



(11) **EP 2 391 287 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**22.11.2017 Bulletin 2017/47**

(21) Application number: **09839054.5**

(22) Date of filing: **30.01.2009**

(51) Int Cl.:  
**A61B 17/02** <sup>(2006.01)</sup> **A61B 17/04** <sup>(2006.01)</sup>

(86) International application number:  
**PCT/CA2009/000117**

(87) International publication number:  
**WO 2010/085869 (05.08.2010 Gazette 2010/31)**

(54) **LAPAROSCOPIC TOOL FOR A LAPAROSCOPIC SURGERY**

LAPAROSKOPISCHES INSTRUMENT FÜR EINE LAPAROSKOPISCHE OPERATION

OUTIL LAPAROSCOPIQUE DE CHIRURGIE LAPAROSCOPIQUE

(84) Designated Contracting States:  
**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 SE SI SK TR**

(43) Date of publication of application:  
**07.12.2011 Bulletin 2011/49**

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**US-A1- 2005 234 512 US-A1- 2008 009 904**  
**US-A1- 2008 114 380 US-A1- 2008 262 525**

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## Description

### FIELD OF THE INVENTION

**[0001]** The subject matter disclosed generally relates to a surgical tool. More precisely, the present invention generally relates to a laparoscopic tool for laparoscopic surgery on an internal body tissue of a patient to be used in conjunction with a compatible anchor to secure or retract internal body tissues during the surgery.

### BACKGROUND OF THE INVENTION

**[0002]** During surgery, it sometimes happens that a surgeon has to reach a region to be operated upon that is located underneath an internal organ of a patient. In such cases, it is common in the art of surgery to anchor or retract the organ, or other internal soft body tissues, using suture anchor while performing the medical procedure. An approach often employed during traditional surgical procedures is by securing a suture anchor in a previously prepared borehole in a rigid structure such as an adjacent bone. A suture may then be attached to the anchor to secure the soft tissue in place. US Patent Application No. 2005/055052 to Lombardo et al. describes a knotless suture anchor and method for insertion into tissue, thereby allowing one to reversibly secure soft tissue without tying a knot. US Patent Application No. 2008/0009904 to Bourque et al. also describes a soft tissue fixation device that is used in the repair of soft tissue such as ligaments and tendons by insertion of the anchor into bone followed by attachment of sutures to the bone. These approaches, however, are not suitable for laparoscopic surgeries as no such adjacent rigid structure are conveniently accessible.

**[0003]** Laparoscopic surgery is a modern surgical technique in which operations in the abdomen are performed through small incisions (usually 0.5-1.5 cm) that are much less invasive than the larger incisions needed in traditional surgical procedures. During laparoscopic surgery, more traditional tools such as those described above may either not be used for lack of space or simply because they do not fit within a laparoscopic port. Instead, in order to fix or retract organs, laparoscopic surgeons use suture threads that are inserted at a first site, for example through an abdominal wall, looped and wound around a target organ and reinserted at the first site. The suture thread is then pulled to retract the target organ. Such an operation must be repeated multiple times for every organ in need of retracting, thereby increasing the time of the often-delicate procedures. Such a method of retracting is depicted in Figure 1.

**[0004]** Laparoscopic surgery is performed through a limited number of laparoscopic ports. These ports, which are points of entry into the abdomen, have to be used efficiently during the surgical procedure. US Patent Application No. 2005/0234512 to Nakao describes an endoscopic anchoring device assembly. The device com-

prises a series of anchor that may be delivered inside the patient and deployed into a target tissue, the device being operated by the surgeon extracorporeally through a pushing operation. However, this endoscopic anchoring device can only deliver and deploy anchors from the device itself, from the point of entry in the abdomen. Although it is now currently used in laparoscopic surgery, there would be no incentive to do so as either one less laparoscopic port would be available for other tools or one more laparoscopic port would be necessary.

**[0005]** Although not desirable, adding one extra laparoscopic port is however sometimes required since no alternatives currently exists. For example, to retract solid organs such as liver, specific dedicated retracting tools are used. Using the additional laparoscopic port nevertheless defeats the purpose of the laparoscopic surgery, which is to use as few ports and be as little intrusive as possible.

**[0006]** The devices discussed above display noticeable shortcomings in that they either may not be anchored adequately inside the abdominal cavity, use a laparoscopic port that could otherwise be used for other purposes, or do not allow multiple organs to be retracted in a time efficient manner. There is therefore a clear need for a better retracting tool adapted to laparoscopic surgery.

**[0007]** US2008/0262525 appears to relate to surgical instruments used to engage, penetrate, grasp, or manipulate tissue, and methods of their use. More particularly, it discloses an apparatus for penetrating and engaging tissue which comprises a control member, a tissue penetrating member, an activation mechanism and an elongated flexible member. The activation mechanism is responsive to the control member and operatively coupled to the tissue penetrating member. The elongated flexible member extends between and coupled to each of the control member and the tissue penetrating member. The tissue penetrating member includes a rigid member pivotally attached to the elongated flexible member.

**[0008]** US2004/0254427 appears to relate to surgical retractor stays, and more particularly to an improved grip assembly for a surgical retractor stay that can be used in surgery for retracting tissue at an incision and to a method of assembly thereof. The surgical stay-grip assembly comprises first and second jaw, each with first and second ends. The second jaw is pivotally connected to the first jaw. It further comprises a jaw closing member and an elongated member having first and second ends. The jaw closing member is used to urge the first end of the jaws together. The first end of the elongated member is connected to one of the jaws.

**[0009]** WO 2008/001882 discloses a medical holding apparatus provided with an anchor member composed of a tying-up portion to be tied up to an intracorporeal tissue and a first connection portion; and a locking member composed of a holding portion for holding another intracorporeal tissue, a medical instrument or a drug and a second connection portion, in which the first connection

portion and the second connection portion can be detachably connected to each other. A method of using the medical holding apparatus comprising steps of inserting the anchor member into a lumen of a cylindrical member; bringing the cylindrical member distal end close to a predetermined intracorporeal tissue surface; pushing the anchor member from the cylindrical member proximal end side so as to project the anchor member out of the cylindrical member distal end and tying up the anchor member to the intracorporeal tissue; holding another intracorporeal tissue, the medical instrument or the drug by the holding portion of the locking member; and connecting the second connection portion to the first connection portion by a magnetic force and the like.

