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DENTAL SALIVA EJECTORS
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FIG. 1.

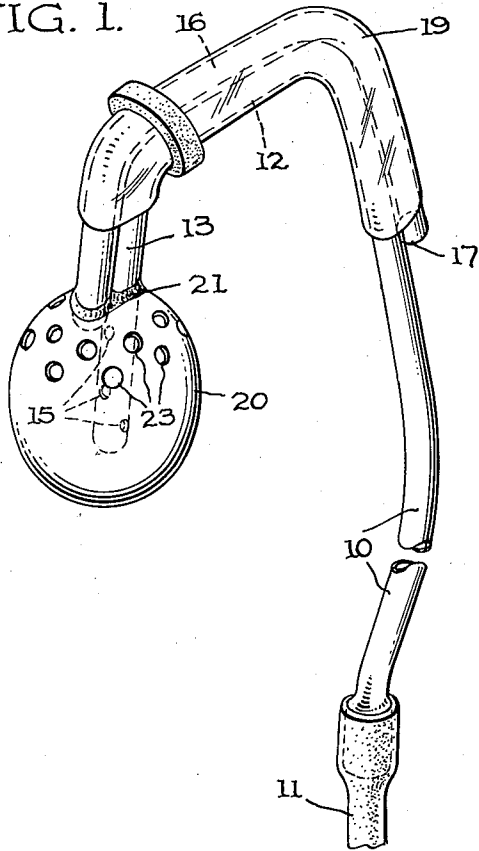


FIG. 2.

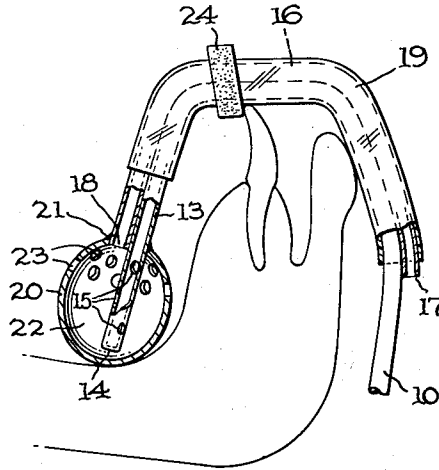


FIG. 3.

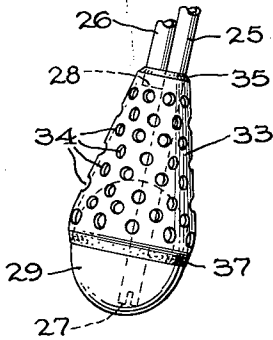
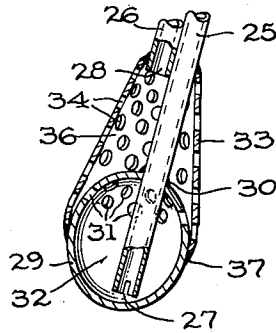


FIG. 4.



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DENTAL SALIVA EJECTORS

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2 Claims. (Cl. 32-33)

This invention relates to improvements in dental saliva ejectors.

An object of the invention is to provide a dental saliva ejector which is non-clogging, highly efficient in operation, comfortable for the patient and ideally suited for use during the performance of a dental prophylaxis and various other dental operations.

A further object is to provide a saliva ejector having novel and simplified suction relief means which comes automatically into operation to relieve the suction pressure in the main suction chamber if the suction orifices should ever become blocked or clogged by the tongue, mouth tissue, pumice or the like.

Another object is to provide a dental saliva ejector which is adjustable with respect to the lower incisor teeth in a novel and simplified manner.

Still another object is to provide a saliva ejector whose design is based upon sound air flow or air dynamics principles, thereby rendering the device highly efficient in operation and non-clogging.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 is a perspective view of a dental saliva ejector according to one preferred embodiment of the invention.

FIGURE 2 is a fragmentary side elevation of the same during use, partly in section,

FIGURE 3 is a fragmentary side elevation of a modified form of the invention,

FIGURE 4 is a central vertical cross section through the device shown in FIGURE 3.

