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(54) Sleeve for a medical endoscope

Hülse für ein medizinisches Endoskop

Enveloppe pour endoscope médical

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Description

TECHNICAL FIELD

[0001] The present invention relates to devices useful for removing unwanted materials such as calculi, deposits and tissues from a body cavity.

BACKGROUND INFORMATION

[0002] Currently, urologists performing a procedure known as percutaneous nephrolithotomy (PCNL) often use a rigid nephroscope, a flexible cystoscope, or a flexible ureteroscope in conjunction with flexible baskets or graspers to remove stones and stone fragments from the renal cavity of a patient. A rigid or semi-rigid scope is often used to treat the lower urinary tract, while accessing upper urinary tract needs a flexible scope for negotiating the tortuosity when the ureter crosses the iliac vessels. Because of the high degree of deflexibility required for.a scope to travel to the upper urinary tract, in terms of both active and passive deflection, adding accessories to the working channels of a flexible ureteroscope, which compromises the scope's overall deflexibility, is often undesirable. See, Smith's Textbook of Endourology, Vol. 1, Ch. 32 (1996, Quality Med. Pub. Inc.).

[0003] To remove stones and/or stone fragments, urologists generally use an endoscope coupled with accessories such as baskets or graspers. The use of accessories in the working channels of the endoscope becomes problematic when it comes to treating upper urinary tract because of added constraints on the scope's deflexibility and hence access to the target. Also, using a basket or grasper through a flexible scope can be technically challenging due to the high level of manual dexterity required of an operator to manipulate effectively the basket or grasper to capture and retrieve the stone (s) and/or stone fragment(s). Procedures that use baskets or graspers also are time-consuming since the entire scope must be retracted to remove stone(s) or fragment (s) from the renal cavity. If there are multiple stone(s) or fragment(s) to be removed from a specific area, then every time a flexible scope is retracted, the urologist must maneuver his/her way back to the desired location to get the next stone or fragment. This obviously increases the level of tissue trauma to the patient and the risk of damage to the urinary tract.

[0004] Urologists also use lithotripters to crush stones into fragments that are passable through the urinary tract. Lithotripsy devices have been developed which utilize electrohydraulic probes, ultrasonic probes, electromechanical impactors, laser fibers and so on. An example of a lithotripter is a system known as "Lithoclast" that is commercially available from Boston Scientific Corporation of Natick, Massachusetts. Again, the addition of a lithotripter will compromise the scope's deflexibility and thus will limit its use in treating the upper urinary tract. Such limitation also affects the breaking power of a lithotripter and renders treatment of upper urinary tracts longer and less successful.

[0005] Suction channels, sometimes with a lithotripter in a parallel working channel, have been integrated into scopes to help remove stones and fragments. For instance, a suction system known as "Lithovac," also available from Boston Scientific Corporation of Natick, MA, can be matched with the "Lithoclast" lithotripter system to remove stones and/or stone fragments from the renal cavity of a patient during a PCNL procedure. Because an integrated suction channel will further decrease the deflexibility of a flexible scope, the use of lithotripters with integrated suction is limited to renal areas that can be accessed by a rigid device. And even in such cases, the suction channel is often highly limited in its diameter and hence the suction capacity.

[0006] US 5637 075 relates to apparatus for observing inside of a body cavity. The document discloses an apparatus for optically observing a body cavity in which the view field is made more clear by eliminating mucus in the body cavity. The apparatus includes a tubular fluid passage forming member which surrounds an insert part and which is inserted into a body cavity. A space between the fluid passage forming member and the outer face of the insert part is divided into a fluid supply space and discharge space. An interface between the adapter and the insertion part is sealed with an O-ring to prevent supplied water from leaking.

[0007] US 5779 624 (Boston Scientific Corp.) relates to a sigmoid splint device for endoscopy. The document discloses an over tube device for use in keeping the sigmoid colon in a straightened position during endoscopy to facilitate advancement of the colonoscope or other types of medical endoscopes into the cecum. A proximal seal guides the endoscope through the splint and prevents loss of fluid from inside the splint.

[0008] US 4779611 relates to a disposable surgical scope guide. The document discloses a scope guide that includes an elongated hollow tube having opposite inner and outer ends, and a transparent inflatable balloon secured to the inner end of the tube. The outer end of the tube is sealable and is adapted to slideably receive a scope device which extends through the tube and into the balloon. A port is located on the tube to provide a connection to an air supply line. The sealing is accomplished with a self-sealing membrane.

SUMMARY OF THE INVENTION

[0009] An object of the present invention is thus to provide an effective and efficient means for the removal of stones and other unwanted materials from cavities only accessible by a flexible endoscope, such as the upper urinary tract. A more general objective is to provide a suction means that can remove large targets and be suitable for treatment of all cavities in the body including those accessible by rigid instruments.

[0010] The present invention provides devices as de-

fined in the appended claims for the removal of unwanted materials such as calculi, deposits, tissues (e.g., polyps and tumor cells) and fluid from a patient's (human or animal) body cavity. The invention achieves these objectives by providing a sleeve that is to be placed over an elongated instrument such as a flexible endoscope. The sleeve wall contains a port disposed between the distal opening and proximal opening; the port divides the lumen into a distal lumen and a proximal lumen. When the distal end of the inserted instrument is retracted beyond the port, a seal prevents direct passage of gas or liquid between the sleeve's proximal opening and the port. Hence, a passageway is created between the sleeve's distal opening and the port, and through a portion of the sleeve lumen. When the port is connected to a vacuum source, materials from a treatment site can be removed through the suction passageway. When the port is connected to a source of positive pressure (liquid or gas), it results in irrigation or ventilation of the treatment site through the sleeve's passageway.