## SUMMARY OF THE INVENTION

**[0010]** It is an object of the present invention to provide a laparoscopic tool that decreases the amount of time necessary to retract an organ.

**[0011]** It is another object of the present invention to provide a laparoscopic tool that leaves a laparoscopic port free for other tools to be inserted while performing its retracting function.

**[0012]** It is a further object of the present invention to provide a laparoscopic tool that provides more flexibility for changing a position from which a retraction is made than known laparoscopic tools or methods.

**[0013]** In a first embodiment there is disclosed a laparoscopic tool for surgery on an internal body tissue of a patient according to claims 1 to 10. The laparoscopic tool comprises a main body to which is affixed an attachment. The main body has a main aperture for fixing a compatible anchor. The attachment has a support member, which is connected to the main body, and a needle portion itself connected to the support member. The needle portion has an interlocking mechanism to interlock with the support member. The attachment is deployable from a first position aligned with the main body, for insertion through a laparoscopic port, to a second position unaligned with the main body, for insertion into a tissue and for anchoring the tool to the tissue.

**[0014]** There is disclosed a method of performing a laparoscopic surgery on a first internal body tissue of a patient. The method of performing the laparoscopic surgery comprises inserting a laparoscopic tool through a laparoscopic port inserted into the body of a patient, securing the laparoscopic tool to a first internal body tissue of the patient and leaving the laparoscopic tool therein, attaching a first portion of a compatible anchor to the laparoscopic tool, and finally attaching a second portion of the compatible anchor to a second internal tissue of the patient. There is also disclosed a use of a laparoscopic tool for surgery on an internal body tissue of a patient. The laparoscopic tool comprises a main body to which is affixed an attachment. The main body has a main aperture for fixing a compatible anchor and an attachment. The attachment has a support member which

is connected to the main body, and a needle portion itself connected to the support member. The needle portion has an interlocking mechanism to interlock with the support member. The attachment is deployable from a first position aligned with the main body, for insertion through a laparoscopic port, to a second position unaligned with the main body, for insertion into a tissue and for anchoring the tool to the tissue.

**[0015]** In yet another embodiment, there is disclosed a kit for surgery on an internal body tissue of a patient according to claims 11 and 12. The kit comprises a laparoscopic tool and a compatible anchor. The laparoscopic tool comprises a main body to which is affixed an attachment. The main body has a main aperture for fixing a compatible anchor and an attachment. The attachment has a support member which is connected to the main body, and a needle portion itself connected to the support member. The needle portion has an interlocking mechanism to interlock with the support member. The attachment is deployable from a first position aligned with the main body, for insertion through a laparoscopic port, to a second position unaligned with the main body, for insertion into a tissue and for anchoring the tool to the tissue.

**[0016]** Other features and advantages of the subject matter hereof will become more apparent in light of the following detailed description of selected embodiments, as illustrated in the accompanying figures. As will be realized, the subject matter disclosed and claimed is capable of modifications in various respects, all without departing from the scope of the claims. Accordingly, the drawings and the description are to be regarded as illustrative in nature, and not as restrictive and the full scope of the subject matter is set forth in the claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0017]

Fig. 1 is a perspective view of an abdominal cavity showing an organ being retracted by stitches passing through an abdominal wall as per a prior art method.

Fig. 2 is a perspective view of the laparoscopic tool having the support member and the needle portion interlocked in accordance with an embodiment of the present invention.

Fig. 3 is a perspective view of the laparoscopic tool of Fig. 2 having the support member and the needle portion deployed and aligned with the main body such as for insertion through a laparoscopic port.

Fig. 4 is a perspective view of the laparoscopic tool of Fig. 2 inside an abdominal cavity showing the laparoscopic tool anchored in an abdominal wall and a compatible anchor attached to an organ to be re-

tracted.

Fig. 5a is a perspective view of a sharp hook type of compatible anchor for use with the laparoscopic tool of Fig. 2 in accordance with an embodiment of the present invention.

Fig. 5b is a perspective view of a type of compatible anchor having a widened support portion for use with the laparoscopic tool of Fig. 2 in accordance with another embodiment of the present invention.

Fig. 5c is a perspective view of a blunt hook type of compatible anchor for use with the laparoscopic tool of Fig. 2 in accordance with another embodiment of the present invention.

Fig. 5d is a perspective view of a grasper type of compatible anchor for use with the laparoscopic tool of Fig. 2 in accordance with another embodiment of the present invention.

Fig. 6 is a perspective view of an abdominal cavity showing an organ being retracted by the laparoscopic tool of Fig. 2 with the compatible anchor of Fig. 5a, where the laparoscopic tool is attached to the abdominal wall and the compatible anchor is attached to the retracted organ.

Fig. 7 is a perspective view of an abdominal cavity showing an organ being retracted by the laparoscopic tool of Fig. 2 with the compatible anchor of Fig. 5b, where the laparoscopic tool is attached to the abdominal wall and the compatible anchor is slipped under the retracted organ, in the present case a liver.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] The laparoscopic tool of the present invention is used to retract an organ during laparoscopic surgery by attaching the tool to a first internal body tissue, such as an inside wall of an abdominal cavity, and by attaching a compatible anchor between a target tissue, such as the organ, at one end, and the laparoscopic tool at the other end.

[0019] Fig. 2 shows the laparoscopic tool 10 in accordance with an embodiment of the present invention. The laparoscopic tool 10 comprises a main body 12 having a main aperture 14, adapted to receive a compatible anchor, and an attachment 20. The attachment 20 has a support member 22 connected to the main body 12, and a needle portion 24 connected to the support member 22. The needle portion 24 has an interlocking mechanism 26 to interlock with the support member 22. The support member 22 may be connected proximate its mid portion to the main body 12.

[0020] Fig. 3 is now concurrently referred to. The at-

tachment 20 is deployable from a deployed position aligned with the main body 12, as shown in Fig. 3, used for insertion into an abdominal cavity through a laparoscopic port, to a locking position unaligned with the main body 12, as shown in Fig. 2, for insertion into the internal body tissue and for securing the laparoscopic tool 10 to the tissue. Although shown as arcuate, the needle portion 24 may take different functional shapes. The cross-section of the needle portion is advantageously flattened so as to distribute the load of a retracted organ on a larger area of the internal body tissue in which the needle portion 24 is inserted. The needle portion 24 and the support member 22 may be made of a single flexible piece, or can be made of two separate pieces, as depicted, that are hingedly connected.

