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3,091,859

DENTAL SALIVA EJECTORS

Filed July 19, 1961

FIG. 1.

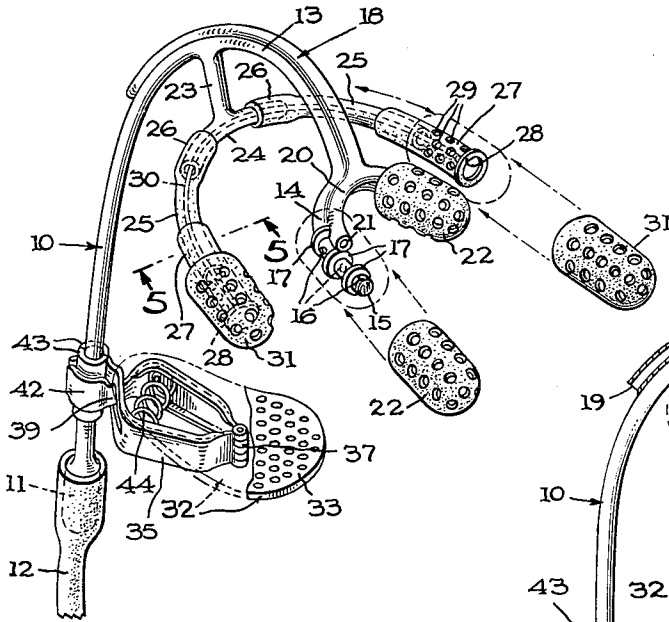


FIG. 5.



FIG. 2.

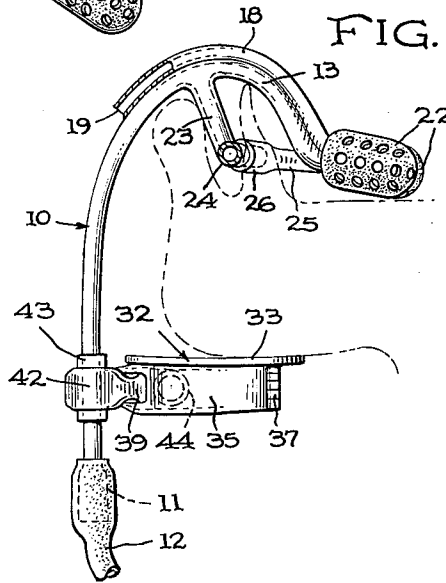


FIG. 3.

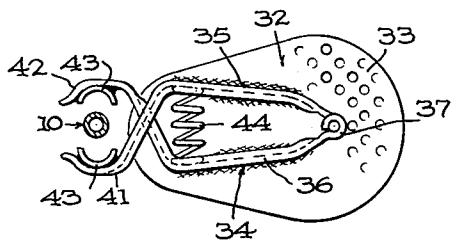
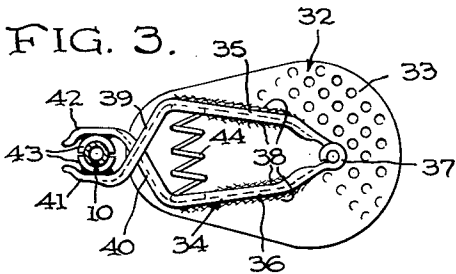
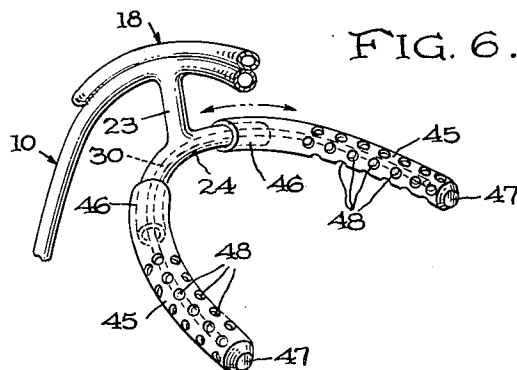


FIG. 4.

FIG. 6.



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DENTAL SALIVA EJECTORS

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3 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 highly efficient in removing saliva and water from the floor of the mouth and also from the buccal and labial cheek folds, thereby materially aiding the dentist during air turbine drilling operations and the like.

A further object of the invention is to provide a saliva ejector including novel and simplified adjusting means to assure a proper fit of the instrument within the mouths of various patients.

Another object is to provide a novel and improved and readily adjustable chin plate for saliva ejectors, rendering the same more efficient during use and making it unnecessary to continually hold the saliva ejector with the hand when the same is in the mouth of the patient.

Other objects and advantages of the invention will be apparent during the course of the following detailed 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, partly exploded, of a dental saliva ejector embodying the improvements according to the present invention,

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

FIGURE 3 is a bottom plan view, partly in section, and with parts omitted,

FIGURE 4 is a similar view showing the clamp of the chin plate in the open or released position,

FIGURE 5 is an enlarged fragmentary cross section taken on line 5-5 of FIGURE 1,

FIGURE 6 is a fragmentary perspective view, partly in section, illustrating a modification of the invention.

