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3,101,545

DENTAL SALIVA EJECTORS

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FIG. 1.

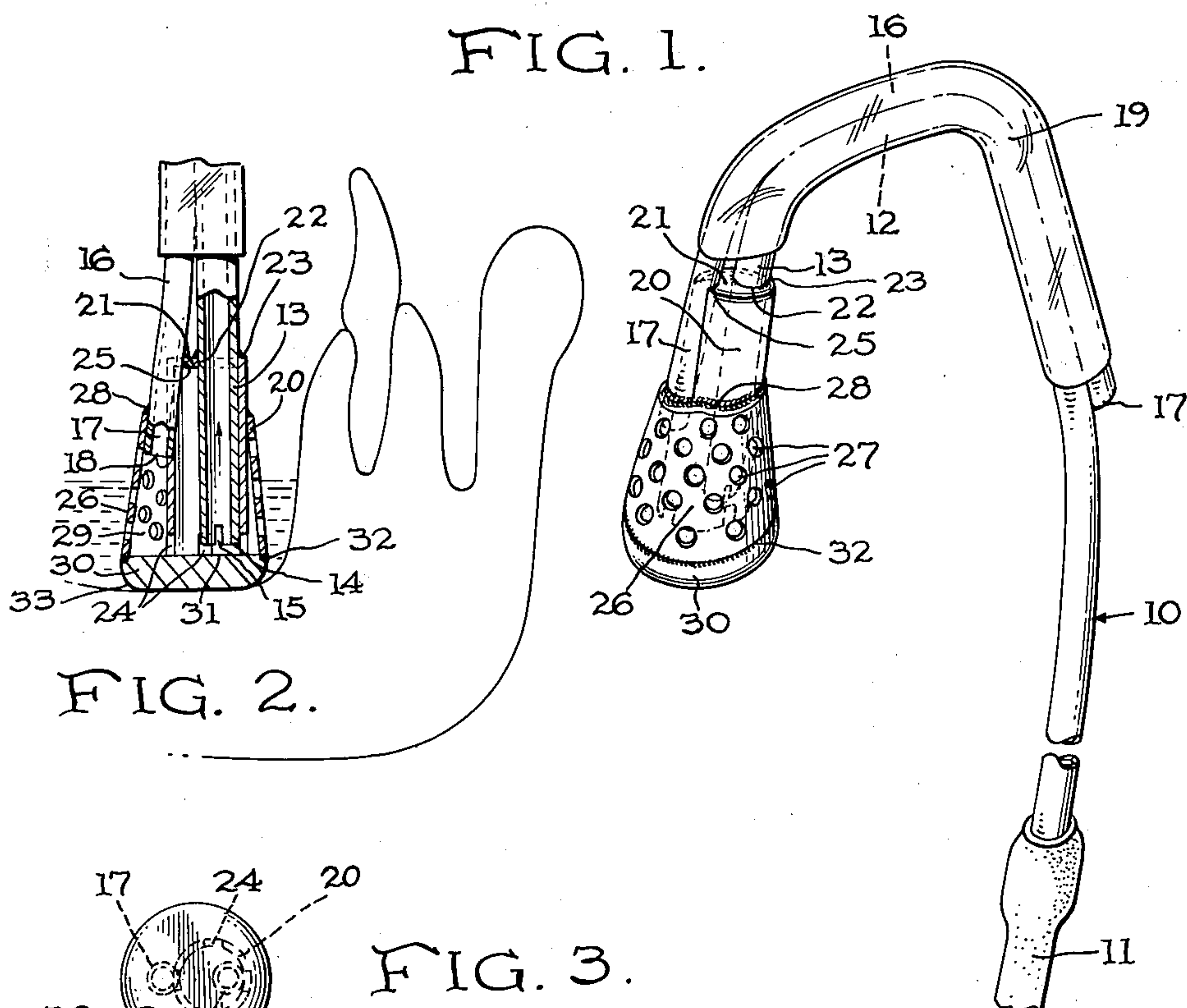


FIG. 2.

