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Satchell

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[54] **SUCTION DRAINAGE CONTROL CONNECTOR**

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[52] **U.S. Cl.** ..... **128/276;** 128/350 R

[51] **Int. Cl.** **A61m 1/00**

[58] **Field of Search** 128/185, 199, 200, 206, 128/276–278, 297, 343, 348–351; 15/419, 421; 32/33

[56] **References Cited**

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[57] **ABSTRACT**

A suction drainage control connector for use in a medical-surgical drainage system to connect a drainage catheter or tube to a source of suction. The connector has an inlet passage for connection to the catheter, an outlet passage for connection to the source of suction, and a suction control passage adapted to be selectively covered and uncovered by the finger of the user to regulate the suction applied to the catheter. A relief port is provided in the suction control passage to provide for continuous flow from the control passage to the outlet passage to prevent reflux of the aspirated fluid into the control passage and contamination of the sample and/or finger of the user.

5 Claims, 3 Drawing Figures

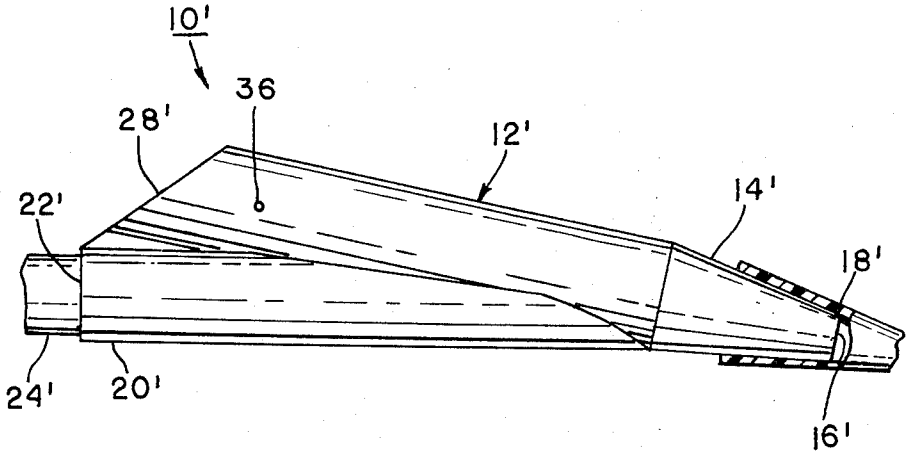


FIG. 1

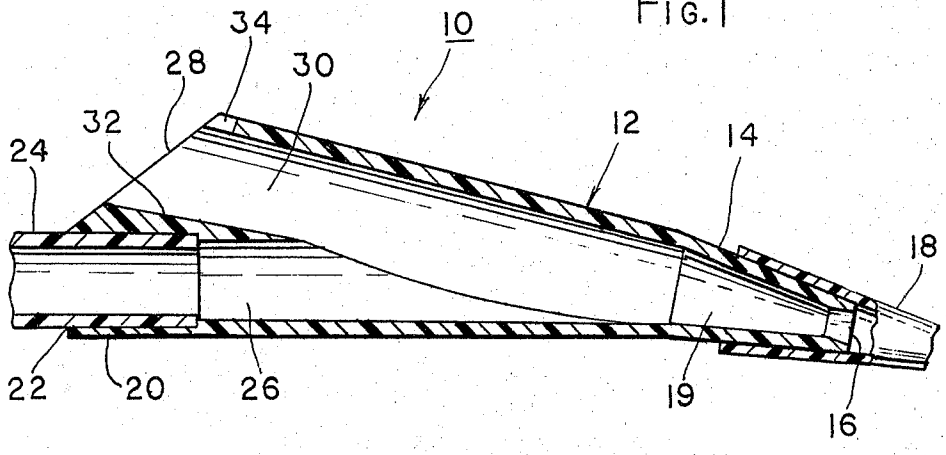


FIG. 2

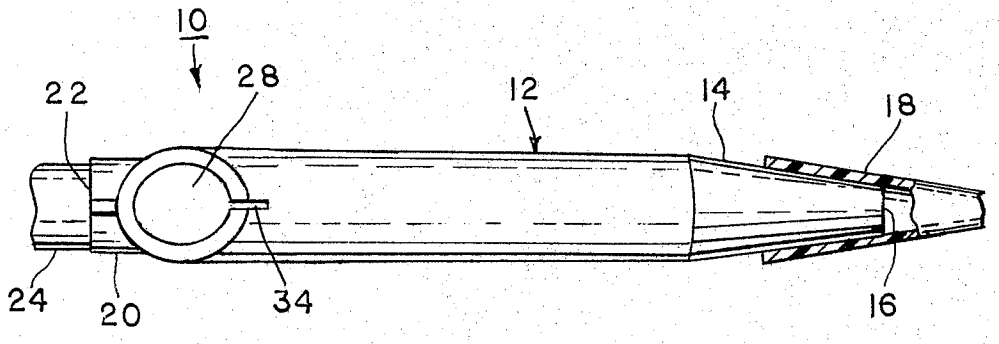
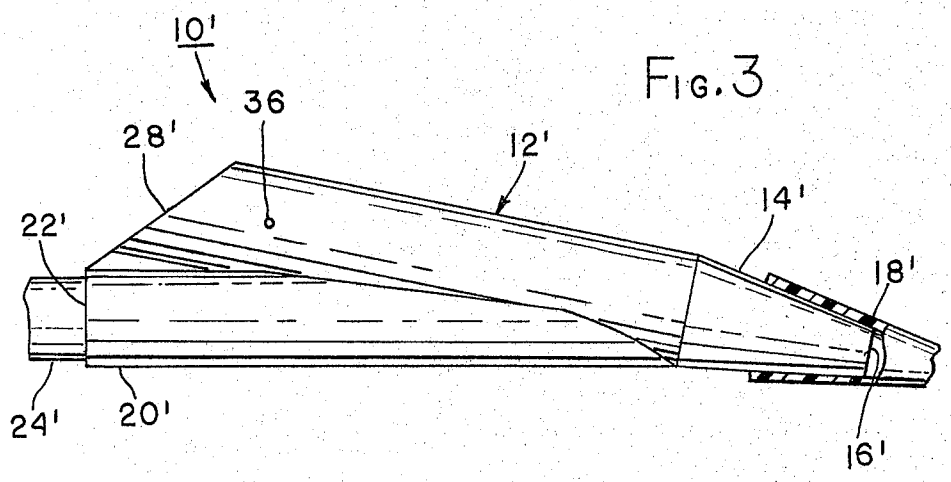


FIG. 3



SUCTION DRAINAGE CONTROL CONNECTOR

BACKGROUND OF THE INVENTION

This invention pertains to a suction drainage control connector for use in connecting a drainage or suction catheter to a source of suction in a medical-surgical drainage system for aspiration of various cavities of the human anatomy, such as the nose, mouth, larynx, trachea and