In the drawings, wherein for the purpose of illustration are shown preferred embodiments of the invention, attention is directed first to FIGURES 1 through 5, wherein the numeral 10 designates a main, preferably metallic, suction tube having one end adapted for connection at 11 with a flexible suction hose 12, leading to a suitable source of vacuum, not shown. The main suction tube 10 has an upper curved integral hook-like extension 13, engageable over the lower incisor teeth during use and adapted to extend inside of the mouth and adjacent to the floor of the mouth. The lower end of hook-like extension 13 carries an integral generally U-shaped bifurcated tubular extension 14, disposed substantially horizontally during use adjacent the floor of the mouth, on the lingual side of the lower gum. The U-shaped extension 14 has its terminal ends 15 closed and is provided upon each side with preferably three small suction orifices 16, spaced apart longitudinally on the extension 14 and staggered circumferentially thereof, so that each adjacent pair of the orifices 16 are spaced about 90 degrees apart circumferentially. The opposite sides or arms of the U-shaped extension 14 are preferably provided adjacent to the orifices 16 with ring-like enlargements 17, integral therewith, and separating the suction orifices 16, as shown in FIGURE 1.

Paralleling the hook-like extension 13 of main suction tube 10 and secured rigidly thereto by welding, soldering or the like, is a curved suction relief tube 18 having an outer open end 19 disposed outside of the mouth during

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the use of the instrument. The inner end of suction relief tube 18 is bifurcated at 20 and disposed upon the U-shaped main suction tube portion 14 in parallel relation thereto as shown. The terminal ends 21 of suction relief tube portion 20 are open and terminate adjacent to the intermediate ring-like enlargement 17, just above the latter. Perforated substantially cylindrical rubber tip elements 22 engage detachably over the arms or sides of the U-shaped tube portions 14 and 20, and in assembly, cover the several ring-like enlargements 17 and the open ends 21 of tube portion 20 as shown in the drawings.

The saliva ejector further comprises a short depending tube section 23, connected in the hook-like tube portion 13 near the center of the latter and in direct communication therewith. The lower end of tube extension 23 carries an integral arcuate substantially horizontal tube section 24 which generally parallels the U-shaped tube portions 14 and 20 and is disposed forwardly thereof, as shown. Flexible tube sections 25 of rubber, plastics material or the like, engage telescopically at 26 over the end portions of arcuate tube sections 24 and extend for substantial distances beyond the ends of the latter. Additional tube sections 27 of plastics material or the like engage telescopically and adjustably over the tube sections 25 and extend beyond the ends of the same and have integral annular end flanges 28 and a multiplicity of perforations 29 inwardly of these flanges, as shown. The tube sections 25 and 27 are semi-flexible or bendable and the tube sections 27 are longitudinally adjustable by sliding upon the tube sections 25, so that the overall length of the U-shaped unit embodying the tube sections 25 and 27 may be varied to meet the needs of individual patients.

To aid in shaping or contouring the tube sections 25 and 27 and to maintain the latter in the desired position after adjustment and contouring, a wire element 30 of malleable material such as silver is disposed within and extends through the several tube sections 24, 25 and 27, with its opposite ends terminating preferably somewhat inwardly of the end flanges 28 as shown in FIGURE 1. By virtue of the presence of the wire element 30, the flexible tube sections 25 and 27 upon each side of the metallic tube section 24 may be shaped or contoured to fit the mouth of a particular patient, and after shaping, will remain in the desired position due to the stabilizing effect of the malleable wire element 30. Perforated rubber tip elements 31 substantially identical to the elements 22 are detachably engageable over the perforated areas of adjustable tube sections 27, as shown.

The saliva ejector embodies a convenient and readily adjustable chin plate unit 32, including a generally flat somewhat pear-shaped perforated plate 33, adapted to engage beneath the chin of the patient as shown in FIGURE 2. Mounted upon the lower side of the plate 33 is a resilient clamp 34 having companion arms 35 and 36, hinged together at 37, and the former of which arms is fixedly secured to the bottom of the plate 33 as at 38 by welding, soldering or the like. The opposite arm 36 is freely swingable across the bottom face of the plate 33 and toward and from the arm 35 during the operation of the clamp 34.

The chin plate clamp 34 has forward crossing arm portions 39 and 40, terminating forwardly of the plate 33 in jaw extensions 41 and 42, carrying upon their inner faces a pair of opposed semi-cylindrical jaws 43, adapted to snugly embrace main suction tube 10 frictionally. A rather strong compressible coil spring 44 between the arms 35 and 36 biases the jaws 43 toward closing or gripping engagement with the main suction tube 10, FIGURE 3. The entire chin plate assembly or unit 32 is readily detachable from the saliva ejector by opening the clamp 34 in the manner shown in FIGURE 4. If preferred, the

saliva ejector may be utilized without the chin plate unit 32 and the same is therefore an optional feature of the invention. As should now be obvious, the chin plate unit 32 is readily adjustable lengthwise of the main suction tube 10 so that the saliva ejector may be clamped within the mouth of various patients in a comfortable manner and in a position to suit the needs of the patient and the dentist.

