

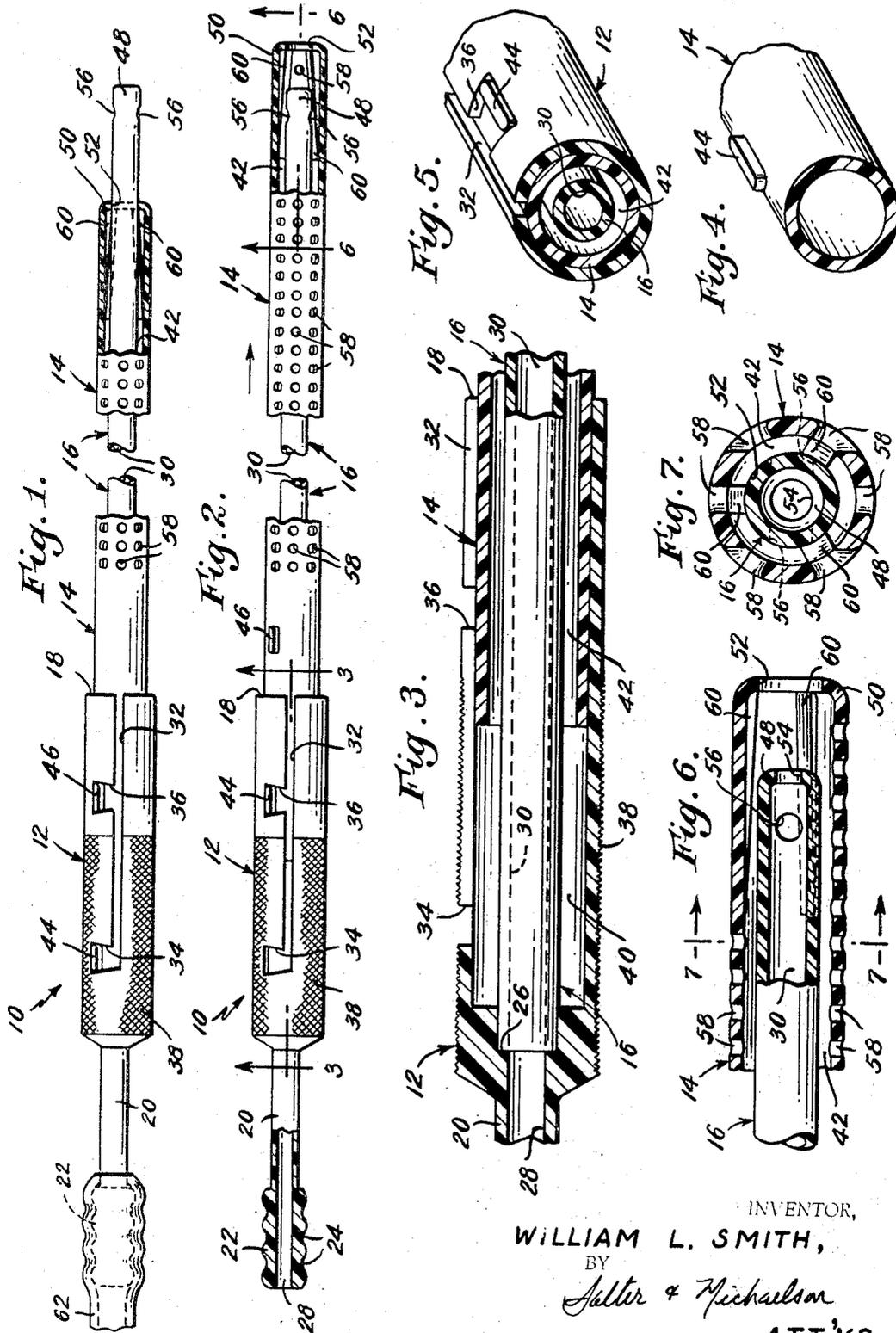
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ABDOMINAL SUCTION DRAINAGE TUBE

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**ABDOMINAL SUCTION DRAINAGE TUBE**

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**ABSTRACT OF THE DISCLOSURE**

An abdominal suction tube comprising a minimum number of parts, each of which may be molded, whereupon the tube may be of the throw-away variety, said tube having an outer sleeve and an inner tube concentrically mounted therein, said outer sleeve being movable with respect to said inner tube whereupon the tip of the latter may be exposed when fine suctioning is desired, said sleeve being movable to a second position wherein said inner tube is completely contained therein, said outer sleeve having a plurality of apertures therein for effecting gross suctioning when the inner tube is retracted into said outer sleeve.