lungs, or for aspiration of a surgical field during surgery. In such use, it is common practice to leave the catheter in place for extended periods of time while only selectively applying suction as desired. In order to accomplish this, it is conventional practice to provide either a vent aperture or a suction control connector at the proximal end of the catheter so that the suction at the distal end of the catheter may be controlled by applying a thumb or finger over either the vent aperture or the vent port of the connector.

The use of a separate suction control connector, rather than a vent aperture in the catheter, is desirable in that the vent port of the control connector can be located outside of the normal flow path through the connector from its inlet to its outlet ports so as to avoid contact of the thumb or finger with the aspirated fluid, thereby preventing both contamination of the fluid sample being aspirated and the thumb or finger of the user. This type of device is illustrated in the pending U.S. application of Ralph D. Alley, filed Oct. 26, 1972, Ser. No. 301,259, now abandoned, assigned to the same assignee as the present invention.

While the need for isolating the finger of the user from the aspirated fluid sample has been recognized, and while prior suction control connector designs such as set forth above have at least partially solved this problem, under certain circumstances of use such designs may permit reflux of the aspirated sample into the control passage of the regulator and into contact with the finger of the user. Accordingly, there continues to be a need for a suction control connector which isolates the aspirated fluid sample from the finger of the user under all conditions of use.