In the drawings, wherein for the purpose of illustration are shown preferred embodiments of the invention, attention is directed first to FIGURES 1 and 2, wherein the numeral 10 designates a main preferably metallic main suction tube adapted for connection at its lower end with a flexible hose 11 leading to a convenient source of vacuum, not shown. The main suction tube 10 is formed to provide an upper hook-like portion 12 integral therewith, carrying a depending generally vertical straight terminal extension 13 disposed inside of the mouth during use, FIGURE 2. The extension 13 extends close to the floor of the mouth during use and has its lower end closed as indicated at 14. Preferably three small suction orifices 15 are formed through the lower portion of tube extension 13 in longitudinally equidistantly spaced relation and these orifices are preferably spaced apart or staggered equidistantly circumferentially of the tube extension 13 to increase the efficiency of the device. The lowermost orifice 15 is near and slightly above the closed tube end wall 14, as shown.

An auxiliary or suction relief tube 16 parallels the hook-like portion 12 of the main suction tube and has a first open end 17 disposed entirely outside of the mouth during use and a second open end 18 terminating within the mouth during use and spaced just above the uppermost suction orifice 15. The suction relief tube 16 is fixedly secured upon the main suction tube 10 by welding, soldering or the like and forms an integral part of the saliva ejector.

The hook-like portion 12 and the major portion of the suction relief tube 16 are covered and enclosed by a suit-

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able resilient plastics sheath 19 which may be applied thereto as a coating or formed separately as a sleeve and applied over the tubes 10 and 16. The sheath or covering 19 protects the lower incisor teeth and in fact all of the teeth from direct contact with the metallic tubes 10 and 16, and therefore enhances the comfort of the patient considerably.

An approximately spherical hollow ball or enclosure 20 is provided upon the mouth engaging end of the device as shown in the drawings. The ball 20 has opening means in its top to receive the tube extension 13 and the adjacent end 18 of the suction relief tube. These elements are firmly anchored by welding, soldering or the like, as at 21 within the opening means at the top of the ball 20 and in a fluid tight manner. The open end 18 of suction relief tube 16 communicates directly with the interior suction chamber 22 provided by the ball 20 and the suction relief tube terminates at the top of the ball, as shown. The ball 20 surrounds and encloses the lower portion of tube section 13 having the suction orifices 15, and all three of the orifices 15 are within the ball and communicate directly with the ball suction chamber 22. The ball 20 is rigid with the main suction tube and the suction relief tube and permanently assembled thereto during manufacturing. The lower end 14 of tube extension 13 is spaced slightly from the bottom of the hollow ball 20.

The major portion of the hollow ball 20 is imperforate, and this includes the entire lower half of the ball and a considerable region above its center. The upper portion of the hollow ball is provided with preferably two circumferential rows of small suction or saliva openings 23, the openings in each row being numerous and spaced apart equidistantly and the openings in the two rows being preferably staggered circumferentially as shown. The multiple openings 30 in the upper ball portion provide open access for the saliva to enter the interior suction chamber 22 during the operation of the device.

An adjusting ring 24 formed of plastics material, rubber or the like is slidably mounted upon the plastics sheet 19 and adapted to engage the lingual surfaces of the lower incisor teeth, FIGURE 2, to permit convenient adjusting of the saliva ejector within the mouth and relative to the floor of the mouth. During use, the bottom of the ball 20 should be upon or close to the floor of the mouth for effective operation.

In operation, the device is positioned in the mouth approximately as shown in FIGURE 2 and the ring 24 is adjusted to suit the needs of a particular patient. Suction is applied through the hose 11 to the main suction tube 10.

When the saliva in the mouth accumulates or puddles around the ball 20 up to the level of the openings 23, it will be drawn through these openings and into the suction chamber 22 and from this chamber through the suction orifices 15 and through the main suction tube for conveyance outside of the mouth. Since the openings 23 are located in the upper portion of the relatively large ball 20, there is no tendency for the soft tissue lining the floor of the mouth to be drawn by suction into uncomfortable or clogging engagement with the openings 23, and this constitutes an important feature of the invention. The ball 20 is lightweight and rests lightly and comfortably upon the floor of the mouth and the saliva is continuously removed in an efficient manner without the slightest discomfort to the patient.

Should all of the openings 23 become blocked by the tongue and/or mouth tissue or with pumice or other foreign matter, the suction relief tube 16 immediately and automatically relieves the vacuum in the chamber 22 before this vacuum increases beyond a desired extent, which might cause damage to the mouth tissue and discomfort

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to the patient. The suction in the chamber 22 will always be relieved or vented through the tube 16 when any unusual circumstances block the openings 23. Since the open end 17 of the suction relief tube extends fully outside of the mouth, the operation of the relief tube is not obstructed by the lips, tongue or the like under any circumstances.

