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(54) **INCISION FIXATION DEVICE FOR SINGLE SITE LAPAROSCOPY**

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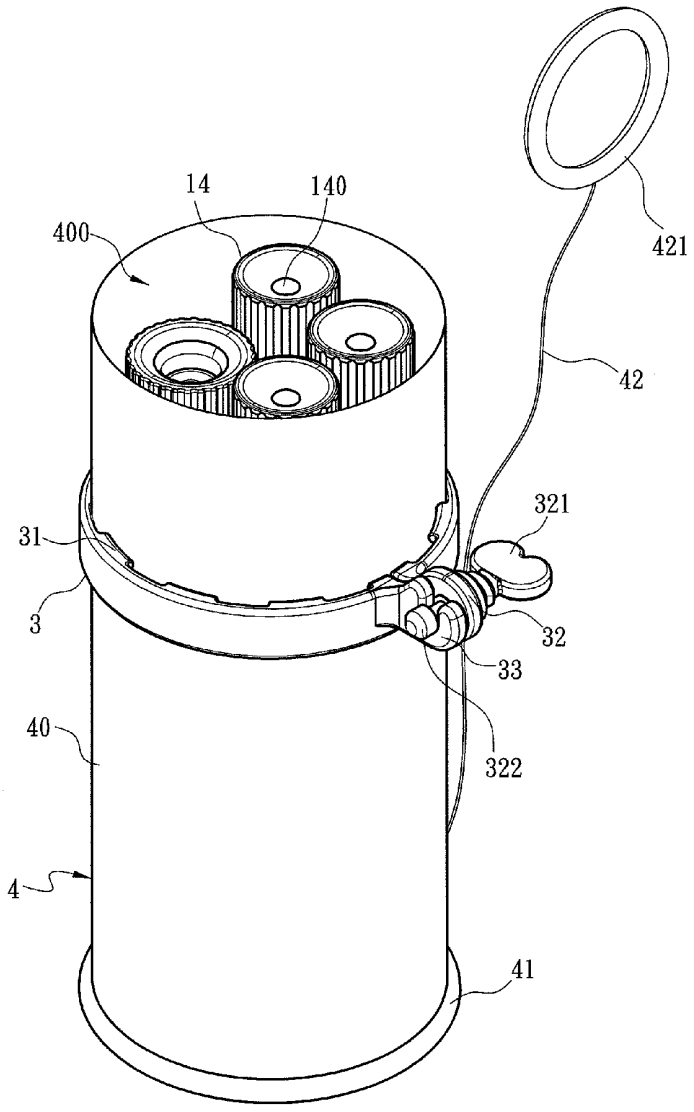
(57) **ABSTRACT**

An incision fixation device for single site laparoscopy is coupled with a sleeve to be positioned on a surgical incision. The sleeve has one isolation portion containing a passage. The fixation device includes a bracing member located in the passage, a compact member coupled to the isolation portion, and an upper lid containing a plurality of guiding portions and a second engaging portion. The bracing member has an anchor end and a first engaging portion. The compact member has at least one holding portion to hold the anchor end with the isolation portion interposed therebetween. The second engaging portion is releasably engaged with the first engaging portion. Each guiding portion has an instrument passage to guide a surgical instrument to pass through the surgical incision. The compact member has a first and a second fastening mechanisms that are movable against each other to press the anchor end and isolation portion.