[0021] Fig. 4 is now concurrently referred to. The laparoscopic tool 10 is shown with its needle portion 24 inserted in the abdominal wall 27 (partially shown) and locked to the support member 22. An embodiment of a compatible anchor 28 is also shown. The main aperture 14 of the laparoscopic tool 10 comprises a locking mechanism 16. The locking mechanism 16 is releasable and is preferably biased closed so as to lock on the compatible anchor 28. The locking mechanism 16 comprises an actuating portion 18 to actuate the locking mechanism 16. This actuating portion 18 may be grabbed with another laparoscopic tool, such as a laparoscopic grasper 29 so as to open the main aperture 14 such that one end of the compatible anchor 28 may be inserted. One end of the compatible anchor may be inserted in the opened main aperture 14 after actuation of the locking mechanism 16, and the other end of the compatible anchor 28 may be attached to the target tissue, or organ 31.

[0022] The main aperture 14 of the laparoscopic tool 10 may comprise corrugations 30 therein. The corrugations 30 on the inside surface of the main aperture 14 provide added grip on the compatible anchor 28 once inserted in the main aperture 14. This prevents accidental removal of the compatible anchor 28.

[0023] To provide more attachment options, for example, to retract more than one organ, the laparoscopic tool 10 may comprise one or more secondary apertures 40 on the main body 12. Optionally, the secondary apertures 40 may also be equipped with one locking mechanism similar to the locking mechanism 16. Secondary apertures may be used to fix additional compatible anchors or to receive suture threads.

[0024] Optionally, the laparoscopic tool 10 may comprise one or more notches 42 on the main body 12. These notches 42 may be used to engage and hold in place suture threads, or thread-like portions of any compatible anchor used.

[0025] Figs. 5a to 5d, now referred to, show four different embodiments of the compatible anchor 28. As shown, the compatible anchor 28 may adopt different designs. For example, the compatible anchor 28 may comprise a resilient body 44, such as an elastic band, (of a material compatible with the human body) having a

sharp hook 46 at one end to attach to the organ to be retracted. This embodiment is depicted in Fig. 5a. Alternatively, the compatible anchor 28 may comprise many resilient bodies 44, each having one sharp hook 46 at their respective end to attach to the one or to many organs to be retracted.

**[0026]** Alternatively, the compatible anchor 28 may have its resilient body 44 widened to provide a support portion 48, as shown in Fig. 5b. This widened support portion 48 may optionally comprise corrugations 50 or bosses (not shown), which prevent slipping of the retracted organ 31.

**[0027]** Fig. 5c shows another embodiment of the compatible anchor 28. This type of compatible anchor is called a blunt hook type and is used to retract tubular structures, such as arteries.

**[0028]** Fig. 5d shows yet another embodiment of the compatible anchor 28, in this case, a grasper type. The grasper type is used to grasp tissues.

**[0029]** Fig. 6 is now concurrently referred to. To proceed with a retraction of the organ, a first portion of the compatible anchor 28 is attached to the laparoscopic tool 10 by inserting it in the aperture 14. A second portion of the compatible anchor 28 is attached to the organ 31 to be retracted, and the compatible anchor 28 retracts the target organ by returning to its original shape by nature of its resiliency.

**[0030]** Fig. 7 is now concurrently referred to. To proceed with the retraction of the organ 31, the first portion of the compatible anchor 28 is attached to the laparoscopic tool 10 by inserting it in aperture 14. The compatible anchor 28 is slipped under the organ 31 to be retracted, thereby positioning the widened support portion 48 under the organ 31. The second portion of the compatible anchor 28 is attached to the laparoscopic tool 10 by inserting it into one of the secondary apertures 40. Following this, the compatible anchor 28 may be pulled through the aperture 14 to retract the target organ 31.

**[0031]** Alternatively, the compatible anchor 28 may be a thread-like material similar to threads used for stitching. In this case, the compatible anchor 28 is similar to the compatible anchor 28 depicted in Fig. 5a except that the body 44 is not resilient, but takes the form of a thread, such as a suture thread. To proceed with a retraction of the organ 31, a first portion of the compatible anchor 28 is attached to the laparoscopic tool 10 by inserting it in aperture 14. The compatible anchor 28 may be pushed through the target organ 31 with the hook 46. Otherwise, the compatible anchor 28 may be wound around the target organ 31 to be retracted and the second portion of the compatible anchor 28 may be attached to the laparoscopic tool 10 by inserting it into one of the secondary apertures 40. The organ 31 is retracted by pulling on the compatible anchor 28 or by any other manner available within the confined space of the abdomen.

**[0032]** In the preceding examples, reference was made to a target tissue that is usually different than the tissue where the laparoscopic tools 10 has been inserted.

However, it would alternatively be possible to attach the compatible anchor 28 to the same tissue as the tissue where the laparoscopic tool 10 was inserted so that the tissue is retracted on itself. In use, a surgeon performs the laparoscopic surgery on the patient by inserting the laparoscopic tool 10 through the laparoscopic port in the abdomen of the patient. The attachment 20 of the laparoscopic tool 10 must be in its aligned position, displayed at Fig. 3, for being inserted in the laparoscopic port. Using the suitable handling tool inserted in a second laparoscopic port, the surgeon then secures the laparoscopic tool 10 to the wall of the internal abdominal cavity of the patient. The laparoscopic tool 10 being secured, the surgeon may then reuse the laparoscopic port in which the laparoscopic tool 10 was inserted for insertion of other tools or devices. To proceed with a retraction of one organ, the first portion of the compatible anchor 28 is attached to the laparoscopic tool 10, and the second portion of the compatible anchor 28 is attached to the organ 31 to be retracted. Alternatively, the compatible anchor 28 may be slipped under, pushed through, or wound around the target organ 31 before the second portion of the compatible anchor 28 is inserted into one of the secondary apertures 40 and the organ is retracted by a pulling action applied to the compatible anchor 28.