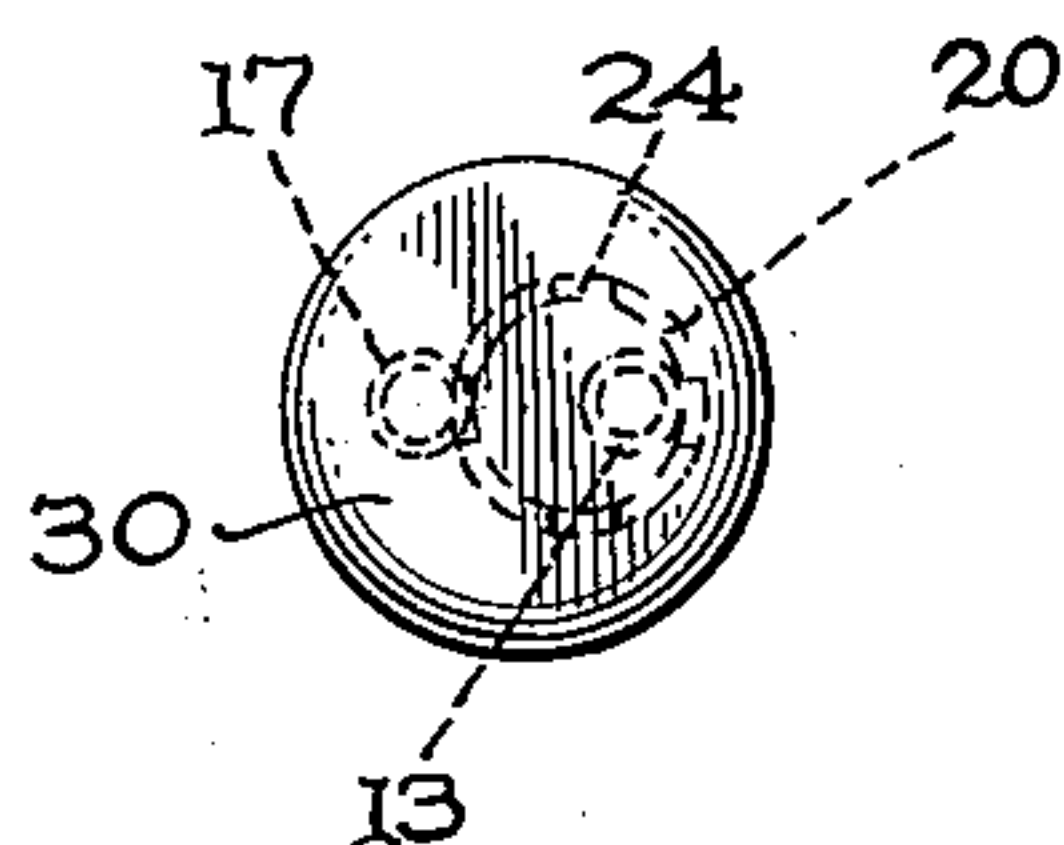


FIG. 3.

