June 6, 1939. H. FREEDMAN 2,161,151

SALIVA EJECTOR

Filed Jan. 25, 1937

Fig. 1.

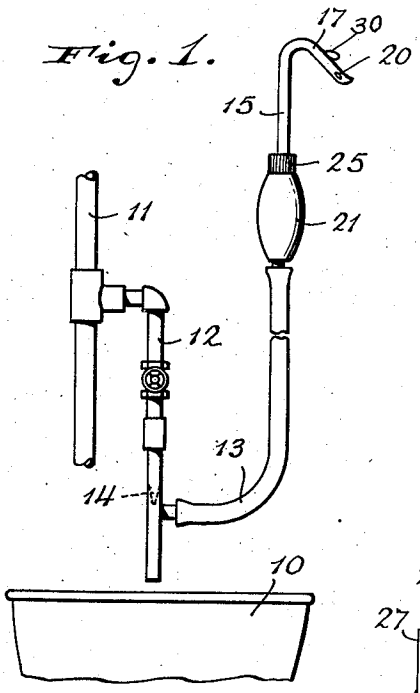


Fig. 2.

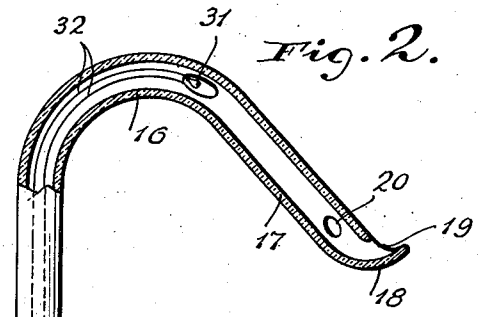
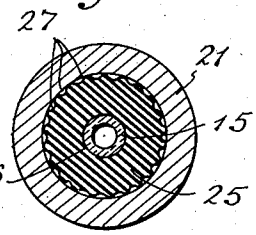


Fig. 3.



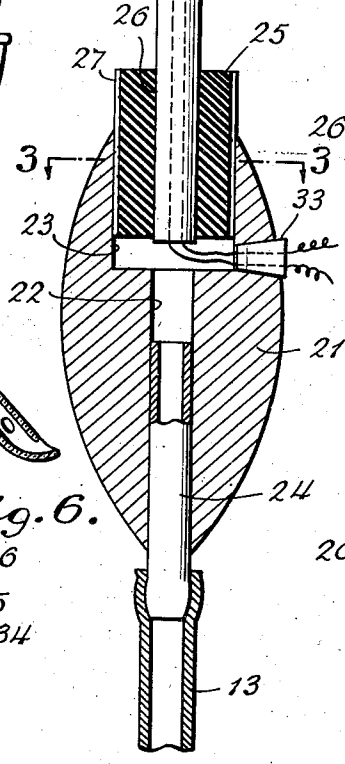


Fig. 4.

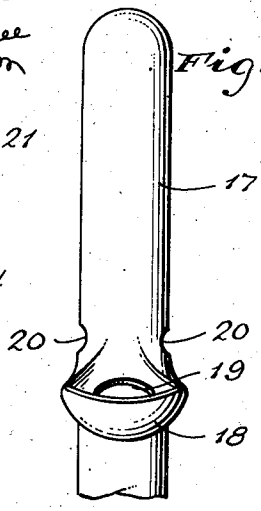


Fig. 5.

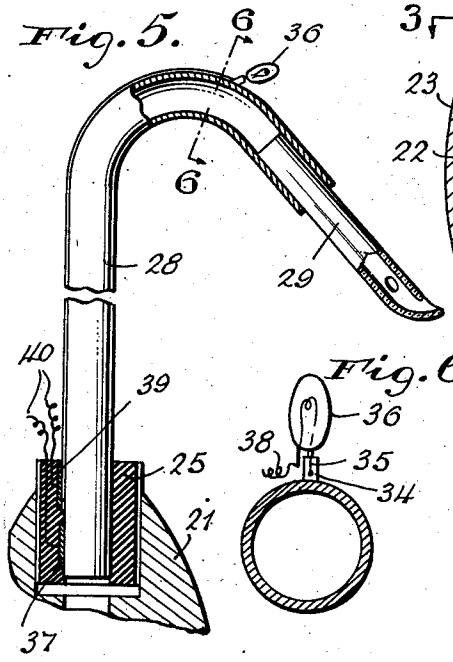


Fig. 6.