**[0033]** In another embodiment of the invention, a kit is provided that may be sold ready for use by surgeons. The kit comprises the laparoscopic tool 10 in accordance with the present invention, along with suitable compatible anchors 28. The suitable compatible anchors 28 may be simple suture threads, or be of thread-like configurations, comprise resilient portions, hooks, support strips for the organs (with and without corrugation or bosses to provide resistance and prevent slippage).

**[0034]** The embodiments and examples presented herein are illustrative of the general nature of the subject matter claimed and are not limiting. It will be understood by those skilled in the art how these embodiments can be readily modified and/or adapted for various applications and in various ways.

**[0035]** The claims hereof are to be understood to include without limitation all alternative embodiments and equivalents of the subject matter hereof. Phrases, words and terms employed herein are illustrative and are not limiting.

**[0036]** It will be appreciated that any aspects of the different embodiments disclosed herein may be combined in a range of possible alternative embodiments, and alternative combinations of features, as long as they fall within the technical scope of the claims.

## Claims

1. A laparoscopic tool (10) for use with a compatible anchor (28) to retract an organ in surgery on an internal body tissue of a patient, said laparoscopic tool comprising:

- a main body (12) having a main aperture (14) for fixing a compatible anchor; and an attachment (20) having a support member (22) connected to said main body; and a needle portion (24) connected to said support member, wherein said support member (22) and said needle portion (24) of the attachment (20) are deployable in a first position aligned with said main body (12), for insertion into a laparoscopic port, to a second locking position unaligned with said main body (12) for insertion into a tissue and for anchoring said tool (10) to said tissue, **characterised in that** said needle portion (24) further has an interlocking mechanism (26) to interlock with said support member (22), and **in that** said main aperture comprises a first locking mechanism (16), and an actuating portion (18) to actuate said first locking mechanism (16), said first locking mechanism (16) being normally biased closed and releasable with said actuating portion (18).
2. The laparoscopic tool of claim 1, wherein said main aperture (14) is corrugated therein.
  3. The laparoscopic tool of any one of claims 1 to 2, wherein said main body (12) further comprises at least one secondary aperture (40).
  4. The laparoscopic tool of claim 3, wherein said at least one secondary aperture (40) further comprises a second locking mechanism.
  5. The laparoscopic tool of any one of claims 1 to 4, wherein said main body (12) further comprises at least one notch (42).
  6. The laparoscopic tool of any one of claims 1 to 5, wherein said needle portion (24) is arcuate.
  7. The laparoscopic tool of any one of claims 1 to 6, wherein said needle portion (24) has a flat cross-section.
  8. The laparoscopic tool of any one of claims 1 to 7, wherein said support member (22) is pivotally connected to said main body.
  9. The laparoscopic tool of any one of claims 1 to 8, wherein said main body (12) is connected proximate a mid portion of said support member (22).
  10. The laparoscopic tool of any one of claims 1 to 9, wherein said needle portion (24) is pivotally connected to said support member (22).
  11. A kit for surgery on an internal body tissue of a pa-

tient, said kit comprising: a laparoscopic tool of any one of claims 1 to 10; and a compatible anchor (28), adapted to be inserted in said main aperture.

- 5 12. The kit of claim 11, wherein said compatible anchor (28) has a resilient portion.

#### Patentansprüche

- 10 1. Laparoskopie-Werkzeug (10) zur Verwendung mit einem kompatiblen Anker (28) zum Zurückziehen eines Organs bei einer Operation an einem inneren Körpergewebe eines Patienten, wobei das Laparoskopie-Werkzeug umfasst:

einen Hauptkörper (12), welcher eine Hauptöffnung (14) zum Befestigen eines kompatiblen Ankers aufweist, und ein Befestigungsteil (20), welches aufweist:

ein Trageelement (22), welches mit dem Hauptkörper verbunden ist; und einen Nadelabschnitt (24), welcher mit dem Trageelement verbunden ist, wobei das Trageelement (22) und der Nadelabschnitt (24) des Befestigungsteils (20) in einer ersten Position ausfahrbar sind, welche mit dem Hauptkörper (12) ausgerichtet ist, zum Einführen in eine laparoskopische Öffnung, zu einer zweiten Sperrposition, welche mit dem Hauptkörper (12) nicht ausgerichtet ist, zum Einführen in ein Gewebe und zum Verankern des Werkzeugs (10) an dem Gewebe,

#### dadurch gekennzeichnet, dass

der Nadelabschnitt (24) ferner einen Verriegelungsmechanismus (26) zum Verriegeln mit dem Trageelement (22) aufweist, und dass die Hauptöffnung einen ersten Sperrmechanismus (16) und einen Betätigungsabschnitt (18) zum Betätigen des ersten Sperrmechanismus (16) umfasst, wobei der erste Sperrmechanismus (16) normalerweise geschlossen vorbelastet und mit dem Betätigungsabschnitt (18) freigebbar ist.

2. Laparoskopie-Werkzeug nach Anspruch 1, wobei die Hauptöffnung (14) darin gewölbt ist.
3. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 2, wobei der Hauptkörper (12) ferner wenigstens eine sekundäre Öffnung (40) umfasst.
4. Laparoskopie-Werkzeug nach Anspruch 3, wobei die wenigstens eine sekundäre Öffnung (40) ferner einen zweiten Sperrmechanismus umfasst.

5. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 4 wobei der Hauptkörper (12) ferner wenigstens eine Kerbe (42) umfasst.
6. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 5, wobei der Nadelabschnitt (24) bogenförmig ist. 5
7. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 6, wobei der Nadelabschnitt (24) einen ebenen Querschnitt aufweist. 10
8. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 7, wobei das Trageelement (22) schwenkbar mit dem Hauptkörper verbunden ist. 15
9. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 8, wobei der Hauptkörper (12) nahe einem Mittelabschnitt des Tragelements (22) verbunden ist.
10. Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 9, wobei der Nadelabschnitt (24) schwenkbar mit dem Tragelement (22) verbunden ist. 20
11. Ausrüstung für eine Operation an einem inneren Körpergewebe eines Patienten, wobei die Ausrüstung umfasst: 25
  - ein Laparoskopie-Werkzeug nach einem der Ansprüche 1 bis 10; und
  - einen kompatiblen Anker (28), welcher dazu eingerichtet ist, in die Hauptöffnung eingeführt zu werden.
12. Ausrüstung nach Anspruch 11, wobei der kompatible Anker (28) einen elastischen Abschnitt aufweist. 30

## Revendications

1. Outil laparoscopique (10) destiné à être utilisé avec un ancrage compatible (28) pour rétracter un organe durant une opération chirurgicale sur un tissu corporel interne d'un patient, ledit outil laparoscopique comprenant: 40
  - un corps principal (12) ayant une ouverture principale (14) pour fixer un ancrage compatible; et
  - un dispositif de fixation (20) ayant un élément de support (22) relié audit corps principal; et
  - une partie aiguille (24) reliée audit élément de support,
- dans lequel ledit élément de support (22) et ladite partie aiguille (24) du dispositif de fixation (20) sont déployables dans une première position alignée avec ledit corps principal (12), pour insertion dans 50

un port laparoscopique, vers une seconde position de verrouillage non alignée avec ledit corps principal (12), pour insertion dans un tissu et pour ancrer ledit outil (10) sur ledit tissu

**caractérisé en ce que** ladite partie aiguille (24) a en outre un mécanisme de verrouillage (26) destiné à se verrouiller avec ledit élément de support (22), et que ladite ouverture principale comprend un premier mécanisme de verrouillage (16) et une partie d'actionnement (18) pour actionner ledit premier mécanisme de verrouillage (16), ledit premier mécanisme de verrouillage (16) étant normalement sollicité et fermé et pouvant être libéré avec ladite partie d'actionnement (18).

2. Outil laparoscopique selon la revendication 1, dans lequel l'intérieur de ladite ouverture principale (14) est ondulé.
3. Outil laparoscopique selon l'une quelconque des revendications 1 à 2, dans lequel ledit corps principal (12) comprend en outre au moins une ouverture secondaire (40). 20
4. Outil laparoscopique selon la revendication 3, dans lequel ladite au moins une ouverture secondaire (40) comprend en outre un second mécanisme de verrouillage. 25
5. Outil laparoscopique selon l'une quelconque des revendications 1 à 4, dans lequel ledit corps principal (12) comprend en outre au moins une encoche (42). 30
6. Outil laparoscopique selon l'une quelconque des revendications 1 à 5, dans lequel ladite partie d'aiguille (24) est arquée. 35
7. Outil laparoscopique selon l'une quelconque des revendications 1 à 6, dans lequel ladite partie d'aiguille (24) a une section transversale plate. 40
8. Outil laparoscopique selon l'une quelconque des revendications 1 à 7, dans lequel ledit élément de support (22) est relié de manière pivotante audit corps principal. 45
9. Outil laparoscopique selon l'une quelconque des revendications 1 à 8, dans lequel ledit corps principal (12) est connecté à proximité d'une partie médiane dudit élément de support (22). 50
10. Outil laparoscopique selon l'une quelconque des revendications 1 à 9, dans lequel ladite partie d'aiguille (24) est reliée de manière pivotante audit élément de support (22). 55
11. Une trousse pour une intervention chirurgicale sur un tissu corporel interne d'un patient, ladite trousse

comprenant:

un outil laparoscopique selon l'une quelconque  
des revendications 1 à 10; et  
un ancrage compatible (28), adaptée pour être 5  
insérée dans ladite ouverture principale.

12. La trousse selon la revendication 11, dans lequel  
ledit ancrage compatible (28) présente une partie 10  
élastique.

