July 15, 1969 L. GELARIE 3,455,024

COMBINED MOUTH RETRACTOR AND SALIVA REMOVER

Filed May 20, 1966

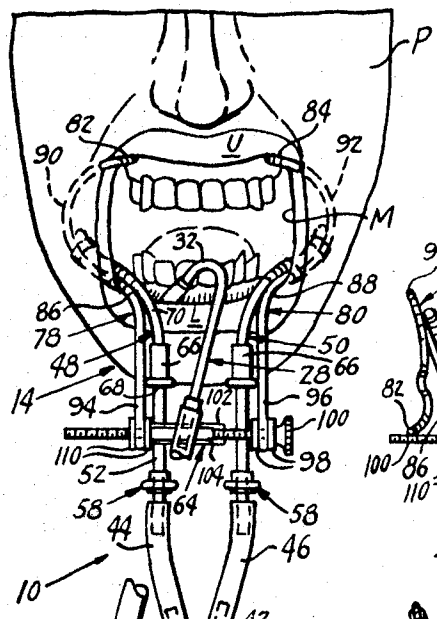

FIG. 1

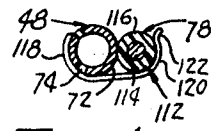

FIG. 4

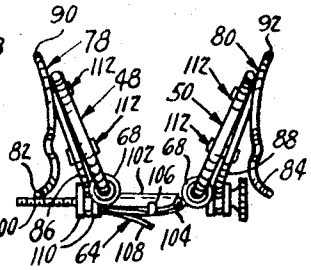

FIG. 3

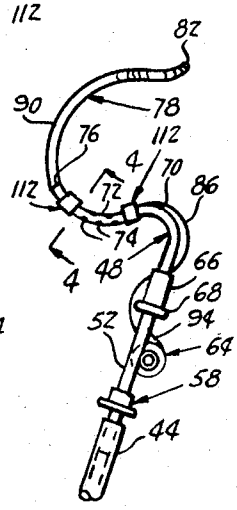

FIG. 2

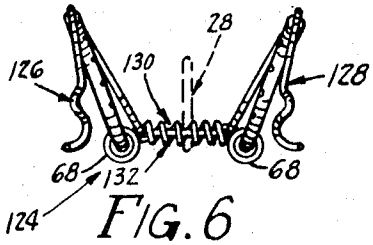

FIG. 6

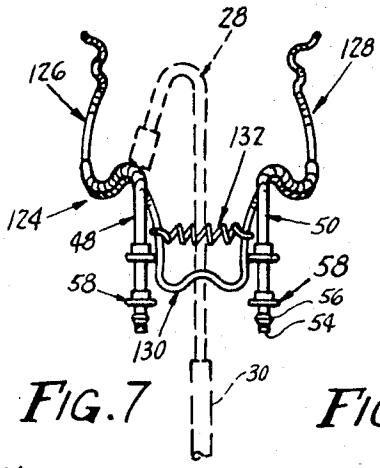

FIG. 7

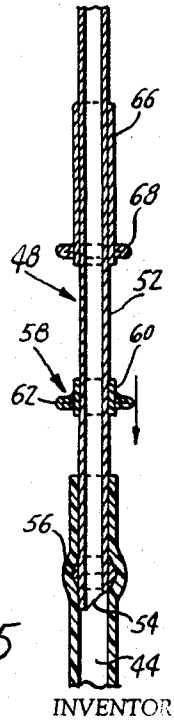

FIG. 5

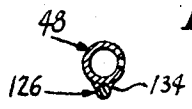

FIG. 8

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United States Patent Office 3,455,024
Patented July 15, 1969

3,455,024

COMBINED MOUTH RETRACTOR AND SALIVA REMOVER

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Filed May 20, 1966, Ser. No. 551,700
Int. Cl. A61c 5/00, 17/04
U.S. Cl. 32—33 8 Claims

ABSTRACT OF THE DISCLOSURE

A combined mouth retractor and saliva remover in which means are provided for adjusting the width of the retractor, and the retractor and saliva remover are joined together and shaped to the mouth of the patient.