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SALIVA EJECTOR

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2 Claims. (Cl. 32—33)

This invention relates to improvements in dental appliances and has particular reference to a saliva ejector.

When ejectors are used during the course of dental work, it has been a common experience to have the patient seek, with his tongue, to close the opening or openings in the mouthpiece of an ejector through which saliva is ejected by a suction created in said mouthpiece. To avoid this contingency, which sometimes results in the extraction of the serum of the blood from the tissues of the mouth due to the increase in the vacuum created in the tube by the closure of said openings, it has been the practice heretofore to close the end of the mouthpiece where the patient can most conveniently place his tongue to stop the suction, and to form openings in the wall of the mouthpiece at points slightly removed from said end where they are intended to be less accessible to the tongue. However, it has been found that these latter openings are not entirely effective in the prevention of stoppage of the suction action and, as a consequence, resort has been had to the formation of an auxiliary or relief opening the elbow of the instrument located outside of the patient's mouth and through which air continues to be drawn into the tube should the saliva openings be closed, thus tending to avoid an increase of vacuum in the tube which might prove harmful to the tissues of the mouth. A drawback to such a construction resides in the fact that, with the extremity of the mouthpiece permanently closed and the saliva discharge openings located at a point spaced from said extremity, a well or chamber is formed in the end of the mouthpiece in which sediment will accumulate that is difficult to remove when cleaning the instrument with the usual wire brush cleaners that are employed for the purpose, since these cleaners can not be passed entirely through the tube.

An object of the present invention is to overcome the above-noted difficulties by providing an improved construction which will effectively prevent the possibility of injury to the tissues of the mouth and permit of a thorough cleansing of the instrument. In carrying out said object, the mouthpiece is open at both extremities so that a cleaner can be readily passed entirely through the tube and worked back and forth to effectively remove any accumulated sediment, and further openings are formed in the wall of the tube adjacent the mouth end thereof.

Another object is to connect the mouthpiece to a means for creating suction therein, by a coupling in which two members cooperate to provide for the admission of atmospheric air into the mouthpiece in the event the various openings in the mouth end thereof should all become closed during use of the instrument.

A further object is to provide an improved ejector of simple and practical construction wherein the same may carry a source of light which will be effective in illuminating a patient's mouth when the instrument is in use.

The above and other objects will appear more clearly from the following detailed description when taken in connection with the accompanying drawing which illustrates preferred embodiments of the inventive idea.

In the drawing:

Figure 1 is a side elevation of an ejector constructed in accordance with the present invention, showing the same connected to a standard form of cuspidor appliance.

Figure 2 is an enlarged elevation, partly broken away and shown in section, of an ejector and connecting means therefor.

Figure 3 is a transverse section on the line 3—3 of Figure 2.

Figure 4 is a front elevation of the mouthpiece of the ejector.

Figure 5 is a view similar to Figure 2 showing a slightly different form of ejector and connecting means, and

Figure 6 is a section on the line 6—6 of Figure 5.

Referring particularly to Figure 1, the numeral 10 indicates the usual type of dental cuspidor to which water is supplied from a pipe 11 having a valved connection 12 for the controlled discharge of water into the cuspidor 10. For purposes of use with a saliva ejector in order to create a suction and consequent partial vacuum in the usual flexible tube 13 to which the ejector is connected, the pipe 12 is provided adjacent the point of attachment of the tube 13 therewith, a restricted nozzle 14 which projects the stream of water entering the pipe 12 across the opening to which the tube 13 is joined so as to create the desired suction in said tube and thereby extract saliva from the mouth when the ejector is in use.

The ejector, in accordance with the present invention and as shown in Figures 1 and 2, comprises the discharge tube 15, usually made of glass, the intermediate portion of which is bent to provide the elbow 16 from which extends obliquely the mouthpiece 17. The free end of the latter is curved as indicated at 18 to form a lip which will rest conveniently within the well of the mouth and at its free extremity said

mouthpiece is provided with a discharge opening 19 in substantial alignment with the bore of the tube and so situated as to be conveniently closed by the patient's tongue if he seeks to close the same as is unconsciously done by many patients. This disposition of the opening is contrary to the usual practice in which the extremity of the mouthpiece is closed at this point and the mouthpiece provided with openings spaced a slight distance from the end where the saliva can still be discharged but where the patient has more difficulty in closing the openings with the tongue. However, it has been found that with this usual type of construction the patients are often successful in closing these side wall openings notwithstanding their comparative inaccessibility. To overcome this condition, the present invention proposes the use of additional openings 20, such as heretofore used, located in opposed relation in the wall of the mouthpiece so as to operate in conjunction with the opening 19. The arrangement of said openings 19, 20 is such that should the opening 19 be closed by the tongue, it is virtually impossible for the patient at the same time to also close the opening 20 and thus the suction will at all times be maintained.