SUMMARY OF THE INVENTION

Accordingly, among the several objects of the present invention may be noted the provision of a suction drainage control connector which assures complete isolation of an aspirated fluid sample from the finger of the user, and the provision of such a connector which is characterized by simplicity of construction, low cost and ease of operation and use.

In general, a suction drainage control connector constructed in accordance with the present invention comprises an elongated hollow body having an outlet passage terminating in a port adapted to communicate with a source of suction, an inlet passage in fluid communication with the outlet passage and having a port adapted to receive a suction or drainage catheter, and a suction control passage in fluid communication with said inlet and outlet passages. The control passage terminates in a port adapted to be selectively occluded by the finger of the user to regulate the suction applied to the catheter. In addition, the control passage has a relief port intermediate the control port and the outlet passage for providing continuous flow through the control passage to the outlet passage when the control port is occluded.

These and other objects and features of the invention will be in part apparent and in part pointed out hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional view of the suction drainage control connector of this invention;

FIG. 2 is a top plan view of the connector of FIG. 1; and

FIG. 3 is a side elevation view of a modified embodiment of the control connector of this invention.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and particularly to FIGS. 1 and 2, the present suction drainage control connector is indicated generally at 10 as comprising an elongated hollow body 12 having at its proximal end a tapered male connector 14 terminating in an outlet port 16. The male connector 14 is adapted to receive a connecting tube, illustrated at 18, for connection to a source of suction, such as a conventional vacuum pump or hospital wall suction system. As will be realized, however, a specimen collection chamber or other suitable reservoir or device may be interposed in the connecting tube 18 between the control connector 10 and the source of negative pressure. The bore of the hollow connector 14 defines an outlet passage 19.

A female connector 20 is provided at the distal end of the body 12 with an inlet port 22 for receiving a conventional suction or drainage catheter 24. The inlet port 22 opens into an inlet passage 26 which extends generally axially within the body 12 into fluid flow communication with the outlet passage 19.

An inclined suction control port 28 is also provided near the distal end of the connector body 12. The port 28 opens into a control passage 30 which merges, and is in fluid communication, with both the outlet and inlet passages 19 and 26, respectively. The control passage 30 is separated from the inlet passage 26 by an integral web or wall 32 which extends from near the distal end of the body 12 generally axially toward the outlet passage 19.

The suction drainage control device described thus far is conventional in structure and is used in a conventional manner. For example, for nasal pharyngeal suctioning, the connector 10 may be supplied with a conventional suction catheter 24 bonded within the bore of the female connector 20. Alternatively, the connector 10 may be supplied without a catheter and any desired suction catheter used therewith. For this purpose, it should be understood that various types of fittings may be provided at the distal end of the inlet passage 26 for connection to a variety of different types of suction catheters. In this regard, reference is made to the suction control device described in the aforementioned application of R.D. Alley, Ser. No. 301,259, now abandoned.

Once the suction catheter is attached to the connector 20, a suitable connecting tube 18 is telescoped over the tapered male connector 14 at the outlet end of the device 10. Again, reference is made to pending application Ser. No. 301,259, now abandoned, for alternate types of attachment fittings. With the connecting tube

18 in communication with a suitable source of negative pressure, the distal end (not shown) of the suction catheter 24 is inserted into the desired body cavity while the control port 28 is uncovered to permit maximum air from the atmosphere to flow into the control passage 30 so as to apply minimum or no suction at the distal end of the suction catheter. When it is desired to apply suction to the distal end for aspiration of fluids from the cavity, the control port 28 is either completely or partially covered or occluded by either the thumb or finger of the user. As described above, however, even though the control port 28 is outside of the normal flow path of fluid from the inlet port 22 to the outlet port 16 of the connector 10, under certain conditions of use, for example under high vacuum or when successively covering and uncovering the control port, the fluid passing through inlet passage 26 to outlet passage 19 can reflux into control passage 30 and contact the finger covering port 28, thereby contaminating either the finger or the fluid sample.