[0011] Because the passageway so created may have a cross-section as large as the entire cross-section of the sleeve, effective removal of large targets becomes possible. This maximization in the cross-section of the passageway offers a significant advantage over the removal capacity of known suction lumens that are integrated in a rigid, semi-rigid or flexible endoscope. Particularly for treatment of upper urinary tracts where scope deflexibility is crucial, the invention provides the possibility for a flexible scope containing a lithotripter in its working channels to also possess a suction function. The device of the invention also eliminates the need for using flexible forceps and flexible baskets through the working channels of flexible scopes, an operatively difficult and inefficient procedure for treating upper urinary tracts.

[0012] The time required to remove stones and their fragments is also substantially reduced with the excellent suction capability of the device of the invention. Because the sleeve remains positioned inside the body cavity, an operator can reinsert the instrument to the earlier position through the guidance of the sleeve. This saves the operator from re-performing the often time-consuming and technically-demanding procedure of maneuvering the medical instrument inside a body cavity such as the tortuous renal cavity. This also saves the patient from further discomfort and tissue trauma.

[0013] The sleeve is designed to receive an elongated medical instrument such as a scope and more particularly, a flexible scope such as a flexible cystoscope or a flexible ureteroscope. Therefore, the sleeve can take any shape to accommodate the shape of the instrument, and different segments of the sleeve may assume different shapes. The preferred shape of the sleeve is substantially cylindrical where a cross-section of the sleeve is substantially circular or oval. In a preferred embodiment, the port is connected to a vacuum pump. When the instrument is slid back until its distal end is proximal to the suction port, the space inside the sleeve previously occupied by the instrument becomes a suction passageway. Suction in the distal lumen is made possible by the presence of a seal in the sleeve's proximal lumen. The seal may be in the form of an interference fit between the sleeve member and the instrument (e.g. around its radial surface).

[0014] The sleeve can have multiple lumens. Such lumens may be defined by a permanent partition integral with the sleeve, or by temporary structures that may be separated from the sleeve, or it may be created by the insertion of an instrument whose outer diameter is less then the inner diameter of the sleeve. At least one of these lumens may be connected to an aperture and serve as a channel for suction, irrigation or ventilation even when the distal end of the instrument is in the distal lumen. This aperture can be the same port that divides the sleeve lumen into the distal lumen and the proximal lumen. Alternatively, this aperture can be a separate opening.

[0015] The sleeve may be used to provide concurrent irrigation to the treatment site. This will prevent collapse of the renal cavity during suction by providing enough fluid flow to the renal cavity to counteract the suction force pulling material and fluid out of the renal cavity. A separate irrigation channel can also be integrated into the sleeve.

[0016] In some embodiments of the invention, the sleeve and the instrument are integrated into one unit. In other embodiments of the invention, the sleeve and the instrument are separable and the sleeve becomes disposable after use. This allows it to be manufactured inexpensively and does not require the operator to purchase any additional instrumentation in order to use the sleeve.

[0017] The wall forming the sleeve lumen may be made of flexible material. In a preferred embodiment where the sleeve is to enclose a flexible scope used for treating the upper urinary tract, the sleeve is made of flexible materials. As a result, the sleeve will not significantly impact the deflection capabilities of the flexible scope. In addition, the inner and/or outer surface of the sleeve may be coated partially or completely with a lubricious material to further reduce any impact on the deflexibility of the scope, allowing easy positioning and maneuvering around the renal cavity. In another embodiment, on the other hand, there may be structures such as reinforcement materials in the sleeve that prevents the sleeve from ovaling, kinking, or collapsing as a result of bending, manipulation, or suctioning of stone(s) or fragment(s).

[0018] The sleeve has a seal preventing direct passage of fluid between the port and the proximal opening, the seal comprising a compressive clamp that tightens around the radial surface of the enclosed instrument that prevents the direct passage of fluid between the port and the proximal opening of the sleeve. An example of the seal is an airtight connection with a portion of the enclosed instrument when the instrument is pulled back beyond the port. When the port is connected to a vacuum

source, this scal in that segment of the sleeve allows the formation of a suction passageway from the sleeve's distal opening to the suction port. This seal may continue to prevent the direct passage of gas or liquid between the proximal opening and the port even when the distal end of the instrument is distal to the suction port. The seal comprises a locked position and an unlocked position.

[0019] The port is connected to a source of pressurized fluid (gas or liquid), such as a pump. The source may generate negative pressure that causes suction, or it may generate positive pressure to inject fluid (such as saline solution or air). A switch, such as a trumpet valve assembly, may be used to switch the port between the suction mode and the injection mode. The port may be further connected to an on/off switch, and/or a pressure-regulator.

[0020] The foregoing and other objects, aspects, features, and advantages of the invention will become more apparent from the following description, figures, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] In the drawings, like reference characters generally refer to the same parts throughout the different views. Also, the drawings are not necessarily to scale, emphasis instead generally being placed upon illustrating the principles of the invention.

FIG. 1 is a side view of an embodiment of the invention.

FIG. 2 is a further illustration of the embodiment depicted in FIG. 1.

FIGS. 3A-3B are cross-section views, taken along line b-b in FIG. 2, showing the lumens of various embodiments of the sleeve.

FIG. 3C is a cross-section view, taken along line a-a in FIG. 1, showing the lumen of an embodiment of the sleeve with an instrument inside.

FIG. 4A is a prospective view of an embodiment of the seal in accordance with the invention.

FIG. 4B is a schematic view of an embodiment of a seal outside the scope of the invention.

DETAILED DESCRIPTION

[0022] Reference is now made to the drawings which are presented merely for the purpose of illustrating the general principles of the invention.