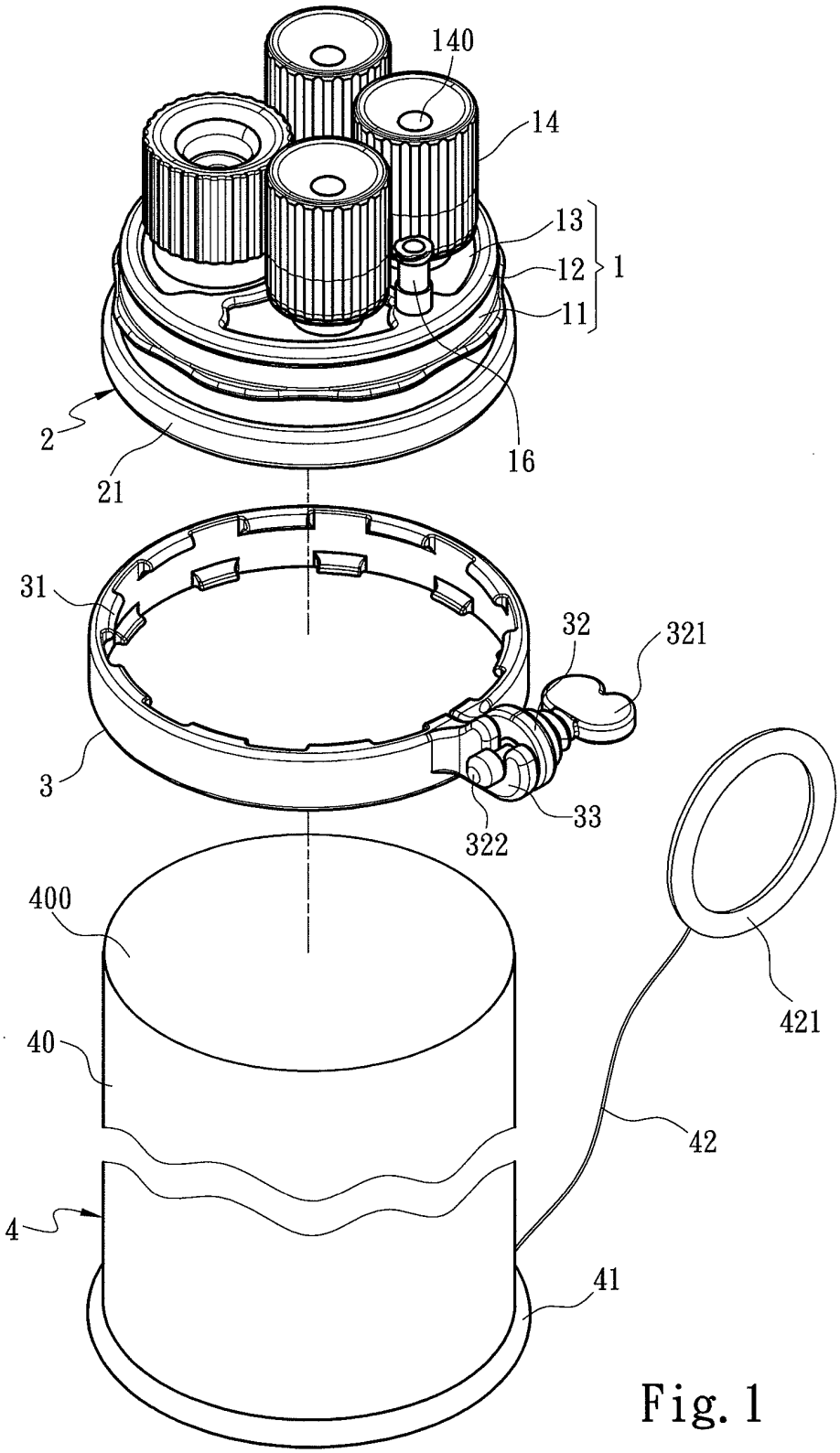


Fig. 1

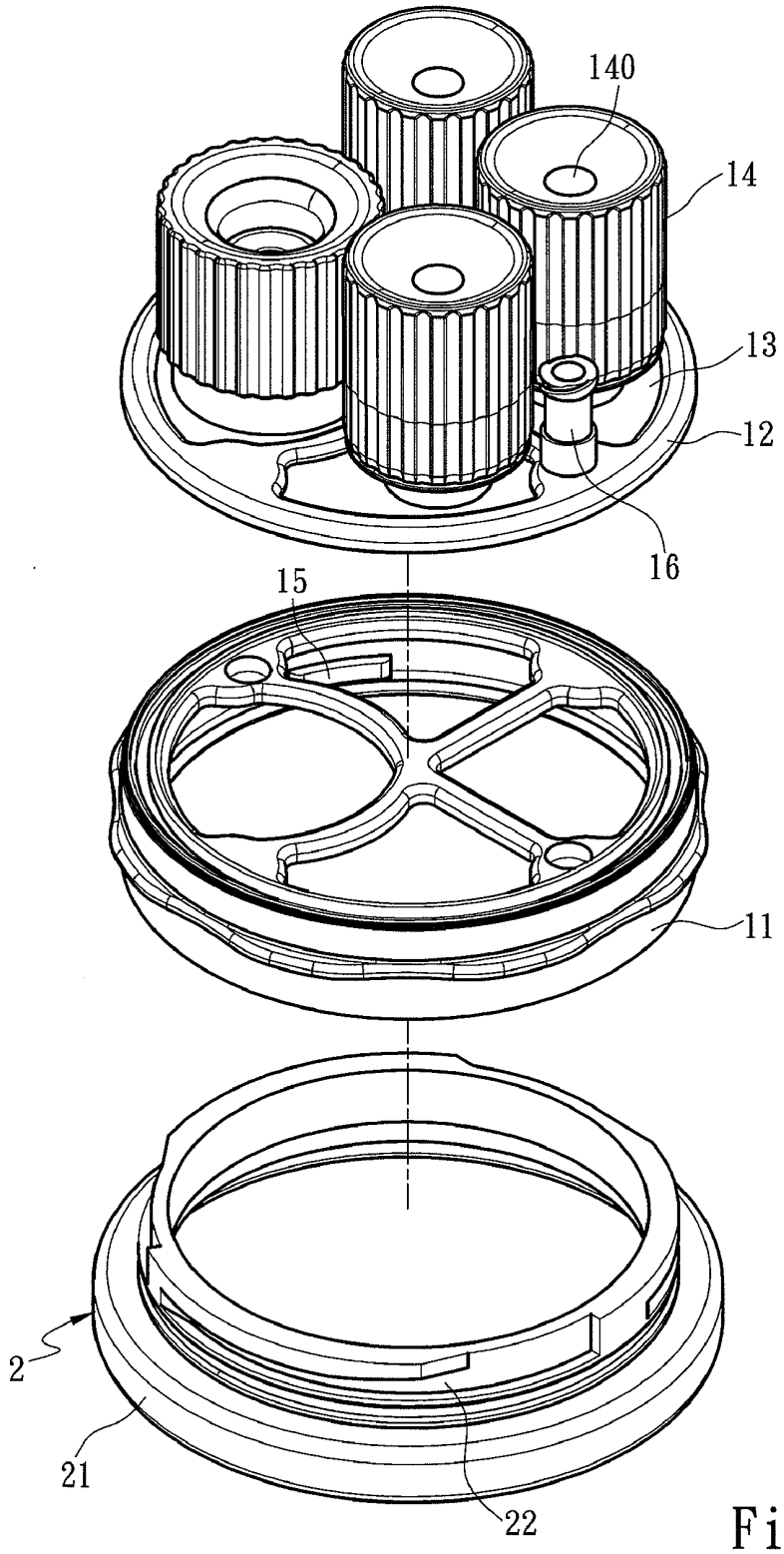