This invention relates to a mouth retractor and more particularly to a device for withdrawing the lips from their normal position covering the oral cavity to facilitate either visual or physical access to the teeth and other body members within the cavity, and constitutes an improvement over United States Patent No. 3,214,550.

One of the difficulties in filling cavities and cleaning teeth is in the persuading of the patient to keep the mouth open and lips apart so that the dentist may have adequate access to the oral cavity. Another difficulty daily encountered by dentists is the removal of saliva from a patient's mouth contemporaneously with the filling of cavities and cleaning of teeth. Although various means have been suggested for solving these problems, they have not been widely accepted by the dental profession.

In brief terms, the instant invention comprises a device for simultaneously spreading the lips of a patient and removing saliva accumulated in the oral cavity consistent with patient comfort, access to the oral cavity, ease of utilization and low cost. Structurally, the instant invention includes a manifold adapted to be connected to a suction source, a pair of conduits configured to be received in the mouth of the patient and in communication with the manifold for transporting saliva and the like from the patient's mouth to the suction manifold, and a lip retractor secured to each of the suction conduits for spreading the lips of the patient to provide access to the oral cavity. Preferably, the invention also includes means for altering the distance between the lip retractors to take care of the variable physical characteristics of different patients.

It is a primary object of the instant invention to provide a device for spreading the lips of a dental patient equipped with means for contemporaneously removing saliva from the patient's mouth when the lip retractors are in place.

Another object of the instant invention is to provide a combined mouth retractor and saliva remover in which the lip holders are mounted for relative movement to accommodate the different physical characteristics of different patients.

Still another object of the instant invention is to provide a flexible tube connecting the suction manifold in the saliva removal conduits and means for readily removing the flexible tube from the conduits.

A further object of the instant invention is to provide a combined mouth retractor and saliva remover which is inexpensive to construct, convenient to use and comfortable when placed in the mouth of a patient.

Other objects and advantages of the instant invention reside in the combinations of elements, arrangements of parts, and features of construction and operation, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawing wherein there is shown a preferred embodiment of this inventive concept.

In the drawing:

FIGURE 1 is a front elevational view of a preferred embodiment of the combined mouth retractor and saliva remover constructed in accordance with the principles of the instant invention, showing the device operatively engaged in the mouth of a patient;

FIGURE 2 is a partial side elevational view of the combined mouth retractor and saliva remover of the instant invention;

FIGURE 3 is a top plan view of the combined mouth retractor and saliva remover of FIGURE 2;

FIGURE 4 is an enlarged cross-sectional view of the mouth retractor and saliva remover of FIGURES 1 to 3 inclusive, taken substantially along line 4—4 of FIGURE 2 viewing in the direction indicated by the arrows, illustrating a snap-on connection between the saliva removing conduit and the lip retracting element;

FIGURE 5 is an enlarged longitudinal cross-sectional view of the connection between the saliva removing conduit and the flexible tube connecting the conduit to the suction manifold illustrating the mechanism for readily separating the two components;

FIGURE 6 is a top plan view of another embodiment of the mouth retractor and the saliva remover of the instant invention illustrating a compression spring for selectively biasing the lip retracting elements into a position for spreading the patient's lips consistent with patient comfort;

FIGURE 7 is a front elevational view of the combined mouth retractor and saliva remover of FIGURE 6; and

FIGURE 8 is a cross-sectional view, similar to FIGURE 4, illustrating a different form of connection between the saliva removal conduit and the lip retracting element.