[0023] Referring to FIG. 1, an embodiment of the sleeve in accordance with the present invention comprises a tubular member **10** that is designed to be placed over an elongated instrument **50,** such as a scope as illustrated here. The tubular member **10** has a distal opening **15** and a proximal opening **25** and a third radial opening **20.** Opening **20** is a port connected to a source of pressurized fluid (not shown). The port **20** divides the lumen of the sleeve into two segments: the proximal lumen **30** between the proximal opening **25** and the port **20,** and the distal lumen **5** between the distal opening **15** and the port **20.** The sleeve further comprises a seal **40** that prevents direct passage of gas or liquid between the proximal opening **25** and the port **20.** In one mode as illustrated in FIG. 1, the elongated instrument **50** is inserted all the way inside the sleeve and performs its intended functions. In the case of an endoscope, once its distal end **52** is inserted into the distal region of the sleeve, it can be used to carry out diagnostic and therapeutic functions. In this mode, the sleeve **10** is a protective cover or sheath and provides sterility and insulation.

[0024] In FIG. 2, the same embodiment of the invention is shown in a different mode. Here, the inserted instrument **50** is pulled back in the sleeve **10.** When the distal end **52** of the instrument **50** is disposed proximal to the port **20,** the seal **40** prevents the direct passage of gas or liquid between the proximal opening **25** and the port **20.** In this particular illustration, the seal **40** comprises a ring clamp made of elastic steel that locks and exerts a compressive force on a portion of the instrument **50's** radial surface. Once the clamp **40** is locked, it provides an interference fit between the proximal end of the sleeve **10** and a portion of the outer, radial surface of the inserted instrument **50.** Clamp **40** can also be in the locked position and seal off the proximal end of the sleeve **10** even when instrument **50** is fully inserted in the sleeve such that its distal end **52** is distal to port **20.** If this is the case, and if the port **20** is connected to a vacuum source, any space in the sleeve **10** not occupied by instrument **50** will become a suction lumen when the distal end **52** is in the distal lumen **5.** In any event, when the instrument is partially retracted such that its distal end **52** is in the proximal lumen **30,** the entire distal lumen **5** becomes a passageway for materials to flow between the distal opening **15** and port **20.**

[0025] A major advantage of the present invention is the maximization in the cross section of the passageway which can be used for suction. The outer diameter of the sleeve **10** can be, in one embodiment, approximately 6mm (18 Fr) (0.236 inches) which will allow the device to travel through most infundibula. In one embodiment, the inner diameter of the sleeve is sized to allow suction and removal of stones and fragments up to 5mm in diameter when the distal end **52** of the scope is in the proximal lumen **30,** and up to 2mm in diameter when the distal end **52** is in the distal lumen **5.**

[0026] While in the preferred embodiment, the sleeve **10** is detachable from the instrument **50** and hence disposable, it shall be recognized that the invention further contemplates integrating the two into one unit. The sleeve and the instrument may contain structures such as corresponding grooves and protrusions to customarily fit each other and provide effective sealing at least when the distal end **52.** of the instrument is in the proximal lumen **30.**

[0027] The wall forming the sleeve lumen may be

made of a : flexible material. The sleeve can be manufactured through thermoplastic extrusion or injection molding. In a preferred embodiment where the sleeve is to enclose a flexible scope in treating the upper urinary tract, the sleeve is made of a flexible material, preferably of extrudable plastic materials, such as polyurethane, polyethylene, polyethylene teraphthalate, and/or polyvinyl chloride. As a result, the sleeve will not significantly impact the deflection capabilities of the flexible scope, and the scope **50** is able to achieve a deflection of about 120 to 150 degrees with the sleeve **10** over the scope.

[0028] In some embodiments of the invention, the sleeve is constructed in such a manner, as recognized by those skilled in the art, to prevent ovaling, kinking, or collapse as a result of bending, manipulation, or suctioning of stones or their fragments. One example is to add reinforcing materials in the form of wires or an intermediate layer in the lumen wall of the sleeve **10**. Another example is to insert support rings, inflatable tubes, helical members and other structures such as described in U.S. Patent No. 6,017,339 to Sadamasa, U.S. Patent No. 5,569,219 to Hakki et al. and U.S. Patent No. 5,947,940 to Beisel,In a preferred embodiment, the sleeve is passively deflected since it relies on the use of a flexible scope for positioning within the renal cavity, that is, the sleeve is flexible and bends or deflects as an operator controllably bends and deflects the scope.

[0029] In one aspect of the invention, the inner and/or outer diameters of the sleeve **10** may be coated partially or completely with lubricious materials to allow easy positioning and maneuvering around the renal cavity. Such coating(s) may also help offset any impact on the deflexibility of the flexible scope due to the durometer of the sleeve.

[0030] In another aspect of the invention, the sleeve may contain multiple lumens defined by partition structures. Apertures connected to these lumens may be part of the sleeve's distal opening, proximal opening, or its radial surface. As shown in FIG. 3A, the sleeve **10** may contain, for example, three lumens defined by partition structure **6**. Lumen **1** is sized for insertion of the medical instrument (not shown). One of the lumens can be used as an irrigation or ventilation channel **3** connected to a source of pressurized fluid. Lumen **2** illustrates another working channel.

[0031] The lumens can be substantially co-axial, as shown in FIG. 3B. All or one of the outer lumens may be used as the irrigation/ventilation channel **3** connected through an aperture (not shown) to a source of irrigation or ventilation. That aperture may be the port **20.** The channel **3** can run along the length of the sleeve **10,** which prevents the collapse of the cavity under treatment during suction by providing enough fluid flow to the cavity to counteract the vacuum caused by suction.