The present invention relates generally to surgical devices and is particularly concerned with the provision of a novel and improved abdominal suction tube.

It is common practice during the performance of abdominal surgery to utilize a suction tube in order to help keep the surgical field as free of blood as possible in order to improve access and visibility to the surgical area for the surgeon performing the operation. The free flow of blood in the surgical area is controlled as much as possible by the clamping of veins and arteries to the extent that such clamping can be effected. It is not possible, however, to clamp off all blood capillaries, and hence, as afore indicated, it is common practice for a nurse or other surgical assistant to hold a suction tube adjacent the surgical field whereby loose blood will be carried away from the critical area.

Suction tubes of this type now in common use have exhibited certain shortcomings. First of all, it is conventional practice to make these tubes of metallic construction and then clean the tubes after each use for subsequent use. Since this type of suction tube is necessarily provided with a plurality of small apertures, it has been found to be exceedingly difficult to properly clean this equipment, and it has been found that in order to properly clean these tubes, much time and expense is involved.

It is therefore a primary object of this invention to provide an abdominal suction tube of the character described that is relatively simple and inexpensive to manufacture, and that specifically is made up of only three separate parts, each of which is constructed of molded plastic. This enables the unit to be disposed of after each use, thereby eliminating the time and expense presently involved in properly cleaning existing tubes of this type.

Another problem or disadvantage that exists with the metallic abdominal suction tubes presently being used is as follows. Tubes of this nature traditionally comprise an outer tube having a plurality of openings therein and an inner tube located within said outer tube, said inner tube being connected to the source of suction. In some surgical situations, where gross suctioning is required, i.e., there is a substantial amount of blood to be removed, the suction tube is used in its assembled relation, that is, with the outer tube secured in position over the inner tube. On the other hand, where the surgical situation necessitates fine suctioning, such as where there is not an abundance of blood to be removed or where it is not physically pos-

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sible to manipulate the thicker outer tube in the surgical area, it is common practice to remove the outer tube and use the finer inner tube alone as the suctioning device. The problem here, however, is that wherever it is desired to go from gross suctioning to fine suctioning, or vice versa, it is necessary to disassemble or assemble the component parts of the suction tube, a procedure which is both cumbersome and time consuming.

It is therefore a further important object of the instant invention to provide an abdominal suction tube that may be easily converted to use for gross suctioning or fine suctioning without the necessity of ever having to disassemble any of the component parts. Thus, it is an important object of this invention to provide an abdominal suction tube that may be used for either gross suctioning or fine suctioning and that may be easily and quickly converted to whichever use is desired.

A further object is the provision of an abdominal suction tube of the character described that is light in weight, easy to manipulate, and durable and effective in use.

Other objects, features and advantages of the invention will become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawings.

In the drawings which illustrate the best mode presently contemplated for carrying out the present invention:

FIG. 1 is a top plan view, partly in section, of an abdominal suction tube constructed in accordance with the instant invention, said tube being shown in its fine suctioning position;

FIG. 2 is a view similar to FIG. 1 with the parts shown in gross suctioning position;

FIG. 3 is an enlarged section taken on line 3—3 of FIG. 2;

FIG. 4 is an enlarged fragmentary perspective view of the sleeve member which forms a part of my invention;

FIG. 5 is an enlarged fragmentary perspective view showing the assembly of the handle portion, sleeve member and inner tube;

FIG. 6 is an enlarged section taken on line 6—6 of FIG. 2; and

FIG. 7 is an enlarged section taken on line 7—7 of FIG. 6.

Referring now to the drawings, and more particularly to FIGS. 1 and 2, there is shown generally at 10 an abdominal suction tube constructed in accordance with the instant invention. The tube or unit 10 comprises three parts, namely, a handle portion 12, a sleeve member 14, and an inner tube 16. All of these parts are preferably constructed of a molded plastic, it being understood that any suitable inert, nontoxic plastic having sufficient rigidity and strength may be used.

