



(11) **EP 2 793 718 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:

21.02.2018 Bulletin 2018/08

(21) Application number: **12816293.0**

(22) Date of filing: **21.12.2012**

(51) Int Cl.:

A61B 17/34 ^(2006.01)

(86) International application number:

PCT/EP2012/076857

(87) International publication number:

WO 2013/093107 (27.06.2013 Gazette 2013/26)

(54) **LAPAROSCOPIC SEAL BRIDGE**

BRÜCKE FÜR EINE LAPAROSKOPISCHE DICHTUNG

PONT DE JOINT D'ÉTANCHÉITÉ LAPAROSCOPIQUE

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **23.12.2011 US 201161579670 P**

(43) Date of publication of application:

29.10.2014 Bulletin 2014/44

(73) Proprietor: **EON Surgical Ltd.**

69710 Tel Aviv (IL)

(72) Inventors:

- **BACHAR, Yehuda**
5405108 Givat Shmuel (IL)
- **FARIN, Danny**
4527218 Hod Ha'Sharon (IL)

(74) Representative: **Jacob, Reuben Ellis**

Maucher Jenkins
26 Caxton Street
London SW1H 0RJ (GB)

(56) References cited:

WO-A1-2011/128392 WO-A2-2012/035524
US-A- 5 176 653 US-A- 5 392 766

EP 2 793 718 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

FIELD OF THE INVENTION

[0001] The present invention generally relates to systems for performing surgeries, and more specifically to devices for micro-laparoscopic surgeries.

BACKGROUND OF THE INVENTION

[0002] Laparoscopic or minimally invasive surgery includes the use of several relatively small ports into the abdomen by which different types of instrumentation and accessories are introduced and used for different surgical interventions (usually performed under endoscopic vision). Although usually considered superior in several aspects to open surgery, the use of a plurality of 5 to 15 mm ports still leads to local pain, scars, and possibly port related complications such as hernia in scars and the need for one or two assistants in addition to the surgeon.

[0003] In past years, new versions of laparoscopic systems and approaches were introduced to overcome several of the "classic" laparoscopy disadvantages, mainly the Single-Port Access (SPA) and the Needlescopy approaches. In SPA the surgeon operates almost exclusively through a single entry point, typically through the patient's navel, using access ports and hand instrument. Highly experienced and skilled physicians may still use standard laparoscopic hand instruments, although the use of a single port access decreases its triangulation and complicates maneuverability. The use of special-purpose articulating instrumentation was introduced to overcome this difficulty, although it is considered very expensive, necessitates special training and still involves complex surgical maneuverability.

[0004] "Minilaparoscopy" (also known as "needlescopic laparoscopy") is intended to overcome the problems encountered in single port access surgery. While the advantages of SPA include improved cosmetic, less abdominal wall pain and less incision related complications, this surgical approach has disadvantages. The vision is partially obscured by the paralleled inserted instruments; there is minimal triangulation and limited maneuverability of the surgical instruments. Minilaparoscopy maintains the same mode of surgery as standard laparoscopy however there is only one sheath and all the rest of the instruments are connected to needle-like shafts which are inserted with no trocar and therefore provide comparable cosmetic and painless results as SPA.

[0005] In needlescopy, the laparoscopic ports are replaced with small incisions, usually between 2 to 3 mm in diameter. The surgery is performed by inserting narrow guide tubes into the small incisions and then passing tiny instruments through the tubes, while using a small camera for guidance. The small instruments have very slender tips which make dissection and tissue maneuvering very difficult. Furthermore the instrument tips may have a greater tendency to break and their removal may be

cumbersome and difficult.

[0006] In order to avoid such difficulties while maintaining small incision porting, it has been advised to combine the single-port and the needlescopic approaches. This is achieved by first inserting regular-sized interchangeable end-effectors through a regular size single port access and then detachably attaching them to corresponding distal portions of needle-sized manipulators. The manipulators are protruding into abdomen cavity via miniature needlescopic type incisions. Locating and engaging between a needle manipulator and an end-effector inside the abdominal cavity may be risky and cumbersome, therefore the Inventors suggest that such engagement and connection will take place in a more secured location such as outside the abdominal cavity or even outside patient's body. Patent document US5392766 discloses a laparoscopic system with 2 tubes and a seal at the distal end. The invention is defined in claim 1. Further embodiments of the invention are defined in the dependent claims.

SUMMARY OF THE INVENTION

[0007] Accordingly, embodiments of the present invention preferably seek to mitigate, alleviate or eliminate one or more deficiencies, disadvantages or issues in the art, such as the above-identified, singly or in any combination by providing devices and methods according to the appended patent claims.

[0008] According to a first aspect, a system for passing an end portion of a needle system from a body cavity to an outer environment through a laparoscopic port is provided. The system comprises an elongated sleeve which comprises a second proximal opening, a second distal opening, a second lumen extending between the second proximal opening and the second distal opening, and a seal provided in the second lumen. The system further comprises a seal bridge which comprises an elongated body. The elongated sleeve is telescopically introducible at a first proximal end, through a first lumen and bypassing a seal mechanism of the laparoscopic port. The seal bridge is adapted to be inserted through the second proximal opening to be deployed in the second lumen and thereby bridging across and/or deactivating the seal of the elongated sleeve.

[0009] Deactivating means, in the context of the application, affecting the seal to be open to end portion as well as fluids etc passing therethrough.

[0010] Some examples of the system comprise a laparoscopic port.

[0011] In some examples of the system, the elongated body of the seal bridge comprises a third distal opening, a sealed proximal end and a third lumen extending at least partially therebetween.

[0012] In some examples of the system, the seal bridge is sealed to gas.

[0013] In some examples of the system, the elongated body has a proximal segment and distal segment, the

proximal segment has a larger outer diameter than the distal segment.

[0014] In some examples of the system, the third lumen is adapted to receive the end portion of the needle when the needle entering the second distal opening.