Referring now to the drawings in detail, wherein like reference characters designate like elements throughout the several views thereof, the combined mouth retractor and saliva remover of the instant invention is shown generally at **10** and has as its major components a saliva removal system shown generally at **12** and a lip retracting system shown generally at **14**. As will be explained more fully thereinafter, the device of the instant invention will be placed in the mouth M of a patient P such that lip retracting system **14** will hold the mouth in a spread position while saliva removal system **12** is connected to a vacuum source for removing liquid materials from the patient's mouth contemporaneously with the retention of the lips in a spread position.

Saliva removal system **12** includes a master suction manifold shown generally at **16** having an outlet passage **18** and a pair of inlet passages **20**, **22** configured in the shape of a Y. A flexible tube **24** is connected to outlet passage **18** by a suitable connector **26** with the other end of tube **24** being connected to a suitable vacuum source (not shown).

Interconnecting inlet passage **20** and a conventional saliva withdrawing device shown generally at **28** is a flexible tube **30** made of a conventional rubber or plastic material. Saliva withdrawing device **28** preferably has a slightly reverted end **32** formed by bending device **28** along a smooth curve. As is apparent to those skilled in the art, reverted end **32** may be placed either between the lower lip and the teeth or between the lower teeth and the tongue of the patient. Upon the actuation of the vacuum source, accumulated saliva will pass through device **28**, tube **30**, manifold **16** and tube **24** to a liquid disposal area.

Saliva removal system **12** also includes another flexible tube **34** interconnecting inlet passage **20** with an outlet passage **36** of a suction manifold shown generally at **38**. Suction manifold **38** includes a pair of inlet passages **40**,

42 each of which is received in a short piece of flexible hose 44, 46. A pair of saliva removal conduits shown generally at 48, 50 are connected to suction manifold 38 by hoses 44, 46 as shown in FIGURES 1, 2 and 5. It is manifest that the connection of tube 24 to a vacuum source will draw accumulated liquids through conventional saliva withdrawing device 28 as well as saliva removal conduits 48, 50.

Referring now more particularly to FIGURES 2 and 5, saliva removal conduit 48 will be described, it being understood that conduit 50 is a substantial mirror image. Conduit 48 includes a rigid tube 52 having a beveled outlet end 54 and a circumferential enlargement 56 adjacent end 54. It will be apparent that hose 44 is inserted onto the outlet end of tube 52 with enlargement 56 providing a sealed connection therebetween. A hose removing device shown generally at 58 is slidably mounted on tube 52 and includes a sleeve 60 of similar configuration as tube 52 and a circumferential outwardly extending flange 62. When it is desired to remove hose 44 from tube 52, it is necessary only to grasp flange 62 and push hose remover 58 against hose 44. Hose 44 will readily slide off the end of tube 52 in response to forces exerted on hose remover 58.

This manner of removing hoses 44, 46 from conduits 48, 50 has been found to be more convenient than pulling on the hose. This is particularly true in lightweight device similar to the instant invention since applying a pulling force invariably results in a quick release of the two components thereby creating a sizeable jerk. This jerk will result in a misalignment of the lip retractors and possibly a separation of the adjusting mechanism shown generally at 64 holding the lip retractors in a predetermined position.

Another sleeve 66 having an outwardly extending flange 68 is soldered or otherwise fixedly secured to tube 52 acting to strengthen tube 52 at a critical point. In addition, sleeve 66 cooperates with circumferential enlargement 56 to prevent hose remover 58 from sliding off either end of conduit 48.

Above sleeve 66, conduit 48 includes a smoothly curved section 70, concave toward the lower lip of the patient, extending over the lower lip as shown best in FIGURE 1. The next section 72 of conduit 48 is convex toward the lower part of the patient's mouth and forms, in conjunction with section 70, a concavo-convex length of tubing (FIGURE 2) lying in a single plane (FIGURE 3). As shown in FIGURES 1 and 3, the planes of conduits 48, 50 diverge toward the rear of the patient's mouth and lie between the teeth and cheeks of the patient. Section 72 is provided with a plurality of radial saliva entry apertures 74 with the terminal end 76 of conduit 48 being open to provide a large saliva entry orifice.