The present invention overcomes the above noted problem by providing means for assuring a continuous flow of air from the atmosphere toward the outlet passage 19. In the embodiment illustrated in FIGS. 1 and 2, this is accomplished by providing a relief port 34 in the form of an elongate slot opening into the control port 28 and extending through the wall of body 12 to the passage 30. As will be noted, when the control port 28 is occluded by the thumb or finger of the user, the relief port 34 will be unobstructed and will provide an air inlet for the continuous flow of air from the atmosphere through the control passage 30 to the outlet passage 19. This continuous flow of air during operation of the device, prevents reflux of aspirated fluid from entering the control passage 30 and contacting the finger of the user by establishing a flow of air in a direction away from the port 28 and reducing or limiting the suction force at the inlet port.

The embodiment of the suction control connector 10' illustrated in FIG. 3 is identical to that described above except that the relief port is in the form of a circular hole or aperture 36 provided through the wall of the connector 12 into the control passage 30 in lieu of the slot 34. As will be understood, the aperture 36 operates to cause a continuous flow of air from the atmosphere in the control passage 30 in the same manner as described above with regard to slot 34. Relief port 36 is spaced proximally from the control port 28 and this further insures against any possibility of the thumb or finger of the user inadvertently simultaneously closing both the control port and relief port.

In both of the embodiments of the invention described above, the relief ports extend through the body wall forming the control passage and are disposed closer to the distal end of the control passage. Also, the cross-sectional area of the relief ports 28 or 28' should be substantially less than the cross-sectional area of control port (slot 34 of FIGS. 1 and 2 or aperture 36 of FIG. 3) to insure against reflux of the fluid while permitting efficient aspiration through the catheter. In one case, a control connector was made with inlet and outlet ports of approximately 0.12 inch diameter and with the control port of somewhat larger diameter. The relief port of the type shown in FIG. 3 was provided in the wall of the control passage and had a diameter of approximately 0.031 inch. The control connector performed satisfactorily at suction values even as high as 20 inches of mercury.

The control connector 10 of this invention is preferably made of a low cost material so as to enable disposal after a single use. For example, the connector may be made of any suitable material, preferably an injection moldable plastic material such as ABS, a high impact styrene.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results obtained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all material contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A suction drainage control connector, comprising an elongate hollow body having an outlet passage terminating in an outlet port adapted to communicate with a source of suction, an inlet passagge in fluid communication with said outlet passage and having an inlet port adapted to receive a suction catheter, and a suction control passage in fluid communication with said inlet and outlet passages and terminating in a control port adapted to be occluded by the user to regulate the suction applied to said catheter, said control passage extends angularly relative to said inlet passage, and said body having a relief port extending through the side wall of said control passage to the atmosphere between said control port and said outlet port for providing a continuous flow of air in said control passage toward said outlet passage from the atmosphere when said control port is occluded, and wherein the cross-sectional area of said control port is substantially greater than the cross-sectional area of said relief port.

2. The suction control connector as set forth in claim 1 wherein the cross-sectional area of said relief port is approximately 0.031 inch in diameter.

3. The suction control connector as set forth in claim 1 wherein said relief port is an aperture extending through the wall of said hollow body into said control passage and spaced from said control port.

4. The suction control connector as set forth in claim 1 wherein a portion of said body extends proximally from said control port toward said outlet port between said control and inlet passages.

5. A suction drainage control connector, comprising an elongate hollow body having an outlet passage terminating in a port adapted to communicate with a source of suction, an inlet passage in fluid communication with said outlet passage and having a port adapted to receive a suction catheter, and a suction control passage in fluid communication with said inlet and outlet passages and terminating in a control port adapted to be occluded by the user to regulate the suction applied to said catheter, said body having a relief port intermediate said control port and said outlet port for providing a continuous flow of air through said outlet passage from the atmosphere when said control port is occluded, said relief port being an elongate slot extending from said control port toward said outlet passage through the wall of said hollow body.

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