[0015] In some examples of the system, the second proximal opening is provided with a removable sealing covering.

[0016] In some examples of the system, the seal comprises a zero seal.

[0017] In some examples of the system, the seal comprises an instruments seal.

[0018] In some examples of the system, the third distal opening third distal opening has a beveled opening.

[0019] According to a further aspect a method for passing an end portion of a needle system from a body cavity to an outer environment is disclosed. The method comprises telescopically introducing an elongated sleeve in a lumen of a laparoscopic port through a first proximal opening, thereby bypassing a seal mechanism of the laparoscopic port. The method further comprises bridging across and/or deactivating a seal in the second lumen by inserting a seal bridge into a second lumen of the elongated sleeve, through a second proximal opening of the elongated sleeve and passing the end portion of the needle system into the second lumen via a second distal opening of the elongated sleeve. Moreover the method comprises positioning a portion of the needle across the seal, and removing the seal bridge.

[0020] In some examples, the method comprises positioning the portion of the needle across the seal by positioning the end portion of the needle system through a third distal opening of the seal bridge and into a third lumen of the seal bridge.

[0021] In some examples, the method comprises creating a beveled entry passage at the third opening, after deployment in said second lumen.

[0022] In some examples, the method comprises positioning the portion of the needle across the seal by a pushing force provided by the needle on a distal end portion of the seal bridge.

[0023] In some examples, the method comprises removing a removable sealing covering from the second proximal opening of the elongated sleeve before inserting the seal bridge into the second lumen.

[0024] In some examples, the method comprises extending the elongated sleeve to a chosen position adjacent the end portion of the needle.

[0025] In some examples, the method comprises maintaining the second lumen sealed to gas after bridging across and/or deactivating the seal.

[0026] In some examples, the method comprises progressing the seal bridge until bridging across and/or deactivating the seal.

[0027] According to a further aspect, a seal bridge for a laparoscopic port system is provided. The seal bridge comprises an elongated body adapted to be deployed in a lumen of an inter-sleeve and bridging across and/or

deactivating a seal of the inter-sleeve.

[0028] In some examples of the seal bridge, the elongated body comprises a distal opening, a sealed proximal end and a lumen extending at least partially therebetween.

[0029] In some examples of the seal bridge, the elongated body has a proximal segment and distal segment, the proximal segment has a larger outer diameter than the distal segment.

[0030] In some examples of the seal bridge, the lumen is adapted to receive an end portion of a needle when the needle entering the distal opening.

[0031] In some examples of the seal bridge, the distal opening opening has a beveled opening.

[0032] Unless otherwise defined, all technical and/or scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which the invention pertains. Although methods and materials similar or equivalent to those described herein can be used in the practice or testing of embodiments of the invention, exemplary methods and/or materials are described below. In case of conflict, the patent specification, including definitions, will control. In addition, the materials, methods, and examples are illustrative only and are not intended to be necessarily limiting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033] Some embodiments of the invention are herein described, by way of example only, with reference to the accompanying drawings. With specific reference now to the drawings in detail, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of embodiments of the invention. In this regard, the description taken with the drawings makes apparent to those skilled in the art how embodiments of the invention may be practiced.

[0034] In the drawings:

Fig. 1 schematically illustrates a cut view and an enlarged partial view of a laparoscopic port provided between a bodily cavity and an outer environment, adjacent a needle end portion, in accordance with an exemplary embodiment of the present invention; Figs. 2A-E schematically illustrate cut views showing different stages of passing a needle end portion through a laparoscopic port system, in accordance with an exemplary embodiment of the present invention;

Fig. 3 schematically illustrates a cut view and an enlarged partial view of a laparoscopic inter-sleeve system releasably connected to a seal bridge plug, in accordance with an exemplary embodiment of the present invention.

DETAILED DESCRIPTIONS OF EXEMPLARY EMBODIMENTS

[0035] The present invention generally relates to systems and methods for performing surgeries, and more specifically to methods and devices for micro-laparoscopic surgeries.

[0036] In an aspect of some embodiments, there is provided a system for performing laparoscopic surgeries that is configured for creating a contained passage there-through for a needle distal end from a body cavity to an outer environment. In some embodiments of the invention, the system includes a laparoscopic port having a lumen deployable between a body cavity and an outer environment. Reference is made to Fig. 1 which schematically illustrates a cut view and an enlarged partial view of a laparoscopic port 100 provided in or through a chamber wall between a bodily cavity or chamber and an outer environment, adjacent an end portion 212 of a needle system 200, in accordance with an exemplary embodiment of the present invention. The body cavity may be though not limited to an abdominal cavity; the outer environment may be though not limited to an outpatient environment, for example an operating room environment. Needle system 200 may be a manually operable system for connecting with and/or operating a detachable end effector or surgical head (not shown), and may be percutaneously or introducible via a small incision or a trocar system (not shown). Needle system 200 includes an elongated shaft 210 ending with end portion 212 and comprising a proximal portion 214 connected with a handle 220. Laparoscopic port 100 includes a body 110 having a proximal end 112, a distal end 114 and a lumen 120 provided along its length and opened at both sides on ends 112 and 114. Laparoscopic port 100 also includes a seal mechanism 130 provided in lumen 120 for preventing migration of inflation gas from body chamber to outer environment. Seal mechanism 130 may be any known and/or commercially available gas sealing combination or device, and may include a single or a plurality of seals, valves and/or membranes, for example a zero seal and/or an instrument seal.

[0037] In some embodiments, the system does not include a laparoscopic port but is intended for insertion through and/or connection with such, for example a commercially available sheath, trocar and/or port intended for laparoscopy.