The operation or use of the instrument in connection with individual patients is as follows:

The opposite sides or arms embodying tube sections 25 and 27 are adjusted telescopically to proper length and then shaped or contoured to fit the particular patient in the manner previously described. The instrument is then placed in the patient's mouth and the chin plate unit 32, when employed, is adjusted by the dentist and serves to hold the instrument in the desired position and in a manner which will be comfortable to the patient, without necessitating constant holding of the saliva ejector with the hand and constant adjustment of the same. The unit 32 is highly compact and easy to manipulate by merely operating the pinch clamp 34 with the fingers, and once adjusted, the chin plate unit will remain in the desired position upon the main suction tube 10.

With particular reference to FIGURE 2, the innermost rubber tips 22, tube portions 14 and 20 and associated elements, are disposed during use upon or near the floor of the mouth, inwardly of or on the lingual side of the lower gum and teeth. The arms embodying tube sections 25 and 27 are, as previously stated, for the purpose of removing saliva and water from the buccal and labial cheek folds, and therefore these arms during use extend about the buccal sides of the lower gums or between the lower gum and the cheeks.

When suction is applied to the main tube 10 through the hose 12, all saliva and water on the floor of the mouth and in the cheek folds is efficiently withdrawn by passing through the perforations of the rubber tips 22 and 31 and then through the suction orifices 16 and the apertures 29 and finally through tube sections 14, 25 and 24 and into the main suction tube 10. The suction relief tube 18 assures that excessive or undesirable suction will never be developed inside of the tips 22, and when the suction pressure exceeds a desirable amount within the tips 22, such suction is immediately relieved through the relief tube 18 which extends outside of the mouth, as shown.

In FIGURE 6, there is shown a slight modification of the invention wherein all parts of the saliva ejector are identical to those previously described in FIGURES 1 through 5, with the exception of the arms which extend into the buccal and labial cheek folds.

With reference to FIGURE 6, fragmentary portions of the main suction tube 10 and the suction relief tube 18 are shown, and the previously described depending tube extension 23 is shown, together with the previously described arcuate tube portion 24. The chin plate unit 32 has been omitted in FIGURE 6 to avoid unnecessary repetition in the drawings, and all of the other elements such as tube portions 14 and 20 and associated parts shown in FIGURE 1 have also been omitted in FIGURE 6 for the same purpose.

In FIGURE 6, instead of the previously described flexible tube sections 25 and 27 and the rubber tips 31, there is provided a single pair only of elongated relatively slender flexible tube sections 45 formed of rubber, plastics material or the like, and having corresponding ends engaging telescopically at 46 over the ends of the tube section 24. The opposite ends 47 of tube sections 45 are closed, and the slender tube sections 45 are perforated at a multiplicity of points as at 48 between their closed ends 47 and the terminal ends of rigid tube section 24. The malleable wire section 30 or a substantially identical

wire section is employed within the tube section 24 and the extension tube sections 45 in FIGURE 6, to facilitate shaping or contouring of the latter in substantially the manner described above in connection with the prior form of the invention. All other parts not shown in FIGURE 6 are identical with the corresponding parts shown and described in the prior form of the invention.

The use or operation of the saliva ejector shown in FIGURE 6 is substantially identical to the first form of the invention, the only difference residing in the construction of the arms or extensions which are disposed during use in the buccal and labial cheek folds. The arrangement shown in FIGURE 6 is more compact than that shown in FIGURE 1 and both forms of the invention perform with efficiency for removing saliva and water from the cheek folds.

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 scope of the subjoined claims.

Having thus described my invention, I claim:

1. A dental saliva ejector comprising a main suction tube adapted for connection with a source of vacuum, said main suction tube having a hook-like portion engageable over the lower incisor teeth and including an arcuate tube extension at the terminal end of said hook-like portion, said arcuate tube extension having closed ends and adapted to rest on the floor of the mouth on the lingual side of the lower gum during use, portions of said arcuate tube extension defining spaced suction orifices inwardly of the closed ends thereof, a suction relief tube fixed on said main suction tube and said arcuate tube extension in generally superposed relation thereto, said suction relief tube terminating at one end outwardly of the mouth when the ejector is in an operative position and at the opposite end adjacent the ends of said arcuate tube extension, an arcuate substantially horizontal tube section in communication with said main suction tube and in a plane generally parallel to the plane of said arcuate tube extension, first flexible tube sections telescopically engaged over opposite ends of said horizontal tube section, second flexible tube sections telescopically slidable on said first flexible tube sections and having portions thereof defining a plurality of perforations therein, a malleable wire element disposed within said horizontal tube section and said first and second flexible tubes whereby said flexible tubes can be flexed and held to conform to the mouth in the buccal and labial cheek folds, and an adjustable chin plate removably carried by the main suction tube.

2. A dental saliva ejector as defined in claim 1 wherein said arcuate tube extension includes spaced ring-like enlargements inwardly of the closed ends thereof, said suction orifices being between said ring-like enlargements, and perforate generally cylindrical tip elements detachably engaged over said ring-like elements on said arcuate tube extension.

3. A dental saliva ejector as defined in claim 1 which further includes perforate generally cylindrical tip elements detachably engaged over the portions of said second flexible tube sections having the plurality of perforations therein.

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