[0032] Referring to FIG. 3C, when the outer diameter of the instrument **50** is less than the inner diameter of the sleeve **10,** a lumen **8** is created by virtue of space in the sleeve unoccupied by the instrument. Lumen **8** can be connected, through an aperture in the sleeve's proximal end or in the sleeve's radial surface, to a source of pressurized fluid and be used as an irrigation or ventilation channel. Lumen **8** may also be connected to the port **20,** and serve as a suction passageway when the distal end of the instrument **50** is in the distal lumen and the port **20** is connected to a vacuum source. A continuous low-pressure flow may be supplied through lumen **8** to remove stones or fragments while the instrument **50** operates. Furthermore, since the port **20** may be further connected to a source of positive pressure and be used to inject fluids or gases to the treatment site (described below), lumen **8** may be used as an irrigation or ventilation channel in that manner.

[0033] In one aspect, the seal **40** can assume many different structures and configurations. As depicted in FIGS. 1 and 2, and in more detail in FIG. 4A, the seal 40 can be a compressive clamp or an O-ring made of steel. Referring to FIG. 4A, an embodiment of the clamp in accordance with the invention is in the shape of a bracelet that is to be placed over the proximal portion of the sleeve (not shown). The clamp may include two arms **41,** connected by a hinge **48.** The two arms **41** lock through two tooth-like structures **43,** which are complementary in shape and will lock when an operator squeezes them together and past each other. There are small knob-like protrusions **46** fixed on structures **43.** The operator can unlock structures **43** by pushing the two knobs **46** outward simultaneously. There can be additional structures attached inside the arms 41 where contact with the sleeve is made. An example of such additional structures is a pad made of materials such as plastics, rubber, leather or sponge. When the operator locks the clamp around the proximal portion of the sleeve, the clamp tightens the sleeve and provides an interference fit between the sleeve and the medical instrument inside. The option of having other structures between the sleeve and the instrument is not contemplated as negating the existence of an interference fit. Other devices outside the scope of the invention are known to one skilled in the mechanical art and can be used to seal off the sleeve's proximal opening against the enclosed instrument, such as rubber bands and devices described in U.S. Patent No. 5,775,325 to Russo.

[0034] Referring to FIG. 4B, in an embodiment outside the scope of the invention, the seal **40** can comprise a portion of the inner surface of the sleeve itself that protrudes inward as a constrictor. This ring of protrusion **40** between the proximal opening **25** and the port **20** can be made of the same material and be integral to the sleeve or of a different material that has a higher or lower durometer. The size of constrictor **40** is designed to provide an interference fit between the sleeve's inner surface and the inserted instrument. Alternatively, the constricting ring may be disposed on the outer surface of the sleeve and exert inward radial forces on the sleeve that compress the inner surface tightly against the surface of the instrument. The constricting ring may reside in a groove

carved on the outer surface of the sleeve.

[0035] If the inner diameter of the sleeve and the outer diameter of the instrument are substantially the same and therefore the instrument is force-fitted into the sleeve, then the seal **40** comprises portions of the sleeve's inner surface and the instrument's outer radial surface that are in contact with each other.

[0036] Referring back to FIGS. 3A and 3B, in certain embodiments, such as those depicted here, where there are lumens other than lumen 1, which is for insertion of the instrument **50,** the seal **40** (not shown) may or may not seal off those lumens. Therefore, the irrigation or ventilation channel **3,** for example, may continue to transport fluids to the treatment site, when the seal **40** seals off the proximal end of lumen 1. The route where fluids travel from the sleeve's proximal opening, through an irrigation or ventilation channel, to the sleeve's distal opening and then to the port **20** is not contemplated as a "direct" passage of fluids between the proximal opening and the port.

[0037] The port **20** is connected to a source of pressurized fluid, such as a pump. In one aspect of the invention, the source may generate either negative pressure to cause suction or positive pressure to inject fluid or air to the site of treatment. Alternatively, the source of positive pressure (e.g., for irrigation or ventilation) may be separate from the source of negative pressure (e.g., a vacuum pump) and the port may be linked to both. In that case, the port may be further connected to a device allowing the operator to switch from one connection to the other. An example of such a device is a trumpet valve assembly, described in U.S. Patent No. 5,449,145 to Wortrich.

[0038] A source of pressurized gas or liquid such as a gravity-based drip-irrigation system is contemplated by the present invention as a source of positive pressure. In any event, the seal **40** prevents direct passage of gas or liquid between the port and the sleeve's proximal opening.

[0039] Whether the suction port is linked to a source of positive pressure, negative pressure or both, the suction port may be further connected to a switch or valve that turns the pressure on and off (e.g. a trumpet valve), and/or a pressure-regulator. Examples of such control devices are described in publications such as U.S. Patent Nos. 5,882,348 to Winterton et al., 5,938,589 to Wako et al., and 5,730,727 to Russo.

[0040] A further aspect of the invention addresses the risk of scope damage from stones and their fragments hitting the lens at the distal end of the scope inverted in the sleeve. A separate soft bumper, mesh, or other like barrier structure can be attached to the distal end of the scope for lens protection. A stream of irrigating fluid will also cushion the scope against the impact of stones and their fragments. The irrigation will also help clean the lens for better viewing.

[0041] Different embodiments and various features of the invention can be combined in the same device in accordance with the invention as defined in the appended claims.

Claims

1. A medical device sleeve, comprising:

an elongated flexible tubular member (10) defining a distal opening (15), a proximal opening (25), and a lumen extending from the distal opening to the proximal opening, the tubular member for receiving a scope within the lumen through at least the proximal opening, the tubular member being configured to allow passage of materials from a treatment site through at least a portion of then tubular member;
a port (20) disposed between the distal opening and the proximal opening dividing the lumen into a distal lumen (5) and a proximal lumen (30), thereby defining a passageway extending from the distal opening (15), through the distal lumen, and to the port (20), the port (20) for connection at least to a vacuum source; and
a seal (40) preventing direct passage of fluid between the port and the proximal opening, said seal comprising a compressive clamp that can be locked into a position that provides an interference fit between the proximal end of the tubular member and a radial surface of the scope and can be unlocked from the said position.