Lip retracting system 14 includes a pair of substantially identical lip retractors shown generally at 78, 80 interconnected by adjusting mechanism 64. Lip retractors 78, 80 include oppositely disposed upper lip engaging ends 82, 84 adapted to engage opposite portions of the upper lip U of the patient. Each of lip retractors 78, 80 also include lower portions defying oppositely disposed lower lip engaging means 86, 88 adapted to engage opposite portions of lower lip L of the patient and intermediate portions defining vertical spacing means 90, 92 interconnecting the upper and lower lip engaging means of each lip retractor.

As shown best in FIGURE 4, a snap-on connector shown generally at 112 secures saliva removal conduit 48 to lip retractor 78 which is illustrated as comprising a central wire core 114 surrounded by a resilient covering 116 such as rubber, plastic or the like. Connector 112 is a generally U-shaped structure having a first arm 118 affixed, as by soldering or the like, to conduit 48 and a second arm 120 having a reverted end 122 for firmly receiving lip retractors 78 between second arm 120 and conduit 48.

As shown in FIGURES 1 and 3, the lower end 94, 96 of each lip retractor 78, 80 is operatively connected to adjusting means 64. Lower end 96 of lip retractor 80 is fixedly secured between a pair of bosses 98 fixedly secured to a threaded shank 100 of adjusting means 64.

Adjusting means 64 also includes a sleeve 102 mounted for slidable movement with respect to shank 100 and an arm 104 biased toward shank 100 for engagement between the threads thereof. A protuberance 106 is fixedly secured to sleeve 102 intermediate the ends of arm 104 and cooperates with an operating handle 108 fixedly secured to the end of sleeve 102. From FIGURE 3 it will be seen that the forcible depression of handle 108 will depress arm 104 between protuberance 106 and the leftmost end of sleeve 102 to raise the free end of arm 104 out of engagement with the threads on shank 100. Lower end 94 of lip retractor 48 is fixedly secured to sleeve 102 between a pair of bosses 110 such that the adjustment of sleeve 102 with respect to shank 100 will vary the distance between lip retractors 78, 80.

When it is desired to place combined mouth retractor and saliva remover 10 in the operative position, handle 108 of adjusting means 64 is depressed to raise arm 104 out of engagement with the threads on shank 100. Sleeve 102 of adjusting means 64 is then pushed toward the right (FIGURES 1 and 3) to position lip retractors 78, 80 in their closest position. The patient is then asked to open the lips widely with vertical spacing means 90, 92 being inserted into the mouth until upper lip engaging ends 82, 84 and lower lip engaging means 86, 88 are juxtaposed to the patient's lips as shown in FIGURE 1.

The dentist or dental aide will then spread lip retractors 78, 80 by pulling conduits 48, 50 apart to position lip retractors 78, 80 in the position shown in FIGURE 1. Because of the curvature of arm 104, as seen in FIGURE 3, sleeve 102 may be pulled to the left with respect to threaded shank 100 without necessitating the depression of operating handle 108. Conventional saliva withdrawing device 28 may then be positioned in the patient's mouth with tube 24 being connected to the vacuum source to draw accumulated liquid through saliva removal system 12 during the conduct of the dental activities.

Referring now to FIGURES 6 to 8 inclusive, another form of combined mouth retractor and saliva remover is shown generally at 124. A comparison of the several views of the drawing will reveal that embodiments 10, 124 have many features in common for which identical reference characters will be used for purposes of brevity. Embodiment 124 includes a pair of lip retractors 126, 128 joined together by a substantially W-shaped wire structure shown generally at 130 and a compression spring illustrated generally at 132. It will be apparent that wire structure 130 will allow relative movement between retractors 126, 128 (which differ from lip retractors 78, 80 only in the deletion of resilient covering 116) while compression spring 132 acts to bias retractors 126, 128 apart. Although it has not been found necessary, a suitable telescoping guide may be provided interiorly of compression spring 132 to prevent lateral buckling thereof.