In FIGURES 3 and 4, there is shown a slight modification of the invention wherein the depending mouth engaging extension of the main suction tube is indicated at 25 and the terminal end portion of the suction relief tube is shown at 26. The lower end of the tube extension 25 in this embodiment is fully open and preferably slotted diametrically as at 27. The lower end 28 of the suction relief tube is also entirely open. The main suction and suction relief tubes in FIGURES 3 and 4 are secured together in the same manner previously described in connection with FIGURES 1 and 2 and are preferably provided with the same plastics covering 19 and depth adjusting ring 24 also shown and described previously. These elements are omitted in FIGURES 3 and 4 for the purpose of simplification but the general construction is the same as that shown in the previous embodiment.

With continued reference to FIGURES 3 and 4, the lower portion of generally vertical tube extension 25 is enclosed within and surrounded by a hollow approximately spherical enlarged ball 29 having an upper opening 30 receiving the tube extension 25 and secured thereto fixedly and in a fluid tight manner by welding or the like. The lower open end of tube extension 25 is spaced slightly above the bottom wall of the ball 29, as shown. The ball 29 is preferably imperforate except for a circumferential row of equidistantly spaced small orifices 31 which are formed therethrough near and above the center of the ball and about midway of the length of the portion of tube extension 25 which is enclosed by the ball. The ball 29 provides a relatively large suction chamber 32 surrounding the lower part of tube extension 25 and communicating directly with the slot 27 and the bottom open end of the main suction tube.

An upwardly conically tapered perforated sleeve 33 having a multiplicity of uniformly spaced small perforations 34 is provided in surrounding relation to the ball 29, tube extension 25 and the terminal portion 26 of the suction relief tube, as shown. The upper end of the perforated sleeve 33 is secured in a fluid tight manner as at 35 by welding or the like around the tube portions 25 and 26 and with the open end 28 of the suction relief tube just below the closed top of sleeve 33 in direct communication with the interior thereof. Tube section 25 extends axially through the interior of the tapered sleeve 33, as shown, in somewhat eccentric relation thereto, and the sleeve provides an upper suction chamber 36 above the ball 29 and communicating with the open tube end 28 and with the openings 31 of the ball 29. The tube extension 25 is closed or imperforate and has only its lower end open within the ball 29 as previously stated. The lower flared end of the perforated sleeve 33 is secured in a fluid tight manner at 37 by welding or the like to the periphery of the ball 29 just below the center of the ball and below the row of openings 31, so that the latter are not obstructed by the sleeve and do communicate with the outer perforations 34 and the upper chamber 36.

The operation of the device is broadly the same as described above in connection with the first form of the invention. With suction applied to the main suction tube

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including the extension 25, the saliva is drawn through the perforations 34 and into the upper chamber 36 and then through the openings 31 of the ball and into the suction chamber 32 and from this chamber into the lower open and slotted end of suction tube extension 25. The suction relief tube 26 relieves the vacuum in the chamber 36 and in the chamber 32 automatically if all of the perforations 34 should ever be plugged or covered in any manner. The construction is such that the saliva ejector is substantially non-clogging and cannot damage the mouth tissue or cause the patient any discomfort. When used, for example, while giving a dental prophylaxis, the device will draw off all of the saliva, water and pumice slurry in a continuous manner so that the dentist need not be interrupted at intervals to allow the patient to expectorate, as is the common practice with the less efficient prior art devices presently in use. The saliva ejector is light in construction and comfortable in the mouth and free of all sharp edges or corners which could cause discomfort. It is sturdy and durable in construction and its design is such that it has the maximum practical capacity for removing saliva and the like from the mouth.

It is to be understood that the forms of the invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A dental saliva ejector comprising a suction tube portion engageable within the mouth and having a lower open end, an enlarged hollow rigid ball element surrounding and enclosing the lower terminal part of the suction tube portion and secured thereto and having its bottom spaced somewhat below said lower open end and having a circumferential row of spaced suction orifices formed through its side wall near the center thereof, a suction relief tube associated with the suction tube portion and having an open end terminating above the top of the ball element and substantially above the lower open end of the suction tube portion, and a perforated upwardly conically tapering rigid sleeve surrounding the suction tube portion and suction relief tube and ball element and having fluid tight engagement therewith and defining a chamber in direct communication with the suction relief tube and said suction orifices of the ball element.

2. A dental saliva ejector according to claim 1, and wherein said perforated sleeve has its upper end disposed just above the lower open end of the suction relief tube and its lower end disposed somewhat below said circumferential row of suction orifices and near the center of the hollow ball element.

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