As will be seen most clearly in FIGS. 2 and 3, handle portion 12 is of tubular configuration having an open end 18 at one extremity and a reduced integral tubular extension 20 at its other extremity. The extension 20 terminates in an integral enlarged portion 22 having peripheral corrugations 24 extending therearound, the purpose of which will hereinafter become apparent. As will be seen most clearly in FIG. 3, handle portion 12 is provided with an internal shoulder 26 which is adapted to snugly and fixedly receive the inner tube 16. Thus, it will be seen that the bore 28 of tubular extension 20 is in communication and in alignment with the bore 30 of inner tube 16 when the latter is fixedly secured against shoulder 26 in handle portion 12. As will be seen most clearly in FIGS. 1 and 2, handle portion 12 is provided with an elongated slot 32 from which laterally extend a spaced pair of diverging openings 34 and 36. Note that the slot 36 extends all the way to the end 18 of handle portion 12. For easier

and more positive gripping, a substantial portion of the outer surface of handle portion 12 is knurled or otherwise roughened, as at 38.

As previously explained, inner tube 16 is secured against reduced shoulder 26 in the handle portion 12, thus defining an annular channel 40 located between the outer surface of inner tube 16 and the inner surface of handle portion 12. The annular channel 40 is adapted to slidably receive therein the sleeve member 14, it being noted in FIG. 3 that the sleeve member makes a snug sliding fit within handle portion 12, it further being noted that the inner diameter of sleeve member 14 is larger than the outer diameter of inner tube 16 so as to provide an annular space 42 therebetween. Sleeve member 14 is provided with a pair of spaced upwardly extending lugs 44, 46, the spacing between said lugs being equal to the spacing between the aforescribed openings 34, 36. The width of the lugs 44, 46 is just slightly greater than the cross dimension of the divergent ends of openings 34 and 36, whereupon when the lugs are engaged in said slots, as illustrated in FIG. 1, they will be releasably maintained in said position due to the interference fit which they make with the divergent ends of the openings. When the parts are in the position illustrated in FIG. 1, i.e., lug 44 is engaged in opening 34 and lug 46 is engaged in opening 46, it will be seen that the free end 48 of inner tube 16 extends outwardly beyond the adjacent free end 50 of sleeve member 14. The terminal end 50 of sleeve member 14 is provided with an opening 52 through which inner tube 16 may extend, as illustrated in FIG. 1. Inner tube 16 is in turn provided with an opening 54 at end 48 (FIG. 6) and is likewise provided with a pair of diametrically opposed openings 56 located adjacent to but spaced from the end 48. As will be seen clearly in FIGS. 1 and 2, sleeve member 14 is provided with a plurality of openings 58 extending around the entire periphery of the member 14 for a substantial distance from the end 50 thereof. It will be seen that the openings 58 provide communication to annular space 42. In order to keep inner tube 16 properly centered within sleeve member 14, a plurality of inwardly extending ribs 60 are provided integral with the inner surface of sleeve member 14, it being noted that said ribs converge toward opening 52 in order to properly guide inner tube 16 therethrough when the unit is in the position illustrated in FIG. 1.

In FIG. 2, the sleeve member 14 has been moved so that lug 44 is engaged in notch or opening 36, thus extending the sleeve member 14 with respect to handle portion 12 so that inner tube 16 is no longer exposed. It will be understood that this is the gross suctioning position of the device, whereas FIG. 1 illustrates the fine suctioning position of the unit 10.

Since the slot 32 extends all the way to end 18 of handle portion 12, sleeve member 14 may be easily assembled or disassembled, since it is simply necessary to rotate the sleeve member until the lugs 44 and 46 are aligned with slot 32, whereupon the sleeve member may then be easily removed. Obviously, assembly of the parts is easily accomplished by the reverse procedure.

Suction is applied to the unit by any suitable means (not shown), and in this connection, a flexible tubing 62 may be forceably engaged over the enlarged end portion 22, it being understood that the peripheral convolutions 24 will help maintain the tubing 62 in tight assembly with the portion 22, thus lessening the likelihood of inadvertent detachment of the tubing 62 from unit 10.