2. The sleeve of claim 1, wherein the port (20) is also connected to a source of positive pressure.

3. The sleeve of claim 2, wherein the port (20) is further connected to a selector allowing selection between the connection to the vacuum source or to the source of positive pressure.

4. The sleeve of claim 1, wherein the port (20) is further connected to a pressure regulator.

5. The sleeve of claim 1, wherein the port (20) is further connected to an on/off switch.

6. The sleeve of claim 5, wherein the switch comprises a trumpet valve.

7. The sleeve of claim 1, further comprising partitions defining multiple lumens (1, 2, 3).

8. The sleeve of claim 7 wherein at least one lumen (3) is connected to a source of pressurized fluid.

9. The sleeve of claim 1, wherein the lumen is defined by a wall comprising a flexible material.

10. The sleeve of claim 1, wherein the lumen is defined

by a wall comprising a reinforcing material.

11. The sleeve of claim 1, wherein the lumen is defined by a wall coated with a lubricant.

12. The sleeve of claim 1, wherein the clamp comprises a ring.

13. The sleeve of claim 12, wherein the clamp is made of elastic steel.

14. The sleeve of claim 1, wherein suction can be applied in the entire distal lumen (5) when the clamp is locked.

15. The sleeve of claim 1, wherein the inner diameter of the sleeve is sized to allow suction and removal of stones and fragments up to 5 mm in diameter.

16. The medical device sleeve of claim 1, wherein the medical device sleeve is disposable.

17. A medical device according to claim 1, wherein said scope is an endoscope (50).

18. The medical device of claim 17, wherein the endoscope (50) is a ureteroscope.

19. The medical device of claim 17, further comprising a lithotripter.

Patentansprüche

1. Hülse für eine medizinische Vorrichtung mit:

einem verlängerten, flexiblen röhrenförmigen Teil (10), das eine distale Öffnung (15) bestimmt, einer proximalen Öffnung (25) und einem Lumen, der sich von der distalen Öffnung bis zu der proximalen Öffnung erstreckt, wobei das röhrenförmige Teil dazu dient, ein Skop innerhalb des Lumens über mindestens die proximale Öffnung aufzunehmen, und wobei das röhrenförmige Teil ausgestaltet ist, einen Durchfluss von Materialien von dem Ort der Behandlung zu mindestens einem Bereich des röhrenförmigen Teils zu erlauben,
einem Anschluss (20), der zwischen der distalen Öffnung und der proximalen Öffnung angeordnet ist, die das Lumen in ein distales Lumen (5) und ein proximales Lumen (30) unterteilen, wodurch ein Durchgang bestimmt wird, der sich von der distalen Öffnung (15) über das distale Lumen zu dem Anschluss (20) erstreckt, wobei der Anschluss (20) zur Verbindung mindestens eine Vakuumquelle aufweist, und
einer Dichtung (40), die einen direkte Durchfluss einer Flüssigkeit zwischen dem Anschluss und der proximalen Öffnung verhindert, wobei die Dichtung eine zusammendrückende Klemme aufweist, die in eine Stellung festgestellt werden kann, die eine Presspassung zwischen dem proximalen Ende des röhrenförmigen Teils und einer radialen Oberfläche des Skops bereit stellt und die aus dieser Stellung freigegeben werden kann.

2. Hülse nach Anspruch 1, wobei der Anschluss (20) auch mit einer Quelle positiven Drucks verbunden ist.

3. Hülse nach Anspruch 2, wobei der Anschluss (20) ferner mit einer Auswahlvorrichtung verbunden ist, die eine Auswahl zwischen der Verbindung mit der Vakuumquelle oder der Quelle positiven Drucks ermöglicht.

4. Hülse nach Anspruch 1, wobei der Anschluss (20) ferner mit einer Druckregelvorrichtung verbunden ist.

5. Hülse nach Anspruch 1, wobei der Anschluss (20) ferner mit einem Ein- /AusSchalter verbunden ist.

6. Hülse nach Anspruch 5, wobei der Schalter ein Trompetenventil aufweist.

7. Hülse nach Anspruch 1, die ferner Aufteilungen aufweist, die mehrere Lumen bestimmen.

8. Hülse nach Anspruch 7, wobei mindestens ein Lumen (3) mit einer Quelle einer unter Druck stehenden Flüssigkeit verbunden ist.

9. Hülse nach Anspruch 1, wobei das Lumen durch eine Wand bestimmt ist, die ein flexibles Material enthält.

10. Hülse nach Anspruch 1, wobei das Lumen durch eine Wand bestimmt ist, die ein Material mit Verstärkung enthält.

11. Hülse nach Anspruch 1, wobei das Lumen durch eine Wand bestimmt ist, die mit einem Schmiermittel beschichtet ist.

12. Hülse nach Anspruch 1, wobei die Klemme einen Ring aufweist.

13. Hülse nach Anspruch 12, wobei die Klemme aus einem elastischen Stahl gefertigt ist.

14. Hülse nach Anspruch 1, wobei das Saugen in dem gesamten distalen Lumen (5) angelegt werden kann, wenn die Klemme geschlossen ist.

15. Hülse nach Anspruch 1, wobei der innere Durchmesser der Hülse in einer Größe zur Ermöglichung des Saugens und zur Entfernung von Steinen und von Fragmenten von bis zu 5 mm Durchmesser ausgestaltet ist.

16. Hülse für eine medizinische Vorrichtung nach Anspruch 1, wobei die Hülse für eine medizinische Vorrichtung ein Einwegartikel ist.