[0038] In some embodiments of the invention, the system includes an elongated sleeve 300 (shown in Fig. 2B) which is telescopically introducible by an elongated sleeve body 310, optionally selectively to surgeon's choice, through laparoscopic port lumen 120 thereby bypassing through seal mechanism 130. This way seal mechanism 130 is being forced to open and accommodate traveling therethrough of artifacts at different sizes (e.g., needle end portion 212 with or without a surgical head connected thereto) while avoiding damage to its parts or members (e.g., seals or membranes) and/or hin-

dering the artifact. In some embodiments of the invention, elongated sleeve 300 is extendable to a predetermined location in the body cavity, thereby creating a contained passage from the predetermined location to the outer environment. Exemplary port bypassing sleeves or guiding cannulas are disclosed in International Patent application number PCT/IB2011/054102 filed September 19, 2011 and titled "Micro Laparoscopy Devices and Deployments thereof". In some embodiments of the invention, elongated sleeve 300 includes a proximal opening 312 at a proximal end of elongated sleeve body 310 (optionally provided with a removable sealing covering 340), a distal opening 314 at a distal end of elongated sleeve body 310 and a lumen 320 extending therebetween, opened at both ends. In order to prevent gas migration at deployment in the laparoscopic port, the elongated sleeve includes at least one seal 330 provided in its lumen. In some embodiments of the invention, the at least one seal 330 includes a zero seal that is adapted to prevent gas migration at absence of a surgical instrument provided therethrough and/or an instrument seal that is adapted to prevent gas migration when an instrument (optionally in a diameter for example between 1 to 12 mm) is provided therethrough.

[0039] In order to prevent potential damage and/or sticking of a sharp instrument end and/or a needle with sleeve seal 330 (especially but not limited to a zero type seal), a seal bridge 500 (shown in Fig. 2C) may be selectively deployable in elongated sleeve lumen 320. Seal bridge 500 may include an extension, referred to as elongated body 510, a sealed proximal end portion 512 and a seal bridge distal end portion 514. In some optional embodiments, elongated body 510 is segmented to at least two segments along its length that are differentiated by shape and/or size, for example proximal segment 516 and distal segment 518. In some embodiments, proximal segment 516 is sized and/or shaped to snugly fit in sleeve lumen 320, whereas distal segment 518 is sized and/or shaped to pass through and open sleeve seal 330, optionally in a centralized and/or homogenous fashion while avoiding any damage associated with size and/or orientation related circumstances. In some embodiments of the invention, seal bridge 500 is configured for bridging across and/or deactivating sleeve seal 330 when deployed, thereby facilitating unhindered passage for a needle or other artifact while preventing such damage and/or sticking to the seal. In some embodiments, seal bridge 500 is configured for bridging across all seals in a sleeve, optionally a distal-most seal, optionally a zero seal.

[0040] In some exemplary embodiments of the invention, seal bridge 500 is sealed to gas so that when deployed in elongated sleeve lumen 320, while bridging across and/or deactivating the sleeve seal(s) 330, no gas can escape from the body cavity and the outer environment. Optionally, additionally or alternatively, the seal bridge includes a removable cover and/or a selectively operable seal (not shown).

[0041] In some embodiments of the invention, the at least one sleeve seal 330 is positioned at a fixed length distal to proximal opening 312. The fixed length may be any length, for example 1 to 25 cm, optionally 5 cm distal to elongated sleeve proximal opening 312. In some embodiments of the invention, elongated body 510 is extendable in sleeve lumen 320 from proximal opening 312 and over the fixed length, thereby forcing seal 330 to open. Optionally, distal end portion 514 outer diameter is sized and/or shaped to fit in sleeve lumen 320 and divert seal 330.

[0042] Additionally and/or alternatively, in order to prevent potential damage and/or sticking of a sharp instrument end and/or a needle with sleeve seal 330 (especially but not limited to a zero type seal), a seal bridge 400 (shown in Fig. 2D) may be selectively deployable in elongated sleeve lumen 320. Seal bridge 400 may include an extension, at least partially hollow, referred to as elongated body 410, a sealed proximal end portion 412, an opened distal end 414 and a lumen 420 provided partially along seal bridge 400 length and communicating with opening at distal end 414. In some optional embodiments, elongated body 410 is segmented to at least two segments along its length that are differentiated by shape and/or size, for example proximal segment 416 and distal segment 418. In some embodiments, proximal segment 416 is sized and/or shaped to snugly fit in sleeve lumen 320, whereas distal segment 418 is sized and/or shaped to pass through and open sleeve seal 330, optionally in a centralized and/or homogenous fashion while avoiding any damage associated with size and/or orientation related circumstances. In some embodiments of the invention, seal bridge 400 is configured for bridging across and/or deactivating sleeve seal 330 when deployed, thereby facilitating unhindered passage for a needle or other artifact while preventing such damage and/or sticking to the seal. In some embodiments, seal bridge 400 is configured for bridging across all seals in a sleeve, optionally a distal-most seal, optionally a zero seal.

[0043] In some exemplary embodiments of the invention, seal bridge 400 is sealed to gas so that when deployed in elongated sleeve lumen 320, while bridging across and/or deactivating the sleeve seal(s) 330, no gas can escape from the body cavity and the outer environment. Optionally, additionally or alternatively, the seal bridge includes a removable cover and/or a selectively operable seal (not shown).

[0044] In some embodiments of the invention, the at least one sleeve seal 330 is positioned at a fixed length distal to proximal opening 312. The fixed length may be any length, for example 1 to 25 cm, optionally 5 cm distal to elongated sleeve proximal opening 312. In some embodiments of the invention, hollow extension or elongated body 410 is extendable in sleeve lumen 320 from proximal opening 312 and over the fixed length, thereby forcing seal 330 to open. Optionally, distal end 414 outer diameter is sized and/or shaped to fit in sleeve lumen 320 and divert seal 330.