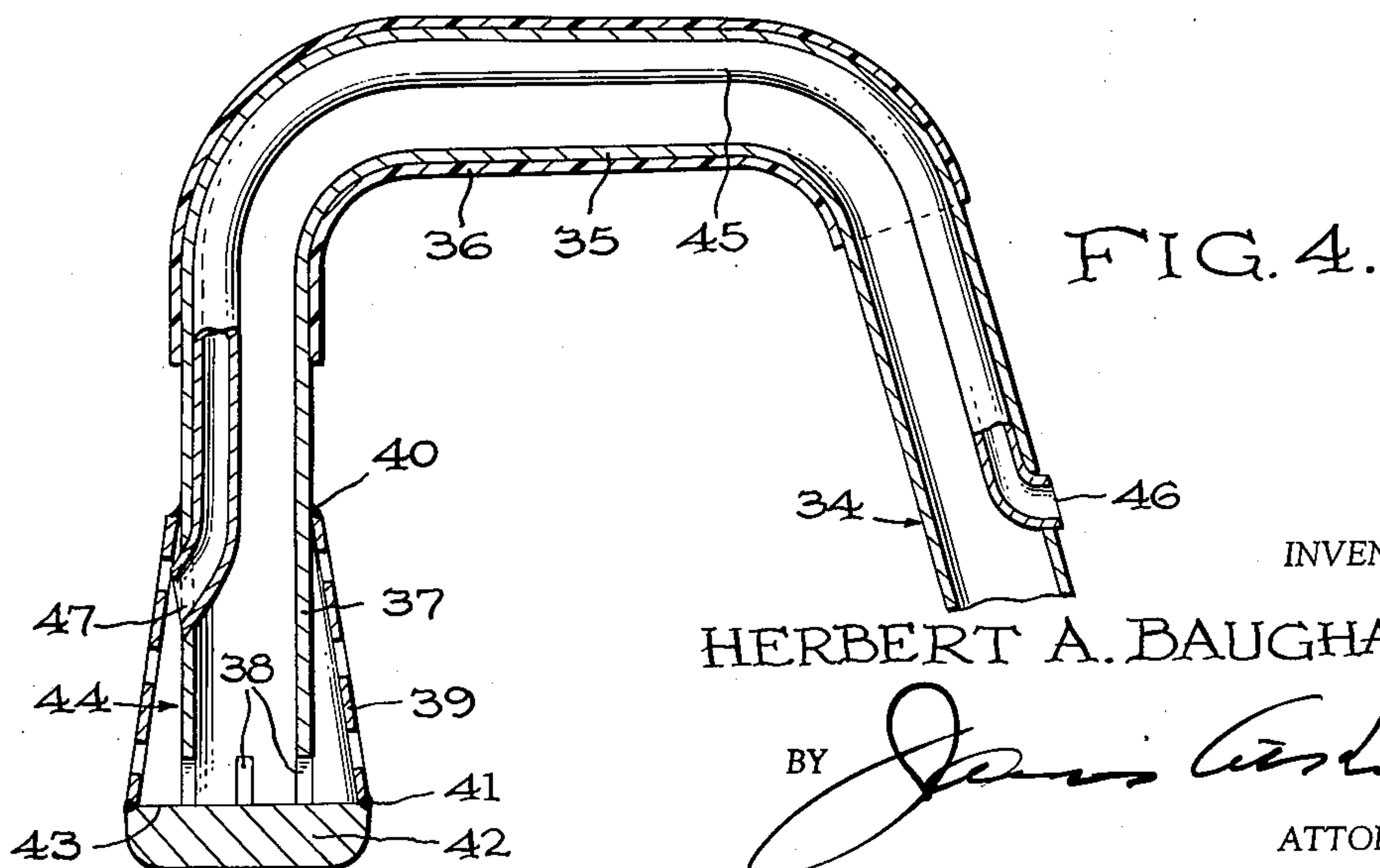


FIG. 4.

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DENTAL SALIVA EJECTORS

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1 Claim. (Cl. 32-33)

This invention relates to improvements in dental saliva ejectors.

A primary object of the invention is to provide a saliva ejector which will effectively remove saliva from the mouth of the patient without clogging and without discomfort to the patient by drawing the delicate mouth tissue into the suction openings of the device.

A further object is to provide a saliva ejector having a part to rest upon the floor of the mouth and slightly weight or depress the mouth tissue to eliminate contact with the suction openings of the ejector.

A further object is to provide a saliva ejector having improved suction relief means to completely eliminate the possibility of creating a greater than desirable degree of suction within the ejector in the event of blockage of certain suction openings with foreign matter or the like.

A further and more general object is to provide an improved dental saliva ejector which will enable the dentist by using the device to perform a dental prophylaxis rapidly and efficiently without the necessity for frequent interruptions while the patient expectorates, due to the fact that the saliva ejector is capable of withdrawing from the mouth all of the excess saliva, water and pumice slurry without clogging.

Other objects and advantages of the invention will become 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 in accordance with the invention,

FIGURE 2 is a central vertical cross section partly in elevation through the mouth-engaging end of the saliva ejector,

FIGURE 3 is a bottom plan view of the ejector as shown in FIGURE 2,

FIGURE 4 is an enlarged fragmentary central vertical section through a modified form of saliva ejector according to 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 3, wherein the numeral 10 designates a preferably metallic substantially rigid main suction tube adapted for connection at its lower end with a flexible hose 11 leading to a suitable suction source, not shown. The main suction tube 10 includes a hook-like top portion 12 for ready engagement over the lower lip and lower incisor teeth, and the portion 12 of the main suction tube carries a depending generally vertical mouth-engaging extension 13, disposed inside of the mouth during the use of the device and having its open end 14 terminating near and above the floor of the mouth and preferably slotted diametrically as at 15.

A suction relief tube 16 of considerable length parallels the hook-like portion 12 of main suction tube 10 and is permanently secured thereto in any suitable manner, as by soldering, welding or the like. The suction relief tube 16 has its outer open end 17 disposed well outside of the mouth during use, and the generally vertical mouth-engaging end portion 17 of the suction relief tube terminates a substantial distance above the end 14 of the main suction tube as shown in FIGURE 2. The lower end 18 of the suction relief tube is fully open.

