite spacing of extreme end 19 of tube 12 above the upper surface of pad 26. At its lowermost end tube 20 is preferably serrated with a number of fine slots 24. Experience indicates that four is probably the minimum number of slots desirable and it will be noted, particularly in reference to Figure 4, that it is easily possible for the tip to rest against one wall of the mouth cavity and thereby possibly seal off all the slots on one side of tube 20. Therefore, a plurality of slots or an equivalent area in very small holes, extending entirely around the periphery of tube 20 is desirable. Attention is particularly invited to the advisability of having these slots quite narrow or the holes very small as, when they are so arranged, there is practically no possibility of the thin tissue of the inside of the mouth being drawn into the slots, which so often occurs with the old style of saliva ejector and particularly those that use relatively large round holes in a screen effect. Such an action is very annoying and painful to a patient. It is further desirable that slots 24 extend up from the bottom of tube 20 a relatively short distance so that as the saliva collects in the mouth it will normally tend to cover the slots and thus avoid drawing in air and permit the fullest possible negative pressure for use in breaking the surface tension aggravated by the narrow openings and permit the saliva to be drawn into the suction tube 10.

To overcome one of the present faults and inconveniences of ejectors, I have provided, secured to the lowermost portion of tube 20, a soft, resilient pad. No doubt many forms of material would be useful in this position but rubber has been used with good success and any other material that would have the same general characteristics to sponge rubber as to softness and resilience would also serve. In my present preferred form, using a plastic cylinder 20, it is relatively simple to cement sponge rubber or the expanded cellulose products to the bottom margin of tube 20. Other means of attaching the resilient pad to the tube will no doubt be well known to persons in this line of endeavor. It is desirable, however, that the pad 26 be of sufficient thickness to form a good cushion after the showing of Figure 3, and it should further be of a diameter considerably larger than that of tube 20, as will be noted in the proportions shown throughout the drawings. This insures that at all times the bottom margin of tubes 20 will be protected and that the slots will be held away from the tissue in the patient's mouth by the enlarged diameter pad.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of a saliva ejector.

Having thus disclosed the invention, I claim:

1. A saliva ejector, comprising: a metal tube having a discharge end adapted for attachment of a suction tube thereto and having a suction end, said tube having a question-mark like shape with said discharge and suction ends substantially axially aligned; said suction end being tapered; a removable discharge tip positioned on said tapered suction end, said discharge tip having a hollow, substantially cylindrical form, said discharge tip having a longitudinal rib on its inner surface and being formed of material having resilient properties so that said tip may be distorted in the area of contact between said rib and said tapered suction end for securing said tip thereon; a disc-like pad of very resilient, sponge-like material positioned on an end of said discharge tip, said pad having a diameter larger than the diameter of said tip; said discharge tip having a series of longitudinal slots of very narrow width extending from adjacent said pad and arranged radially about the axis of said tip.

2. A saliva ejector, comprising: a tube having a discharge end and a suction end, said suction end being tapered; a removable discharge tip positioned on said tapered suction end, said discharge tip having a hollow, substantially cylindrical form, said discharge tip having a longitudinal rib on its inner surface and being formed of material having resilient properties so that said tip may be distorted in the area of contact between said rib and said tapered suction end for securing said tip thereon; a disc-like pad of very resilient material positioned on an end of said discharge tip, said pad having a diameter larger than the diameter of said tip; said discharge tip having a series of longitudinal slots of very narrow width extending from adjacent said pad to a short distance past the end surface of said suction end, said slots being disposed radially about the axis of said tip.

3. A saliva ejector, comprising: a tube having a discharge end and a suction end, said suction end being tapered; a removable discharge tip positioned on said tapered suction end, said discharge tip having a hollow, substantially cylindrical form; a disc-like pad of very resilient, sponge-like material positioned on an end of said discharge tip; said discharge tip having a series of longitudinal slots of very narrow width extending from adjacent said pad to a short distance past the end surface of said suction end, said slots being disposed radially about the axis of said tip.

4. A saliva ejector, comprising: a tube having a discharge end and a suction end, said tube making substantially a return bend between said discharge and suction ends and said suc-

tion end portion depending vertically from the adjacent portion of said tube, said discharge and suction ends being substantially axially aligned whereby said tube has a question-mark like shape, a removable discharge tip positioned on said suction end, said discharge tip having a tubular form, a disc like pad fixedly secured to and covering the bottom edge of said discharge tip formed of material having the characteristics of sponge rubber in being soft, non-fibrous, elastic and honeycombed with air cells, and said discharge tip having a plurality of slots of very narrow width in its sidewalls.

5. A saliva ejector, comprising: a tube having a discharge end and a suction end, said tube making substantially a return bend between said discharge and suction ends and said suction end portion depending vertically from the adjacent portion of said tube, a removable discharge tip positioned on said suction end, said discharge

tip having a tubular form, a disc like pad of larger diameter than said discharge tip fixedly secured to and covering the bottom edge of said discharge tip, said pad being formed of material having the characteristics of sponge rubber in being soft, non-fibrous, elastic and honeycombed with air cells, and said discharge tip having a plurality of slots of very narrow width in its sidewalls.

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