[0045] In an aspect of some embodiments, there is also provided a method for passing a needle end portion provided in a body cavity to and/or from an outer environment. Reference is made to Figs. 2A, 2B, 2D and 2E which schematically illustrate, respectively, cut views showing different stages of passing a needle end portion 212 through laparoscopic port system 100, in accordance with an exemplary embodiment of the present invention. In some embodiments laparoscopic port 100 is first deployed to create a normally closed passage (with the normally closed sealing mechanism 130 or with other means) between body cavity or chamber and outer environment (as shown previously in Fig. 1). As shown in Fig. 2A, needle end portion 212 is adjacent distal end 114 of port 100 although it may be substantially remote and other means (such as elongated sleeve 300 with or without other devices or mechanisms) may be used to approach, engage, capture and/or provide direct and/or contained passage to or adjacent port distal end 114. In some embodiments, elongated sleeve 300 is readily provided or is telescopically introduced into laparoscopic port lumen 120 and extended to a chosen positioning adjacent needle end portion 212. Fig. 2B shows elongated sleeve 300 fixedly positioned in and across lumen 120 thereby bypassing across seal mechanism 130, while needle end portion 212 is further extended in sleeve lumen 320 in and across port distal end 114 adjacent closed sleeve seal 330.

[0046] In some embodiments, seal bridge 400 is readily provided or, as shown in Fig. 2D (but also, similarly, in 2C), is next inserted in sleeve lumen 320 while bridging across and/or deactivating the at least one sleeve seal 330. The needle end portion 212 may then be passed via sleeve lumen 320 across the at least one sleeve seal 330. In order to connect an end effector, a surgical head or any other designated head (not shown) to needle end portion 212, the latter may first be extended out in outer environment, therefore the seal bridge should first be removed or uncovered, as shown in Fig. 2E, so it will not disrupt this extension. In some embodiments, seal bridge 400 (or, similarly, seal bridge 500 in Fig. 2C) is manually removed by the medical practitioner, and/or needle 200 itself is used to withdraw the seal bridge by being applied to push it proximally to a complete removal.

[0047] Reference is now made to Fig. 3 which schematically illustrates a cut view and an enlarged partial view of a system 1000 comprising a laparoscopic intersleeve 1100 releasably connected to a seal bridge, such as a seal bridge plug, 1200, in accordance with an exemplary embodiment of the present invention. Intersleeve 1100 is telescopically deployable in a laparoscopic port (not shown) which may or may not be a universal or other commercially available port, sized and configured for providing passage to regular sized instruments in diameters of less than 25 mm, optionally less than 15 mm, or optionally of less than 10 mm or of any intermediate value. Inter-sleeve 1100 includes an elongated hollow body 1110 distally connected to a contractible-ex-

pandable funnel-like member 1120 meant for improving engagement and/or accommodating entry of slender or other artifacts, such as a needle end portion, into hollow body 1110. Hollow body 1110 is connected at its proximal end to a handle 1130 also serves as a housing for a snapped-in seal mechanism 1140. Seal mechanism 1140 includes a proximal instruments seal 1146 and a distal zero seal 1144 connected with a tubular member 1142 having distal snap-locking means to connect with handle 1130. In some embodiments, instruments seal 1146 is a radially partially slitted flat, cone or dome type seal or an iris-type seal having a minute central opening capable of radially widening at oversized artifacts passing therethrough, while maintaining a sealed periphery thereabout. In some embodiments, distal zero seal 1144 may be a duckbill type seal or any membrane-type seal configured for complete sealing when under a predetermined minimal positive pressure difference between bodily chamber and outer environment and when it is not diverted or forced open, for example by an artifact passing therethrough.

[0048] Seal bridge plug 1200 includes a hollow tube portion 1210 air-tightly encompassing at a proximal portion thereof a mating protrusion 1232 of a handheld plug 1230. Plug 1230 may be removable or permanently fixed in tube portion 1210, and optionally and alternatively, plug 1230 and tube portion 1210 are formed as a single part. Distal end 1220 may have internal beveled edges (such as divergently opened) to improve unhindered sliding thereunto of non-concentrically positioned artifacts.

[0049] Seal bridge plug 1200 is shown fully deployed in inter-sleeve 1100 lumen in a way that bypasses and bridges across both seals 1144 and 1146; while the distal zero seal 1144 is forced to be opened and deactivated, the proximal instruments seal 1146 is forced to widen its central opening around periphery of tube portion 1210 in an air-tight fashion. As shown in Fig. 3, seal bridge plug 1200 is sized to receive a length of an incoming needle end portion distally away from seals 1144 and 1146. When a needle end portion (not shown) is received and pressed against protrusion 1232 to force seal bridge plug 1200 out, it first emerges through zero seal 1144 and then instruments seal 1146, before tube portion 1210 is completely withdrawn from the seals, so that when such withdrawing happens, a new air-tight relations are accomplished between instruments seal 1146 and periphery of needle free end.

[0050] Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the broad scope of the appended claims.

Claims

1. A system for passing an end portion (212) of a needle system from a body cavity to an outer environment through a laparoscopic port, the system comprising at least one laparoscopic port (100), the port defining at least a first lumen (120) and at least a seal mechanism (130) across said lumen, the system further comprising:

a needle instrument (200) comprising a shaft (210) and distal end portion (312);
an elongated sleeve (300), comprising a second proximal opening (213), a second distal opening (314), a second lumen (320) extending between said second proximal opening (312) and said second distal opening (314), and a seal (330) provided in said second lumen (320)

a seal bridge (400), comprising an elongated body (410);

wherein said elongated sleeve (300) is telescopically introducible through a first proximal end (112) of said port (100), through said first lumen (120) and bypassing said seal mechanism (130) of said laparoscopic port (100); thereby bridging across and/or deactivating said seal mechanism (130);

wherein said elongated body (410) of said seal bridge (400) comprises a distal opening (414) and a lumen (420) extending at least partially from said distal opening (414) towards a proximal end of the seal bridge, the seal bridge lumen (420) being sealed to gas at one end; and said seal bridge being adapted to be inserted through said second proximal opening to be deployed in said second lumen and thereby bridging across and/or deactivating said seal (330) of said elongated sleeve; wherein said seal bridge lumen (420) is adapted to receive said distal end portion (212) of said needle shaft (210) when said needle shaft (210) enters said distal opening (414) of said seal bridge (400).