The hook-like portion 12 of the main suction tube and

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the adjacent portion of the suction relief tube 16 are preferably enclosed in resilient plastics material 19 or the like, which may be in the form of a heavy coating or a separately formed sleeve applied over the tubes 12 and 16. The purpose of the covering 19 is to enhance the comfort of the patient by preventing direct contact of the teeth with either of the metallic tubes of the device.

A metallic sleeve or cylinder 20 surrounds the vertical extension 13 of the main suction tube 10, and this cylinder is upright and includes a top wall 21 having an opening 22 receiving the tube extension 13 therethrough, the latter being secured therein in a fluid tight manner by soldering or the like as at 23. The bottom end of the cylinder 20 is open and terminates slightly below the bottom end 14 of tube extension 13 and is preferably slotted as at 24 at a multiplicity of circumferentially equidistantly spaced points around the cylinder. It is preferred to provide four of the slots 24 in the bottom end of the cylinder 20 as shown. The cylinder 20 surrounds and encloses the tube section 13 below the hook-like portion 12 and the tube section 13 is disposed eccentrically within the upright cylinder 20 adjacent to one side wall portion thereof as best shown in FIGURE 2. One upper corner portion of the cylinder 20 may, if preferred, be recessed or cut away as at 25 to provide for the passage of the generally vertical portion 17 of suction relief tube 16 close to the tube section 13, FIGURE 2. The suction relief tube portion 17 is fixedly secured to the cut-away portion of the cylinder 20 in a fluid tight manner by soldering or the like. The cylinder 20 is therefore closed or impermeable except at its lower end provided with the slots 24.

An outer upwardly conically tapered sleeve 26 provided with a multiplicity of perforations 27 surrounds the cylinder 20 and the lower terminal portion of the suction relief tube somewhat eccentrically as shown in FIGURE 2. The upper end of the perforated outer sleeve 26 is fixedly secured to the cylinder 20 and tube portion 17 in a fluid tight manner by soldering or the like as indicated at 28. The lower flaring end of the outer sleeve 26 is spaced considerably from the side wall of cylinder 20 to provide an eccentric suction chamber 29 surrounding the same and in direct communication with the open end 18 of suction relief tube 16. The open end 18 of suction relief tube 16 is near the top of the chamber 29, as indicated. The chamber 29 is also in communication with the interior of the cylinder 20 through the slots 24, and indirectly in communication with the bore of extension 13 of the main suction tube.

The bottom end of the perforated sleeve 26 is covered and closed by a slightly weighted generally flat circular plate or disc 30, having a flat top face 31 engaging and covering the lower open end of cylinder 20. The lower end 14 of tube section 13 is spaced somewhat above the upper flat face 31 of disc 30, FIGURE 2. The disc 30 is secured by soldering or the like in a fluid tight manner at 32 to the lower end of sleeve 26. The circumferential edge 33 of disc 30 is preferably smoothly rounded so that no sharp corners or edges will contact the delicate mouth tissue. The bottom of the disc 30 is adapted to rest flush upon the floor of the mouth, inwardly of the lower gum and incisor teeth as shown diagrammatically in FIGURE 2.

In use, the saliva ejector is introduced into the patient's mouth in the manner described and shown generally in FIGURE 2. The outer open end 17 of the suction relief tube 16 extends fully outside of the mouth so that the patient cannot cover or block the suction relief tube with his lips, tongue or otherwise. The disc 30 may rest on the floor of the mouth, as suggested, or may be slightly elevated therefrom in some instances due to engagement of the lower incisor teeth with the hook-like portion 12

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of the main suction tube having the plastics covering 19. In any event, the relatively broad circular disc 30 will depress or hold down the soft mouth tissue so that the same will not tend to be drawn upwardly into direct contact with the perforated sleeve 26.

When suction is applied to the main suction tube 10 by way of the hose 11, the saliva in the mouth will be drawn through the perforations 27 into the suction chamber 29. From this chamber, the saliva will be drawn through the slots 24 into the lower portion of the cylinder 20 and then into the lower open end of the suction tube portion 13 and upwardly therethrough for complete ejection through the main suction tube. It has been discovered that the cylinder 20 and the slots 15 in the lower end of tube section 13 increase the efficiency of operation of the device.

Obviously, the tongue, lingual side of the lower gum or other mouth tissue cannot directly close or block the lower end 14 of the main suction tube, because the latter is fully enclosed and shielded by the disc 30, perforated sleeve 26 and associated elements. Should the tongue, soft mouth tissue, pumice slurry or other foreign matter clog all of the perforations 27 of outer sleeve 26, and should the degree of suction within the chamber 29 exceed desirable limits, this suction is immediately relieved through the relief tube 16, thereby rendering it impossible to exert an uncomfortable and sometimes damaging force upon the soft mouth tissue or tongue coming in contact with the perforated sleeve 26. It is very unlikely that many of the multiple perforations 27 would ever become clogged completely at the same time, but should this occur, the suction will be relieved instantly, as stated.