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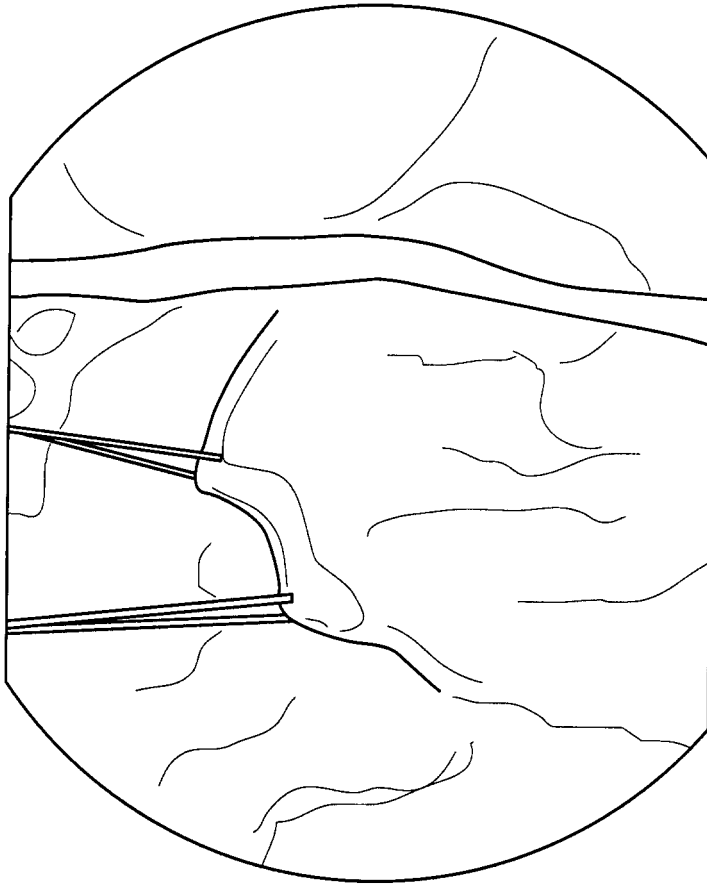
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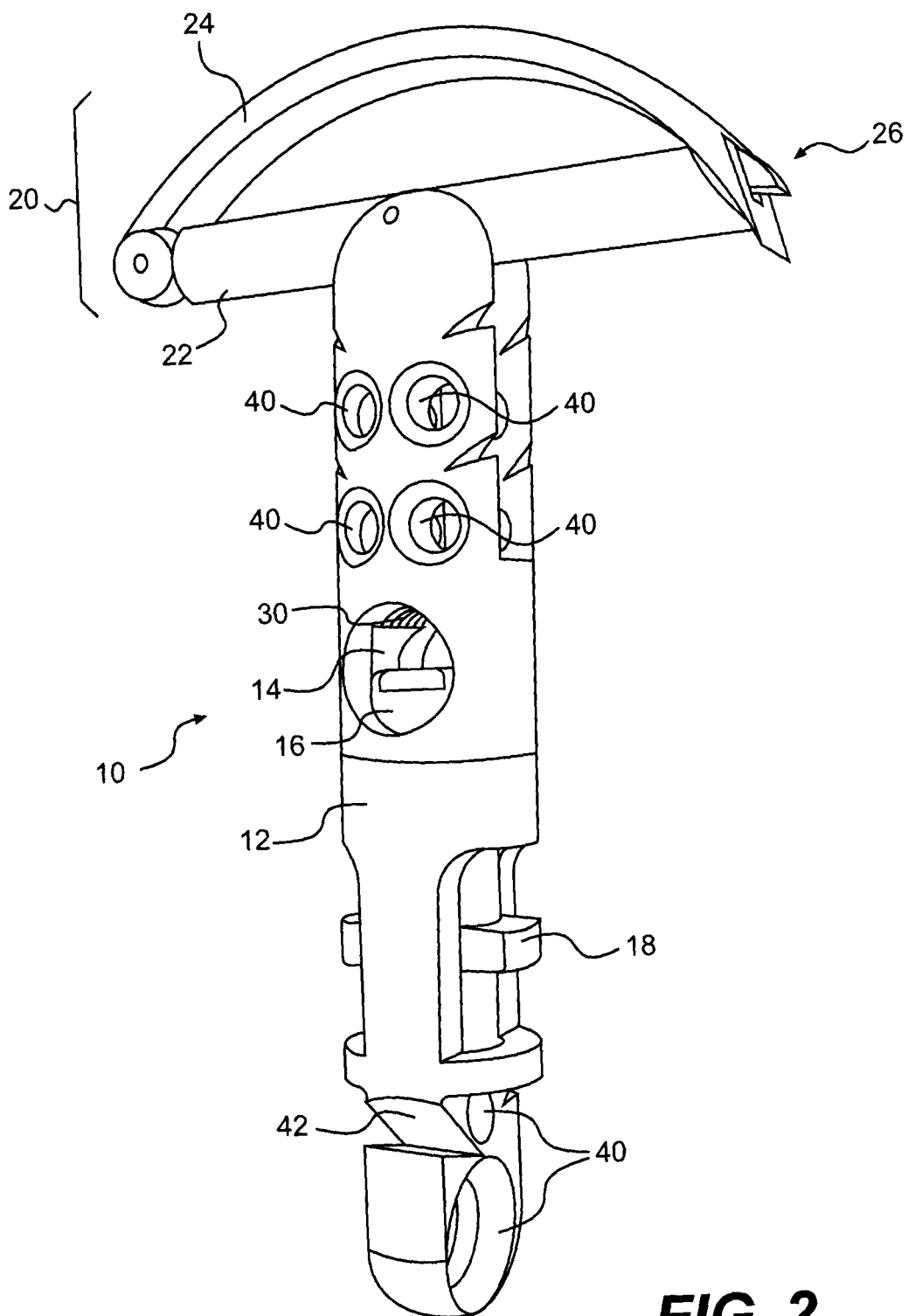