17. Hülse für eine medizinische Vorrichtung nach Anspruch 1, wobei das Skop ein Endoskop (50) ist.

18. Hülse für eine medizinische Vorrichtung nach Anspruch 17, wobei das Endoskop (50) eine Ureteroskop ist.

19. Hülse für eine medizinische Vorrichtung nach Anspruch 17, die ferner einen Nierensteinzertrümmerer aufweist.

Revendications

1. Manchon de dispositif médical, comprenant :

un élément tubulaire flexible allongé (10) définissant une ouverture distale (15), une ouverture proximale (25) et une lumière s'étendant de l'ouverture distale à l'ouverture proximale, l'élément tubulaire étant destiné à recevoir un dispositif de mesure à l'intérieur de la lumière à travers au moins l'ouverture proximale, l'élément tubulaire étant configuré pour permettre le passage de matières depuis un site de traitement à travers au moins une partie de l'élément tubulaire :

un orifice (20) disposé entre l'ouverture distale et l'ouverture proximale divisant la lumière en une lumière distale (5) et une lumière proximale (30), définissant ainsi un passage s'étendant à partir de l'ouverture distale (15), à travers la lumière distale, et vers l'orifice (20), l'orifice (20) pour liaison au moins à une source de vide ; et un joint (40) empêchant le passage direct de fluide entre l'orifice et l'ouverture proximale, ledit joint comprenant un collier compressif qui peut être bloqué dans une position qui assure un ajustement serré entre l'extrémité proximale de l'élément tubulaire et une surface radiale du dispositif de mesure et peut être débloqué de ladite position.

2. Manchon selon la revendication 1, dans lequel l'orifice (20) est également relié à une source de pression positive.

3. Manchon selon la revendication 2, dans lequel l'orifice (20) est en outre relié à un sélecteur permettant la sélection entre la liaison à la source de vide ou à la source de pression positive.

4. Manchon selon la revendication 1, dans lequel l'orifice (20) est en outre relié à un régulateur de pression.

5. Manchon selon la revendication 1, dans lequel l'orifice (20) est en outre relié à un interrupteur marche/arrêt.

6. Manchon selon la revendication 5, dans lequel l'interrupteur comprend un clapet en trompette.

7. Manchon selon la revendication 1, comprenant en outre des cloisons définissant de multiples lumières (1, 2, 3).

8. Manchon selon la revendication 7, dans lequel une lumière (3) est reliée à une source de fluide pressurisé.

9. Manchon selon la revendication 1, dans lequel la lumière est définie par une paroi comprenant un matériau souple.

10. Manchon selon la revendication 1, dans lequel la lumière est définie par une paroi comprenant un matériau de renfort.

11. Manchon selon la revendication 1, dans lequel la lumière est définie par une paroi enduite d'un lubrifiant.

12. Manchon selon la revendication 1, dans lequel le collier comprend une bague.

13. Manchon selon la revendication 12, dans lequel le collier est constitué d'acier élastique.

14. Manchon selon la revendication 1, dans lequel une aspiration peut être appliquée dans l'ensemble de la lumière distale (5) lorsque le collier est bloqué.

15. Manchon selon la revendication 1, dans lequel le diamètre interne du manchon est dimensionné pour permettre l'aspiration et l'élimination de calculs et fragments pouvant aller jusqu'à 5 mm de diamètre.