2. The system according to claim 1, wherein said seal bridge (400) is telescopically introduced through said laparoscopic port (100) via the elongated sleeve (300).
3. The system according to any of claims 1 to 2, wherein said elongated body (410) has a proximal segment (416) and distal segment (418), and said proximal segment (416) has a larger outer diameter than said distal segment (418).
4. The system according to any of claim 1 to 3, wherein said distal opening (414) of said seal bridge (400) has a beveled opening.

Patentansprüche

1. System zum Führen eines Endabschnitts (212) eines Nadelsystems aus einer Körperhöhle durch einen laparoskopischen Port zu einer äußeren Umgebung, wobei das System mindestens einen laparoskopischen Port (100) umfasst, wobei der Port mindestens ein erstes Lumen (120) und mindestens einen Dichtungsmechanismus (130) über das Lumen hinweg definiert, wobei das System weiter Folgendes umfasst:

ein Nadelinstrument (200), das einen Schaft (210) und einen distalen Endabschnitt (312) umfasst;

eine langgestreckte Hülse (300), die eine zweite proximale Öffnung (213), eine zweite distale Öffnung (314), ein zweites Lumen (320), das sich zwischen der zweiten proximalen Öffnung (312) und der zweiten distalen Öffnung (314) erstreckt, und eine Dichtung (330), die in dem zweiten Lumen (320) vorgesehen ist, umfasst; eine Dichtungsbrücke (400), die einen langgestreckten Körper (410) umfasst;

wobei die langgestreckte Hülse (300) durch ein erstes proximales Ende (112) des Ports (100), durch das erste Lumen (120) und den Dichtungsmechanismus (130) des laparoskopischen Ports (100) umgehend teleskopisch einführbar ist; und dadurch den Dichtungsmechanismus (130) überbrückt und/oder deaktiviert; wobei der langgestreckte Körper (410) der Dichtungsbrücke (400) eine distale Öffnung (414) und ein Lumen (420), das sich mindestens teilweise von der distalen Öffnung (414) auf ein proximales Ende der Dichtungsbrücke zu erstreckt, umfasst, wobei das Dichtungsbrückenlumen (420) an einem Ende gegen Gas gedichtet ist; und

die Dichtungsbrücke dazu angepasst ist, durch die zweite proximale Öffnung eingeführt zu werden, um in dem zweiten Lumen eingesetzt zu werden und dadurch die Dichtung (330) der langgestreckten Hülse zu überbrücken und/oder zu deaktivieren;

wobei das Dichtungsbrückenlumen (420) dazu angepasst ist, den distalen Endabschnitt (212) des Nadelschafts (210) aufzunehmen, wenn der Nadelschaft (210) in die distale Öffnung (414) der Dichtungsbrücke (400) eindringt.

2. System nach Anspruch 1, wobei die Dichtungsbrücke (400) durch den laparoskopischen Port (100) über die langgestreckte Hülse (300) teleskopisch eingeführt wird.
3. System nach einem der Ansprüche 1 bis 2, wobei der langgestreckte Körper (410) ein proximales Segment (416) und ein distales Segment (418) aufweist

und das proximale Segment (416) einen größeren Außendurchmesser aufweist als das distale Segment (418).

4. System nach einem der Ansprüche 1 bis 3, wobei die distale Öffnung (414) der Dichtungsbrücke (400) eine abgeschrägte Öffnung aufweist.

Revendications

1. Système permettant de faire passer une partie d'extrémité (212) d'un système à aiguille depuis une cavité corporelle jusqu'à un environnement extérieur au travers d'un orifice laparoscopique, le système comportant au moins un orifice laparoscopique (100), l'orifice définissant au moins une première lumière (120) et au moins un mécanisme d'étanchéité (130) en travers de ladite lumière, le système comportant par ailleurs :

un instrument à aiguille (200) comportant une tige (210) et une partie d'extrémité distale (312) ; un manchon allongé (300), comportant une deuxième ouverture proximale (213), une deuxième ouverture distale (314), une deuxième lumière (320) s'étendant entre ladite deuxième ouverture proximale (312) et ladite deuxième ouverture distale (314), et un joint d'étanchéité (330) mis en oeuvre dans ladite deuxième lumière (320),

un pont d'étanchéité (400), comportant un corps allongé (410) ;

dans lequel ledit manchon allongé (300) est en mesure d'être introduit de manière télescopique au travers d'une première extrémité proximale (112) dudit orifice (100), au travers de ladite première lumière (120) et évitant ledit mécanisme d'étanchéité (130) dudit orifice laparoscopique (100) ; pour ainsi assurer un pontage en travers dudit mécanisme d'étanchéité (130) et/ou pour désactiver celui-ci ;

dans lequel ledit corps allongé (410) dudit pont d'étanchéité (400) comporte une ouverture distale (414) et une lumière (420) s'étendant au moins partiellement depuis ladite ouverture distale (414) vers une extrémité proximale dudit pont d'étanchéité, la lumière (420) du pont d'étanchéité étant scellée vis-à-vis des gaz au niveau d'une extrémité ; et

ledit pont d'étanchéité étant adapté pour être inséré au travers de ladite deuxième ouverture proximale à des fins de déploiement dans ladite deuxième lumière et pour ainsi assurer un pontage en travers dudit joint d'étanchéité (330) dudit manchon allongé et/ou pour désactiver celui-ci ;

dans lequel ladite lumière (420) du pont d'étanchéité est adaptée pour recevoir ladite partie d'extrémité distale (212) de ladite tige d'aiguille (210) quand ladite tige d'aiguille (210) entre dans ladite ouverture distale (414) dudit pont d'étanchéité (400). 5