In operation and use, the unit 10 is connected to any suitable source of suction, it being understood that the suction passes through flexible tube 62 to bore 28 and then to bore 30 in the inner tube 16. Where the surgical situation is such that fine suctioning is required, the device 10 is positioned with its parts as illustrated in FIG. 1, that is, with lug 44 releasably locked in notch or opening 34 and with lug 46 releasably locked in notch or opening 36. With the parts in this position, the inner tube 16 ex-

tends outwardly through opening 52 in movable sleeve 14 and terminates at a point substantially therebeyond. Thus, the relatively fine end 48 of inner tube 16 performs the desired suctioning operation, it being understood that blood will be sucked in through the openings 54 and 56 at the terminal end of inner tube 16. If, on the other hand, it is desired to convert the device 10 to perform gross suctioning, it is simply necessary to twist or rotate sleeve member 14 with respect to handle portion 12 so that the lugs 44 and 46 become aligned with the slot 32. The sleeve member may then be slid longitudinally away from handle portion 12 so that the end portion 50 of the sleeve member extends beyond the end 48 of inner tube 16, as illustrated in FIG. 2. The sleeve member 14 may be releasably locked in this position by engaging the lug 44 in opening or notch 36. With the parts in this position, blood is sucked in through the openings 58 into the annular space 42 and then through the openings 54 and 56 of inner tube 16 and then to the source of suction through bores 30 and 28 and flexible tubing 62. Of course, with the parts in the gross suctioning position of FIG. 2, some blood will be sucked in through end opening 52 as well. The integral, inwardly extending ribs 60 at the end of sleeve member 14 function to maintain inner tube 16 properly centered within the sleeve member when the parts are in the position illustrated in FIG. 2. At the same time, these ribs are guide means and function to guide the inner tube 16 through opening 52 when the parts are moved to the fine suctioning position illustrated in FIG. 1.

Since the device 10 is constructed of only three parts, all of which readily lend themselves to plastic molding, it follows that the device 10 is extremely simple and inexpensive to manufacture and assemble. This enables the device to be disposed of after each usage, thus eliminating the time and expense now involved in properly cleaning presently existing suction tubes of this type. Also, since the unit 10 is constructed entirely of plastic, it is relatively light in weight and hence easy to manipulate during use.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the parts may be made without departing from the spirit and scope of the underlying inventive concept and that the same is not limited to the particular forms herein shown and described except insofar as indicated by the scope of the appended claims.

What is claimed is:

1. An abdominal suction tube comprising a handle portion having a bore extending therethrough, an inner tube connected to said handle portion so that the bore of the latter is in alignment and communication with the bore of the former, said inner tube having at least one aperture closely adjacent to its free end but otherwise being imperforate, an open-ended sleeve member connected to said handle portion and extending therefrom so as to concentrically surround said inner tube, means releasably securing said sleeve member to said handle portion in a first position wherein the free end of said inner tube extends substantially beyond the adjacent end of said sleeve member so as to completely expose all of the aforesaid apertures in said inner tube, said sleeve member being movable to a second position wherein it extends beyond said inner tube, means releasably securing said sleeve member to said handle portion in said second position, the outer diameter of said inner tube being less than the inner diameter of said sleeve member so as to provide an annular space therebetween, at least at the area adjacent the free ends thereof, said sleeve member having a plurality of openings extending therethrough into communication with said annular space, said openings covering a substantial part of the length of said sleeve member starting at the free end thereof.

2. In the abdominal suction tube of claim 1 said handle portion being of tubular configuration and concentrically

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surrounding said inner tube so as to define an annular channel therebetween, said sleeve member being slidably received within said annular channel.

3. In the abdominal suction tube of claim 2, said releasable securing means comprising an outwardly extending lug on said sleeve member and a slot in said handle portion receiving said lug. 5

4. In the abdominal suction tube of claim 3, said releasable securing means comprising a pair of spaced notches communicating with said slot, at least the entrance portion of said notches being slightly narrower than the width of said lug, whereby said lug is frictionally held within whichever notch it is moved. 10

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