A novel means is provided for detachably connecting the end of the tube 15 remote from the mouthpiece to the tube 13. This connection is in the form of a coupling consisting of an outer member 21, which may be of hard rubber and in the form of a handle by means of which the apparatus may be manipulated, and said member is provided with an opening 22 extending therethrough one end of which terminates in an enlarged recess 23. The opposite end of the opening 22 is adapted to receive a rigid tube 24 to which the flexible hose 13 may be connected and which may be withdrawn from the member 21 in disassembling the device. A cylindrical plug 25 of compressible material has an opening 26 therethrough into which is snugly fitted the adjacent end of the ejector 15 and from which the latter may be withdrawn when it is desired to clean the ejector. The plug 25 is slightly larger in diameter than the recess 23 and is provided about its periphery with a series of longitudinal grooves 27 extending the length of the plug and combining with the wall of the recess 23 to form small inlet passages for the admission of atmospheric air into the recess 23 and consequently into the ejector and its mouthpiece. The material of the plug 25 forming said grooves is compressed when the plug is inserted into the recess 23, but said grooves always remain slightly open to admit a certain amount of air into the ejector even when the openings 19, 20 are not closed. The entrance of air through the grooves under ordinary operating conditions will have no material effect upon the amount of suction required to withdraw the saliva from the mouth, but said grooves will afford an adequate relief to prevent an increase in the vacuum in the ejector should it happen that all three of the openings 19, 20 become closed, with the result that in the latter contingency the tissues of the mouth will not be injured.

In Figure 5 a slightly different form of ejector is shown in which the tube 28 may be of metal with its inner end fitted in the plug 25 in the same manner as the tube 15. The outer end of the tube is open to receive the mouthpiece 29 which may be of glass and which is constructed the same as the mouthpiece 17 and is slidably mounted within the tube 28 so that the effective length of the mouthpiece may be adjusted whenever desired.

Means are also provided for illuminating the mouth during the use of the ejector and in accordance with the present invention this means may take various forms. In Figure 1, a small incandescent lamp 30, such as used with surgical instruments, may be fused on the mouthpiece 17 to form a permanent part thereof and the conductors for the filament of said lamp may be imbedded in the glass of the ejector tube and led to terminals disposed in the plug 25, in somewhat the manner illustrated in Figure 5, for connection to a source of current. In Figure 2 the incandescent lamp 31 is shown as disposed directly within the ejector tube and located at a convenient position in the mouthpiece 17. The conductors 32 for the lamp may be made fairly rigid so as to support the latter in position and said conductors are led through the tube and into the recess 23 of the member 21 where they are connected to a tapered terminal plug 33 removably disposed in the member 21 so that it can be withdrawn to extract the lamp 31 from the ejector tube whenever desired. Provision is made on the plug 33 for connecting the conductors 32 to a source of current. In Figure 5, the metal tube 28 is provided along its outer surface with a grooved track 34 for receiving a plate terminal 35 of the incandescent lamp 36 which is movable in said trackway to permit of adjustments of the lamp to various positions. In this construction, the tube 28 forms one of the conductors for the lamp and at its inner end engages a ring contact 37 imbedded in the plug 25. The other conductor 38 of the lamp 36 is extended along the tube and connected to a second ring contact 39 also imbedded in the plug 25 and said contacts 37, 39 are joined by conductors 40 to a suitable source of current.

What is claimed is:

1. In a saliva ejector, a discharge tube having a mouthpiece at one end thereof, a guide member extending along said tube and forming an electrical conductor, and a source of light having a terminal engageable with said guide member for adjustment of said source along said tube.

2. In a mounting for a saliva ejector tube, a coupling including an outer member having an opening therethrough enlarged at one end to form a recess, and a plug into which an end of said ejector is adapted to be fitted and which is engageable in said recess in spaced relation to the inner end thereof, the periphery of said plug having grooves formed therein which combine with the wall of said recess to provide passages for the admission of air into said tube.

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