2. Système selon la revendication 1, dans lequel ledit pont d'étanchéité (400) est introduit de manière télescopique au travers dudit orifice laparoscopique (100) par le biais du manchon allongé (300). 10
3. Système selon l'une quelconque des revendications 1 à 2, dans lequel ledit corps allongé (410) a un segment proximal (416) et un segment distal (418), et ledit segment proximal (416) a un diamètre extérieur supérieur par rapport audit segment distal (418). 15
4. Système selon l'une quelconque des revendications 1 à 3, dans lequel ladite ouverture distale (414) dudit pont d'étanchéité (400) a une ouverture en biseau. 20

25

30

35

40

45

50

55

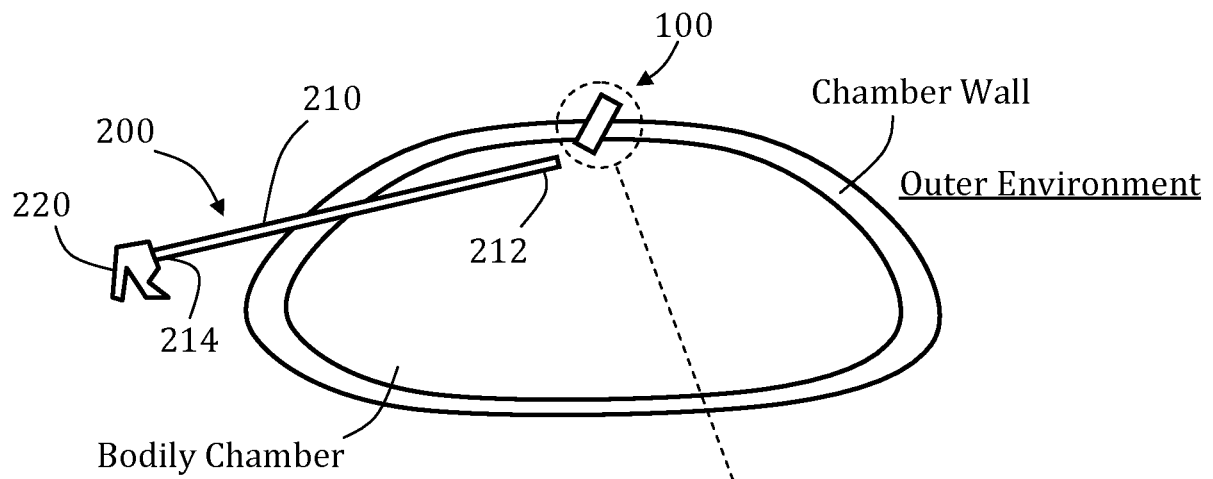


Fig. 1

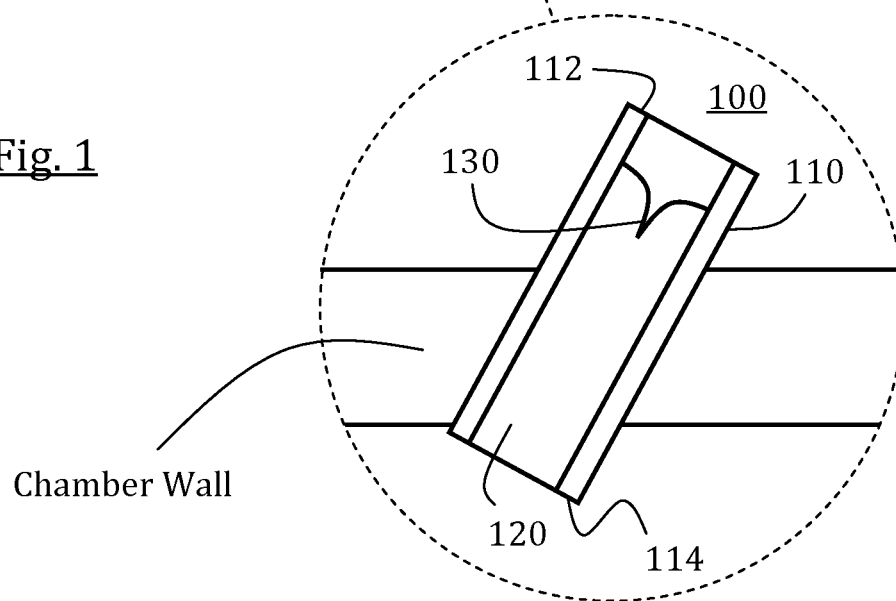


Fig. 2A

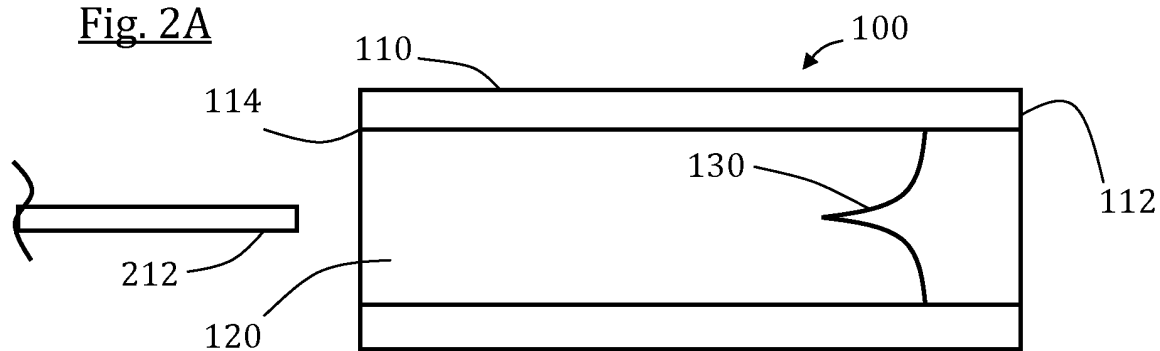


Fig. 2B

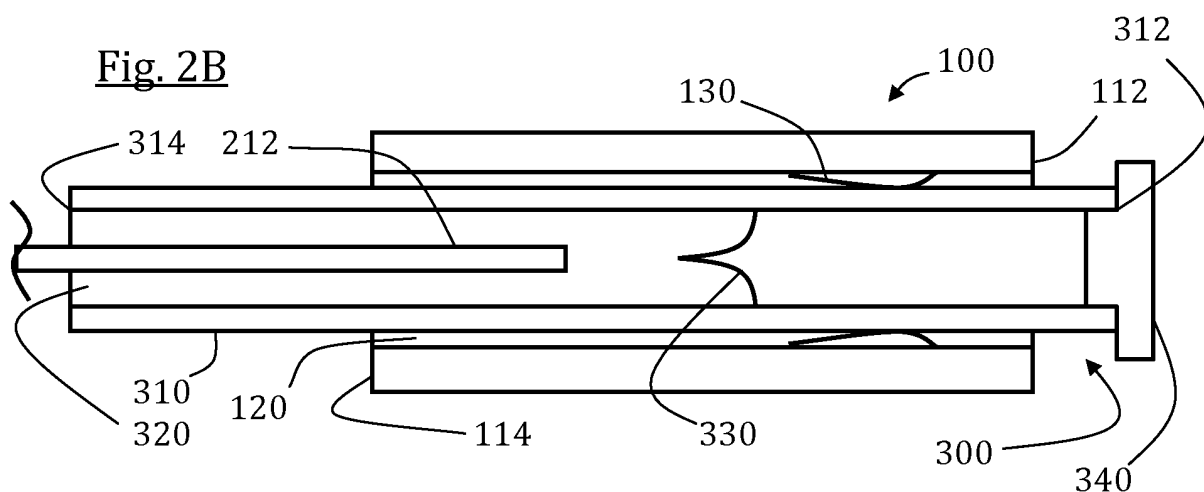


Fig. 2C

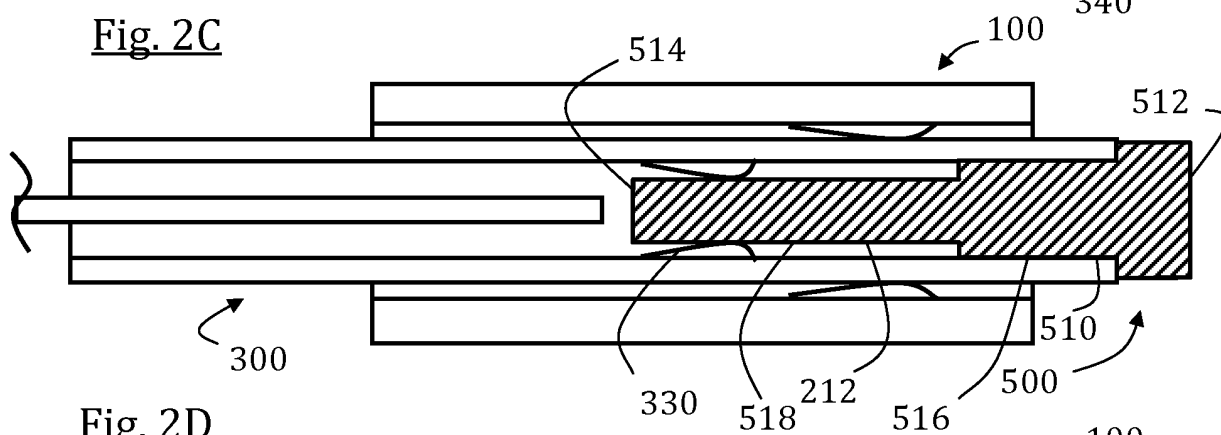
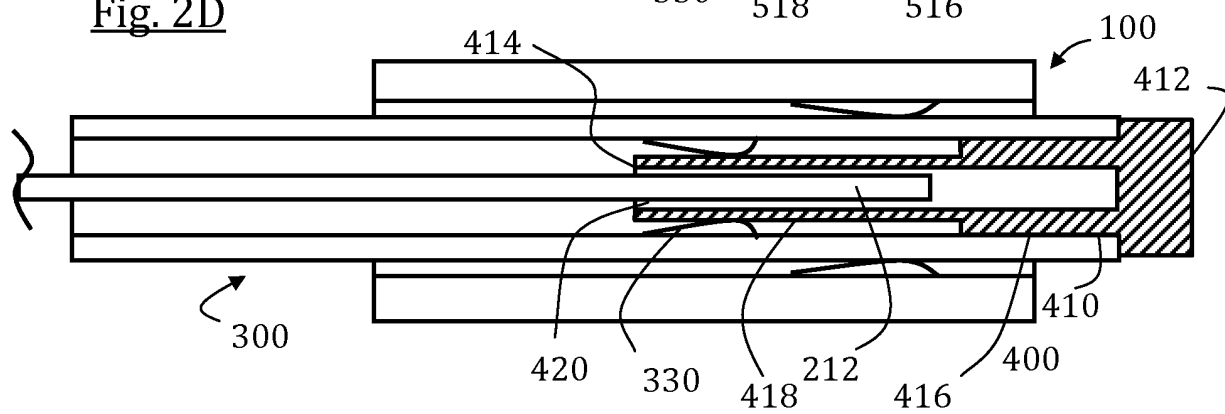
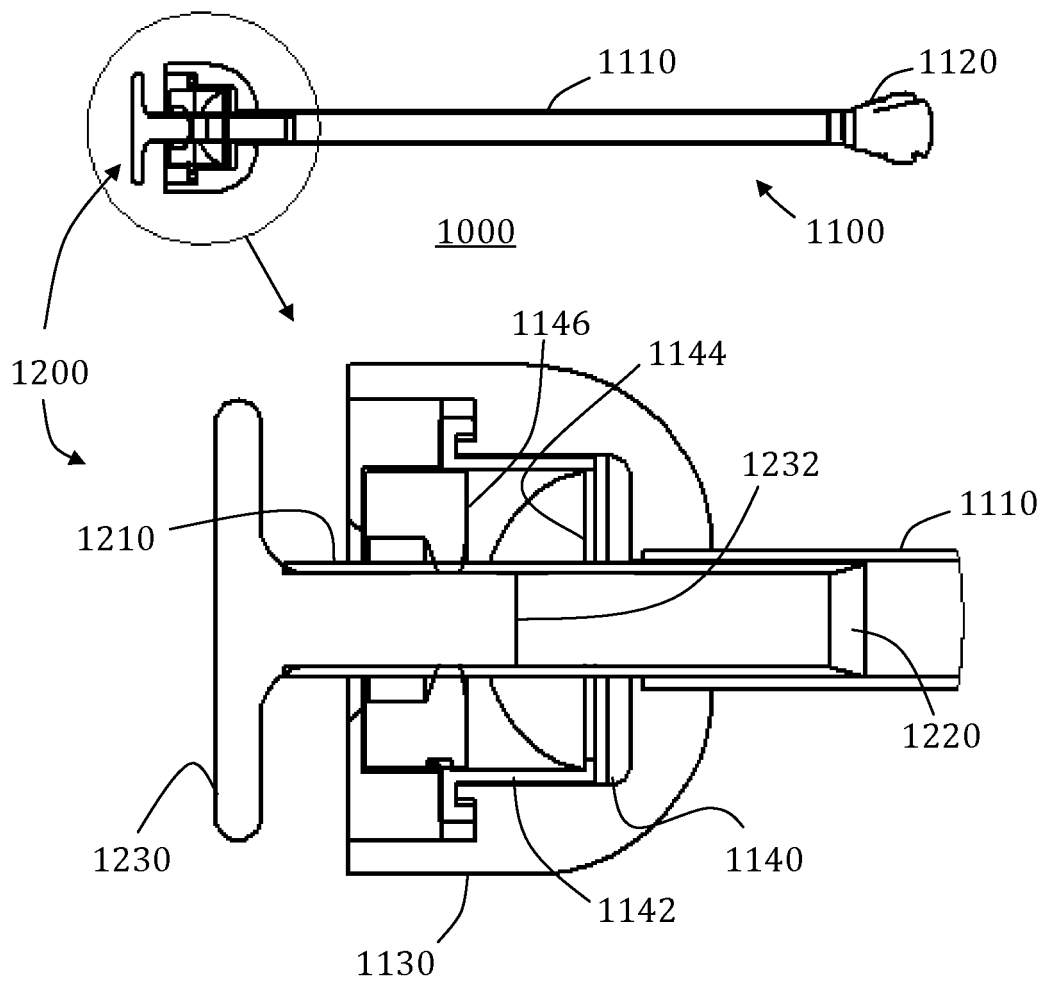
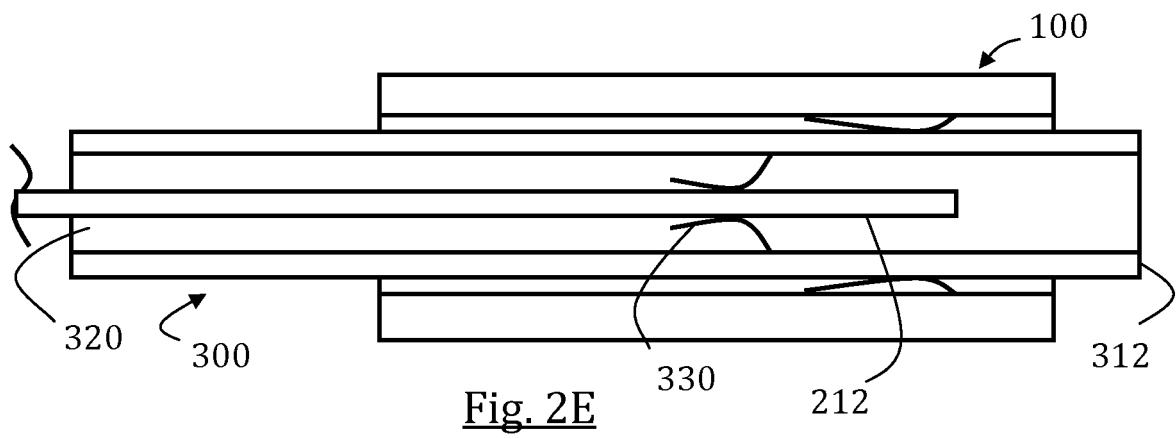


Fig. 2D





REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 5392766 A [0006]
- WO IB2011054102 A [0038]

专利名称(译)	腹腔镜密封桥		