In FIGURE 4, there is shown a slight modification of the saliva ejector, wherein the main suction tube 34 has a somewhat larger diameter than the tube 10, but includes the same generally hook-like upper portion 35, preferably covered as at 36 with suitable plastics or other resilient material for the purpose previously specified. The main suction tube 34 has a substantially vertical depending mouth-engaging cylindrical terminal portion 37 integral therewith having its lower open end slotted at 38 in a manner similar to the slotting of the previously-described cylinder 20. An outer perforated upwardly conically tapered sleeve 39 surrounds the tube portion 37 concentrically and has its upper end firmly secured thereto in a fluid tight manner by soldering or the like as at 40. The lower flared end of the sleeve 39 terminates level with the lower end of tube portion 37 and is secured by soldering at 41 to a flat disc or plate 42, substantially identical to the previously-described disc 30. The upper flat face 43 of disc 42 abuts or covers the bottom open end of tube portion 37, as shown. A concentric annular upwardly tapering suction chamber 44 is formed between the sleeve 39 and vertical tube portion 37, as shown in the drawings.

In the embodiment shown in FIGURE 4, a suction relief tube 45 similar in length and function to the tube 16 extends inside of the main suction tube 34 and paralleling the hook-like portion thereof and fixedly secured thereto in any suitable manner. The outer open end 46 of suction relief tube 45 extends fully outside of the mouth during the use of the device as described in connection with the first form of the invention. The opposite end 47 of the suction relief tube 45 is also open and communicates directly with the top portion of the upwardly tapering suction chamber 44. The opposite end portions of the tube 45 are anchored in a fluid tight manner within openings formed through the main suction tube 34 for the reception of the suction relief tube, as shown.

The use or operation of the saliva ejector shown in FIGURE 4 is substantially the same as that of the previously-described form of the invention, and a further detailed description of the operation is therefore believed to be unnecessary herein. The construction in FIGURE 4 possesses the same basic advantages already enumerated

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in connection with the first form of the invention. The construction in FIGURE 4 is somewhat simpler in certain respects from the construction in FIGURE 1 and provides a very neat appearance and clean design by having the suction relief tube 45 disposed inside of the main suction tube.

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 claim.

Having thus described my invention, I claim:

A dental saliva ejector comprising a main suction tube for connection with a suction hose leading to a source of suction pressure and having a hook-like extension engageable over the lower incisor teeth, a depending integral tube extension on the hook-like extension of the main suction tube disposed within the mouth during use inwardly of the lower incisor teeth and terminating near and above the floor of the mouth and having its lower end open, a suction relief tube paralleling the hook-like extension and said depending extension of the main suction tube and fixedly secured to the hook-like extension and having a first open end disposed entirely outside of the mouth during use and a second open end disposed inside of the mouth and directed downwardly and spaced considerably above the lower end of said depending tube extension, a covering of resilient material substantially enclosing said hook-like extension and suction relief tube to prevent direct contact of the hook-like extension with the lower incisor teeth, an upright cylinder of considerably larger diameter than the depending tube extension and surrounding the latter eccentrically and having a closed top wall and an open lower end provided with a plurality of circumferentially spaced transverse slots; the lower end of said cylinder projecting somewhat below the lower end of said depending tube extension, said cylinder top wall having an opening receiving said depending tube extension and fixedly secured thereto in a fluid tight manner, said second open end of the suction relief tube disposed exteriorly of the side wall of said cylinder intermediate the top and bottom thereof, a perforated upstanding sleeve surrounding said cylinder and suction relief tube and having an upper end secured in fluid tight engagement to the cylinder and suction relief tube near and above the second open end of the suction relief tube and below the top wall of the cylinder, the lower end of said sleeve terminating substantially flush with the lower end of said cylinder, said sleeve flaring downwardly to provide a generally annular suction chamber around said cylinder and below said second open end of the suction relief tube, a weighted substantially flat disc element having a top face abutting the lower end of said cylinder and secured near its periphery in a fluid tight manner to the lower end of said sleeve and having a bottom face engageable with the floor of the mouth to depress the mouth tissue underlying the saliva ejector, the top face of said disc element spaced from the lower open end of said depending tube extension.

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