Mouth retractor and saliva remover 124 also includes a pair of conduits 48, 50 of the type previously described. As shown in FIGURE 8, conduit 48 and lip retractor 126 are fixed securely together by soldering or the like 134. Since the mode of use of embodiment 124 is substantially the same as that of embodiment 10 with the exception of the automatic operation of compression spring 132 rather than the selective operation of adjusting means 64, further remarks concerning the use of the embodiment of FIGURES 6 to 8 inclusive is deemed unnecessary.

It is now seen that there is herein provided a combined mouth retractor and saliva remover which accomplish all of the objects of the instant invention and others, including many advantages of great practical utility and commercial importance.

Since many embodiments may be made of the instant

inventive concept, and since many modifications may be made of the embodiments hereinbefore shown and described, it is to be understood that the foregoing is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. A combined mouth retractor and saliva remover comprising:

a suction manifold having an outlet passage and a pair of inlet passages;

a pair of substantially rigid conduits having a first segment for placement adjacent the chin of the patient, a second segment for placement over the lower lip of the patient and a third apertured segment for placement in the mouth of the patient for receiving saliva upon the induction of air through the conduit and manifold;

means connecting each conduit in fluid transmitting relation to one of the inlet passages of the suction manifold;

a pair of substantially rigid lip retractors for maintaining the lips of a patient in spread condition;

means securing each lip retractor to one of the conduits in mirror image relation; and

screw means extending between said lip retractors at the end thereof opposite the end extending into the patient's mouth for adjusting the space between said lip retractors for fitting mouths of varied sizes.

2. The combined mouth retractor and saliva remover of claim 1 wherein the second segment of the conduit is concave toward the lower lip of the patient, the third segment of the conduit is convex toward the bottom of the patient's mouth and the second and third segments lie substantially in a plane.

3. The combined mouth retractor and saliva remover of claim 2 wherein the planes defined by the second and third segments of each lip retractor diverse toward the rear of the patient's mouth and are arranged to be received between the teeth and cheek of the patient.

4. The combined mouth retractor and saliva remover of claim 3 wherein the third segment includes a plurality of radial apertures and an open terminal end for saliva entry.

5. The combined mouth retractor and saliva remover of claim 1 wherein the connecting means includes a flexible hose surrounding the end of the conduit.

6. A combined mouth retractor and saliva remover comprising:

a suction manifold having an outlet passage and a pair of inlet passages;

a pair of substantially rigid conduits having a first segment for placement adjacent the chin of the patient;

a second segment for placement over the lower lip of the patient and

a third apertured segment for placement in the mouth of the patient for receiving saliva upon the induction of air through the conduit and manifold;

means connecting each conduit in fluid transmitting relation to one of the inlet passages of the suction manifold;

a pair of substantially rigid lip retractors for maintaining the lips of a patient in spread condition; and

means securing each lip retractor to one of the conduits in mirror image relation comprising a U-shaped clip having a first leg and a spaced second leg, the conduit being between the first and second legs and fixedly secured to the first leg, the lip retractor residing between the conduit and the second leg.

7. The combined mouth retractor and saliva remover of claim 6 wherein the connecting means includes a flexible hose surrounding the end of the conduit and hose removal means, slidably mounted on the conduit adjacent the hose, for engaging and pushing the end of the hose toward the end of the conduit in response to a force applied on the hose removal means parallel to the conduit toward the hose.

8. The combined mouth retractor and saliva remover of claim 7 wherein the hose remover includes a sleeve, mounted on the conduit for slidable movement therealong; and a flange, extending outwardly of the sleeve, providing an abutment against which the force may be applied.

References Cited

UNITED STATES PATENTS

2,603,870	7/1952	Nordin	32—33
2,859,519	11/1958	Cohn	32—33

LOUIS G. MANCENE, Primary Examiner

J. W. MITCHELL, Assistant Examiner