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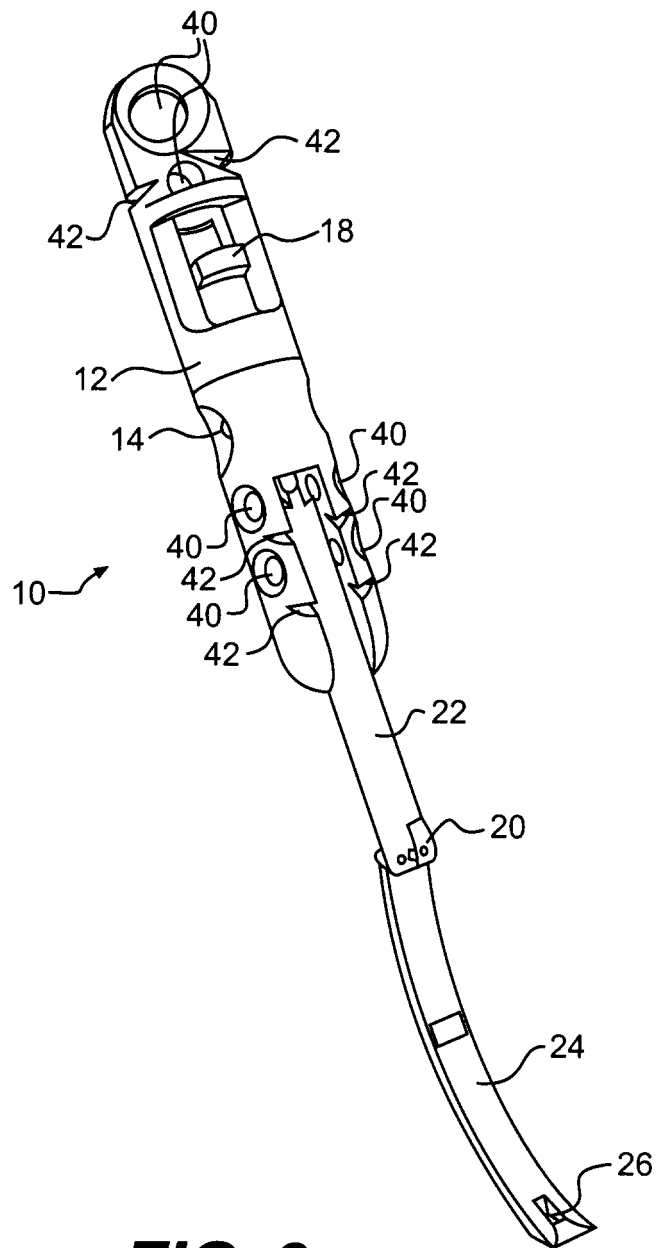
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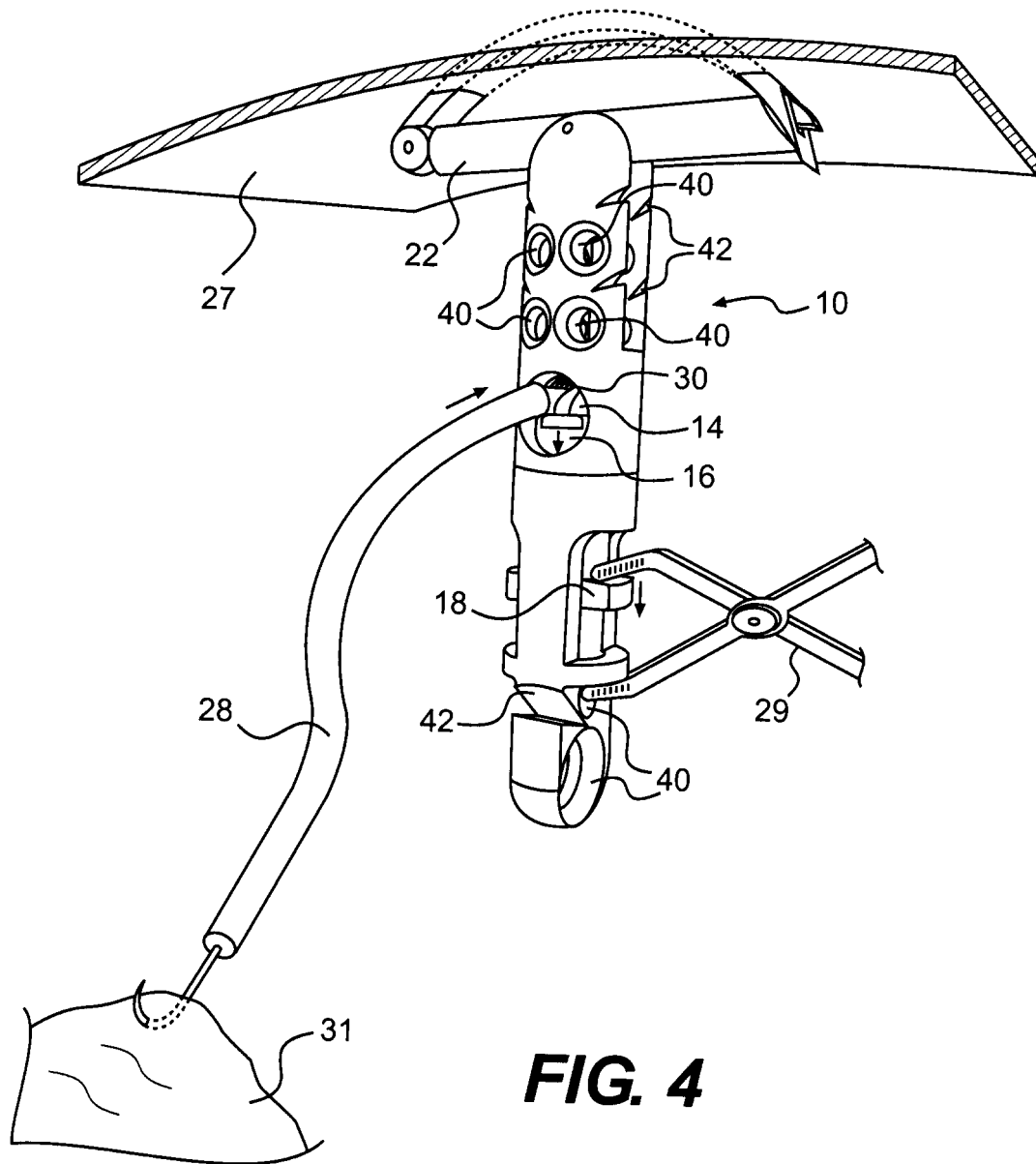
**FIG. 1**  
**PRIOR ART**