公开(公告)号	EP2793718A1	公开(公告)日	2014-10-29
申请号	EP2012816293	申请日	2012-12-21
[标]申请(专利权)人(译)	意昂外科有限公司		
申请(专利权)人(译)	EON手术LTD.		
当前申请(专利权)人(译)	EON手术LTD.		
[标]发明人	BACHAR YEHUDA FARIN DANNY		
发明人	BACHAR, YEHUDA FARIN, DANNY		
IPC分类号	A61B17/34		
CPC分类号	A61B17/3421 A61B17/3462 A61B2017/3419 A61B2017/3441 A61B2017/3464 A61B17/0218		
优先权	61/579670 2011-12-23 US		
其他公开文献	EP2793718B1		
外部链接	Espacenet		

摘要(译)

提供一种用于通过腹腔镜端口将针系统的端部从体腔传递到外部环境的系统。该系统包括细长的套筒，该套筒包括第二近侧开口，第二远侧开口，在第二近侧开口和第二远侧开口之间延伸的第二内腔以及设置在第二内腔中的密封件。该系统还包括密封桥，该密封桥包括细长的主体。细长的套筒在第一近端通过第一内腔可伸缩地引入，并绕过腹腔镜端口的密封机构。密封桥适于插入通过第二近侧开口以在第二内腔中展开，从而跨过细长套筒的密封和/或使细长套筒的密封失效。