16. Manchon de dispositif médical selon la revendication 1, dans lequel le dispositif médical est jetable.

17. Dispositif médical selon la revendication 1, dans lequel ledit dispositif de mesure est un endoscope (50).

18. Dispositif médical selon la revendication 17, dans lequel l'endoscope (50) est un urétéroscope.

19. Dispositif médical selon la revendication 17, comprenant en outre un lithotriteur.

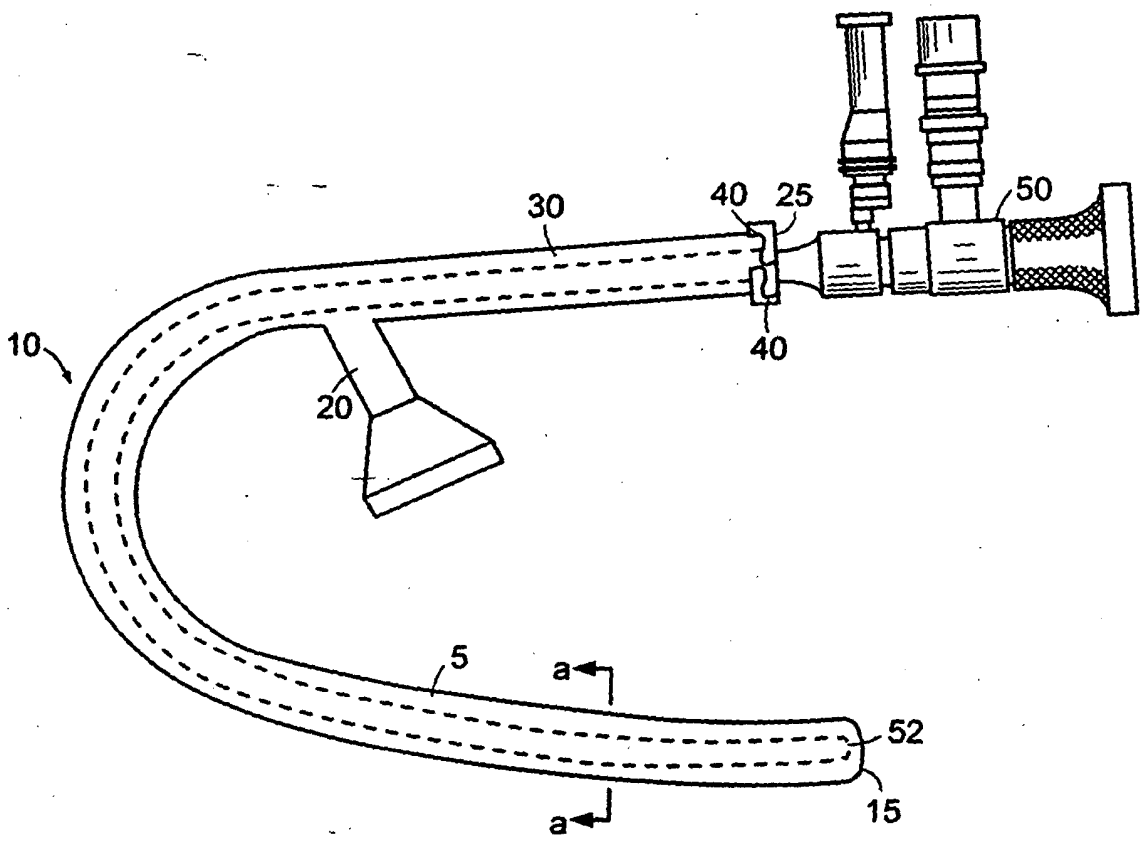

FIG. 1

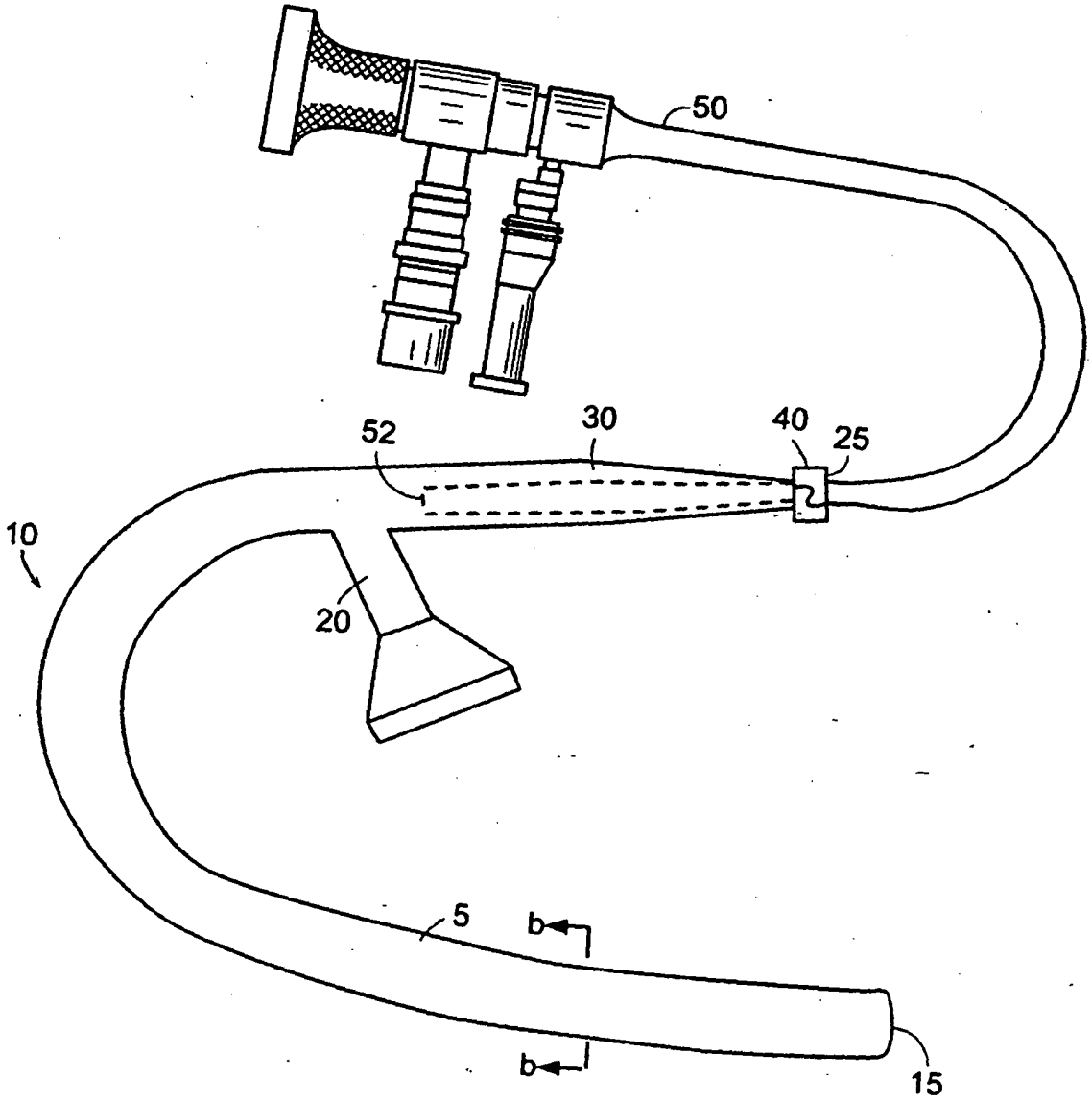

FIG. 2

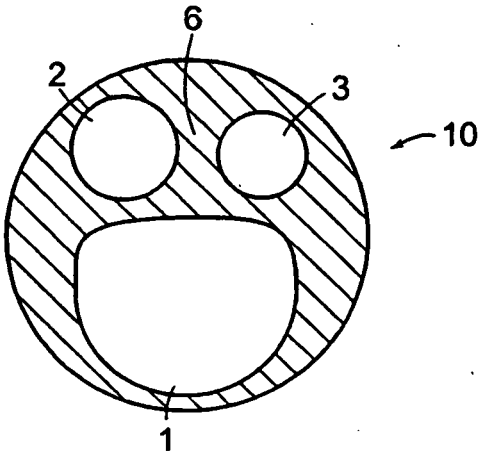

FIG. 3A

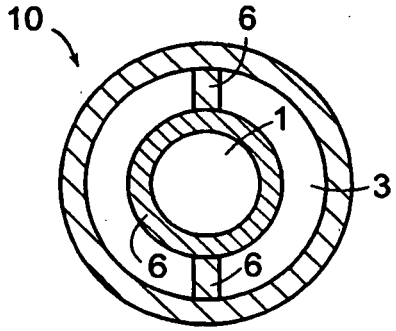

FIG. 3B