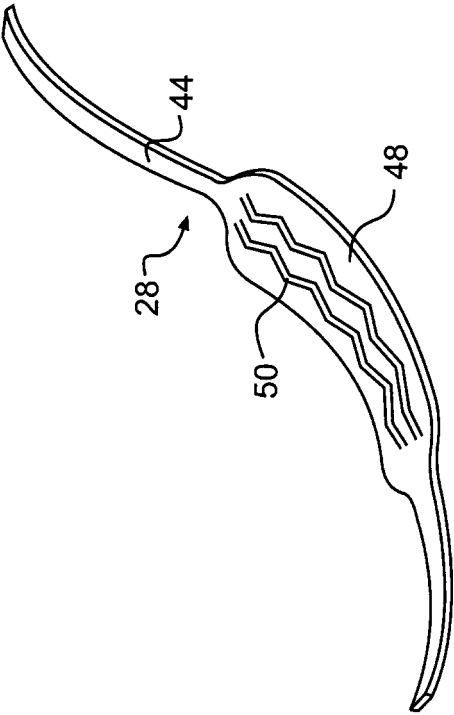
**FIG. 2**



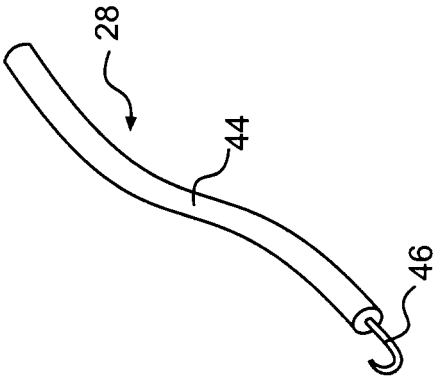
**FIG. 3**



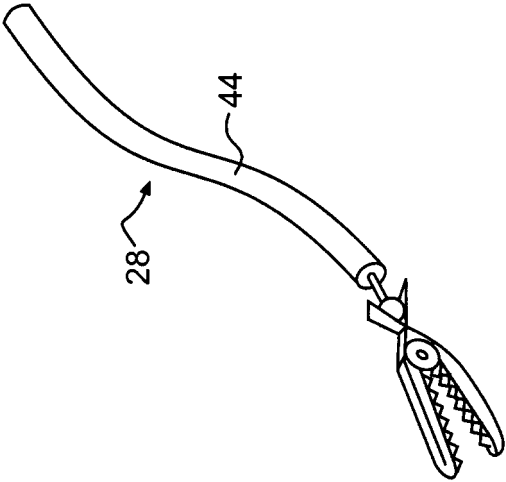
**FIG. 4**



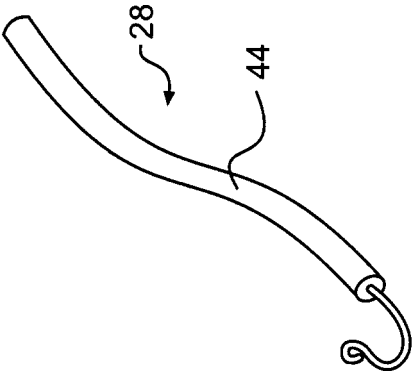
**FIG. 5B**



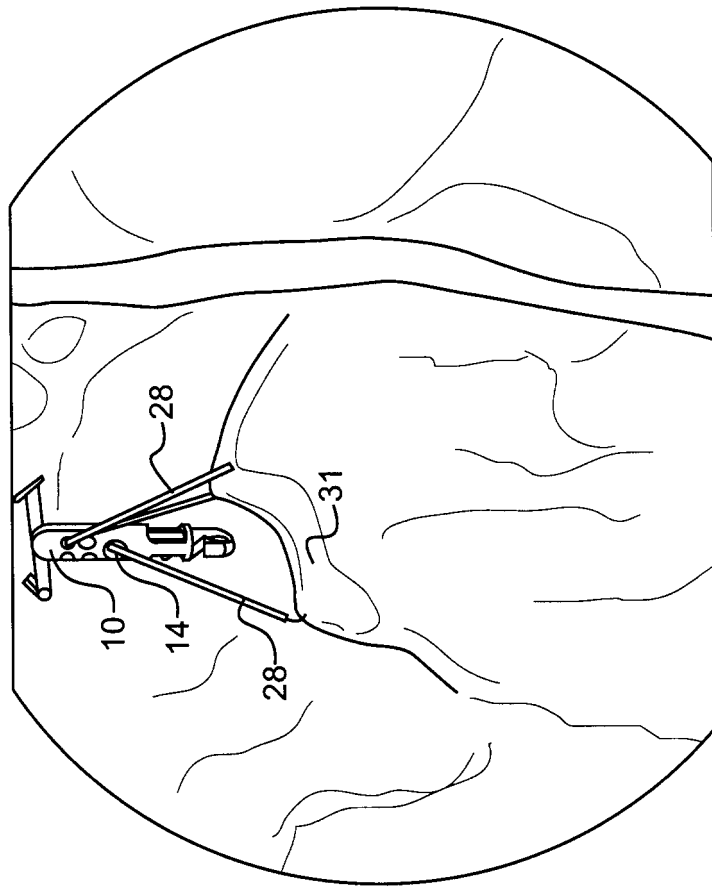
**FIG. 5A**



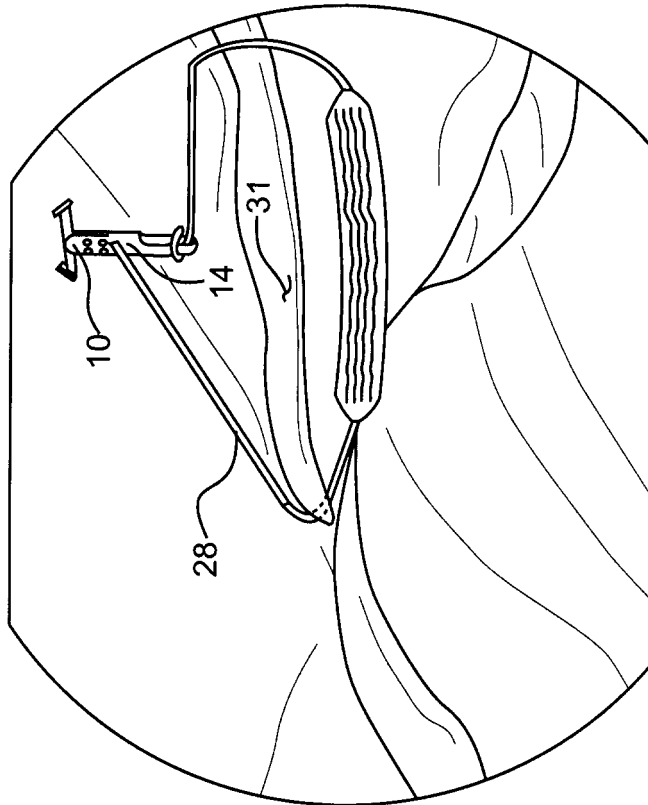
**FIG. 5D**



**FIG. 5C**



**FIG. 6**



**FIG. 7**

**REFERENCES CITED IN THE DESCRIPTION**

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|----------------|---------------------------------------------------------------------------------------------------------------------|---------|------------|
| 专利名称(译)        | 用于腹腔镜手术的腹腔镜工具和方法                                                                                                    |         |            |
| 公开(公告)号        | <a href="#">EP2391287A4</a>                                                                                         | 公开(公告)日 | 2015-11-04 |
| 申请号            | EP2009839054                                                                                                        | 申请日     | 2009-01-30 |
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| IPC分类号         | A61B17/94 A61B17/02 A61B17/04                                                                                       |         |            |
| CPC分类号         | A61B17/0218 A61B17/0401 A61B17/064 A61B17/122 A61B2017/0287 A61B2017/0446 A61B2017/0451 A61B2017/0459 A61B2017/0464 |         |            |
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| 其他公开文献         | EP2391287B1<br>EP2391287A1                                                                                          |         |            |
| 外部链接           | <a href="#">Espacenet</a>                                                                                           |         |            |

#### 摘要(译)

用于对患者的体内组织进行手术的腹腔镜工具。腹腔镜工具包括固定有附件的主体。主体具有用于固定兼容锚的主孔。附件具有连接到主体的支撑构件，以及连接到支撑构件的针部。针部分具有互锁机构以与支撑构件互锁。附件可从与主体对齐的第一位置展开，用于通过腹腔镜端口插入到与主体不对齐的第二位置，用于插入组织中并用于将工具锚固到组织。还公开了一种使用腹腔镜工具执行腹腔镜手术的方法，用于腹腔镜手术的腹腔镜工具的使用，以及包括腹腔镜工具和兼容锚的腹腔镜手术套件。