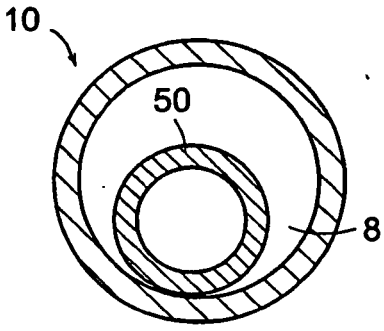

FIG. 3C

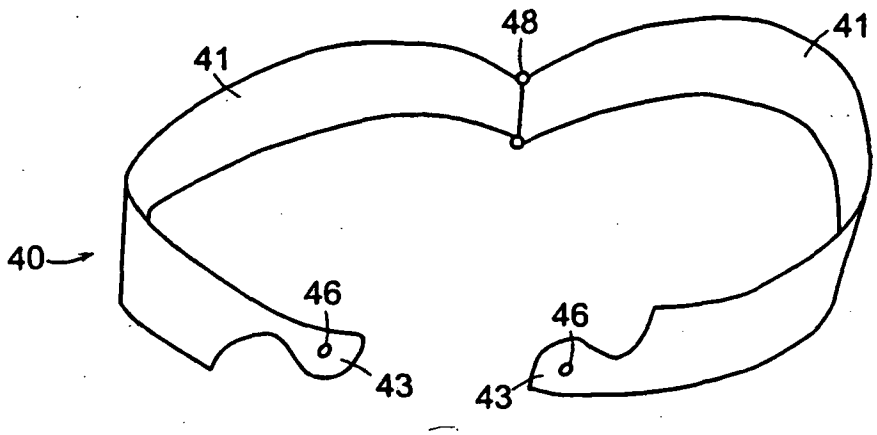

FIG. 4A

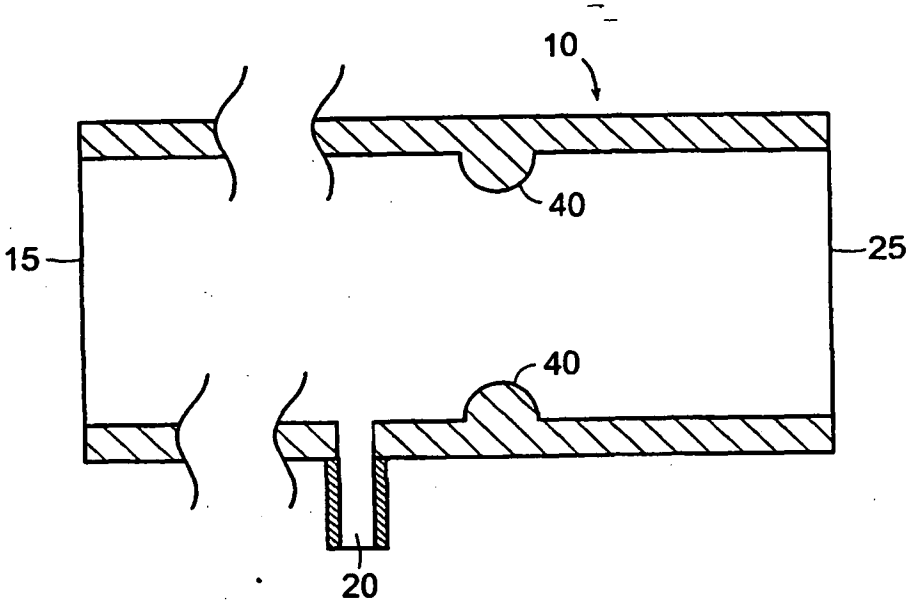

FIG. 4B

REFERENCES CITED IN THE DESCRIPTION

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专利名称(译)	用于医疗内窥镜的套管		
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当前申请(专利权)人(译)	BOSTON SCIENTIFIC LIMITED		
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摘要(译)

提供套管（10）用于放置在柔性内窥镜（50）上。套管（10）在其远端（15）和近端开口（25）之间具有端口（20），并且端口（20）连接到真空源。一旦内窥镜（50）在吸入口（20）的近侧缩回，套管的近端开口（25）就被密封，整个套管变成吸入腔。根据本发明的装置和方法提供了从体腔移除材料的改进，尤其是从上泌尿道移除结石。

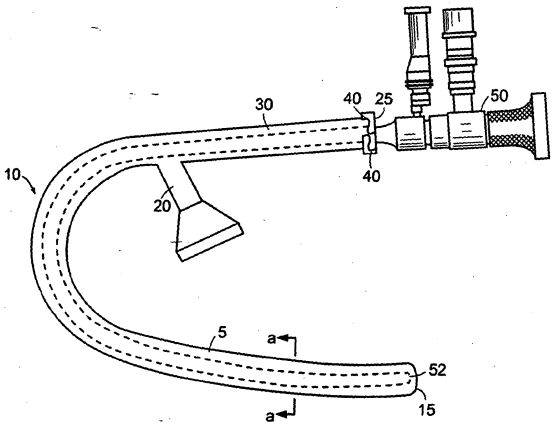

FIG. 1