Fig. 2

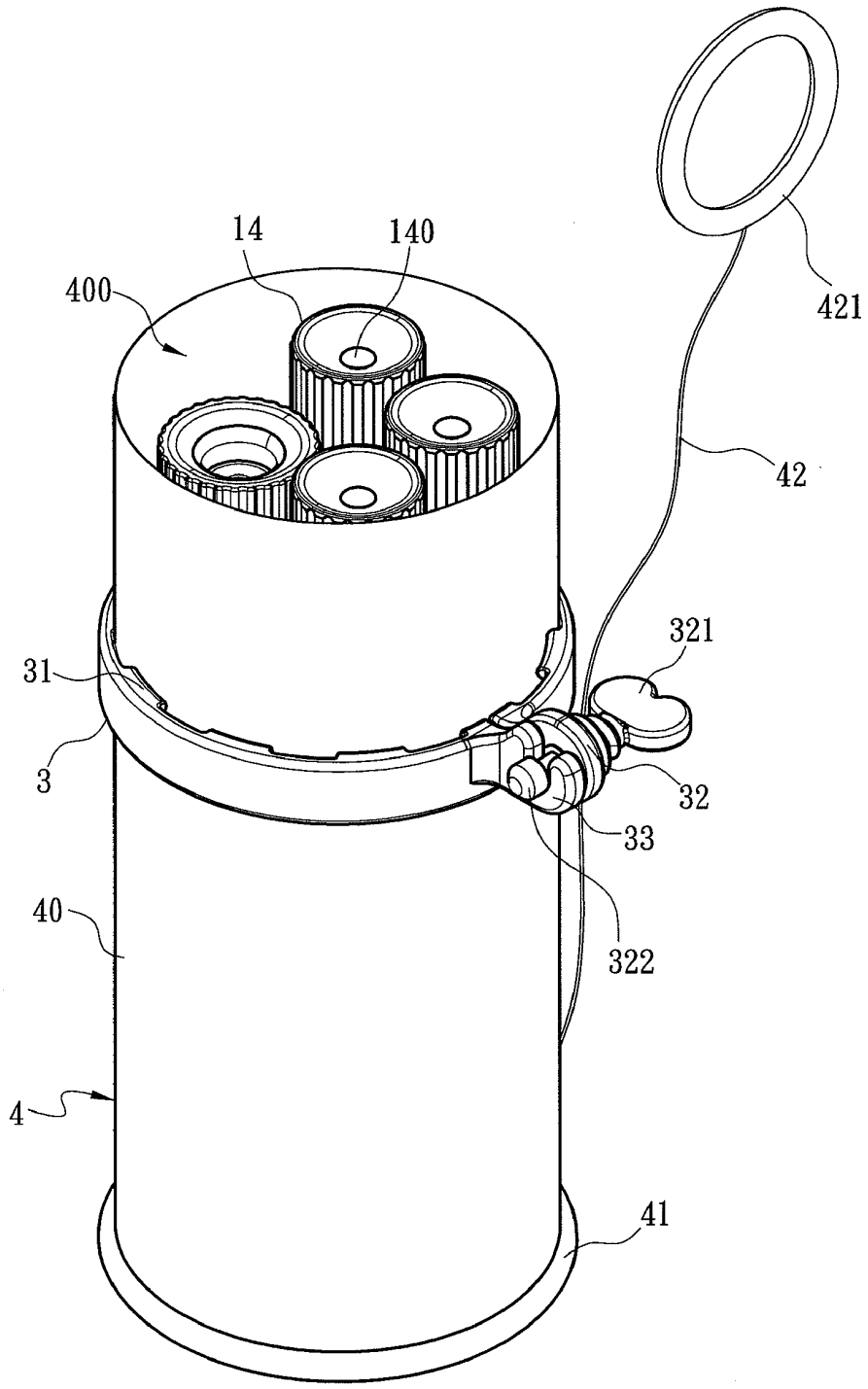


Fig. 3

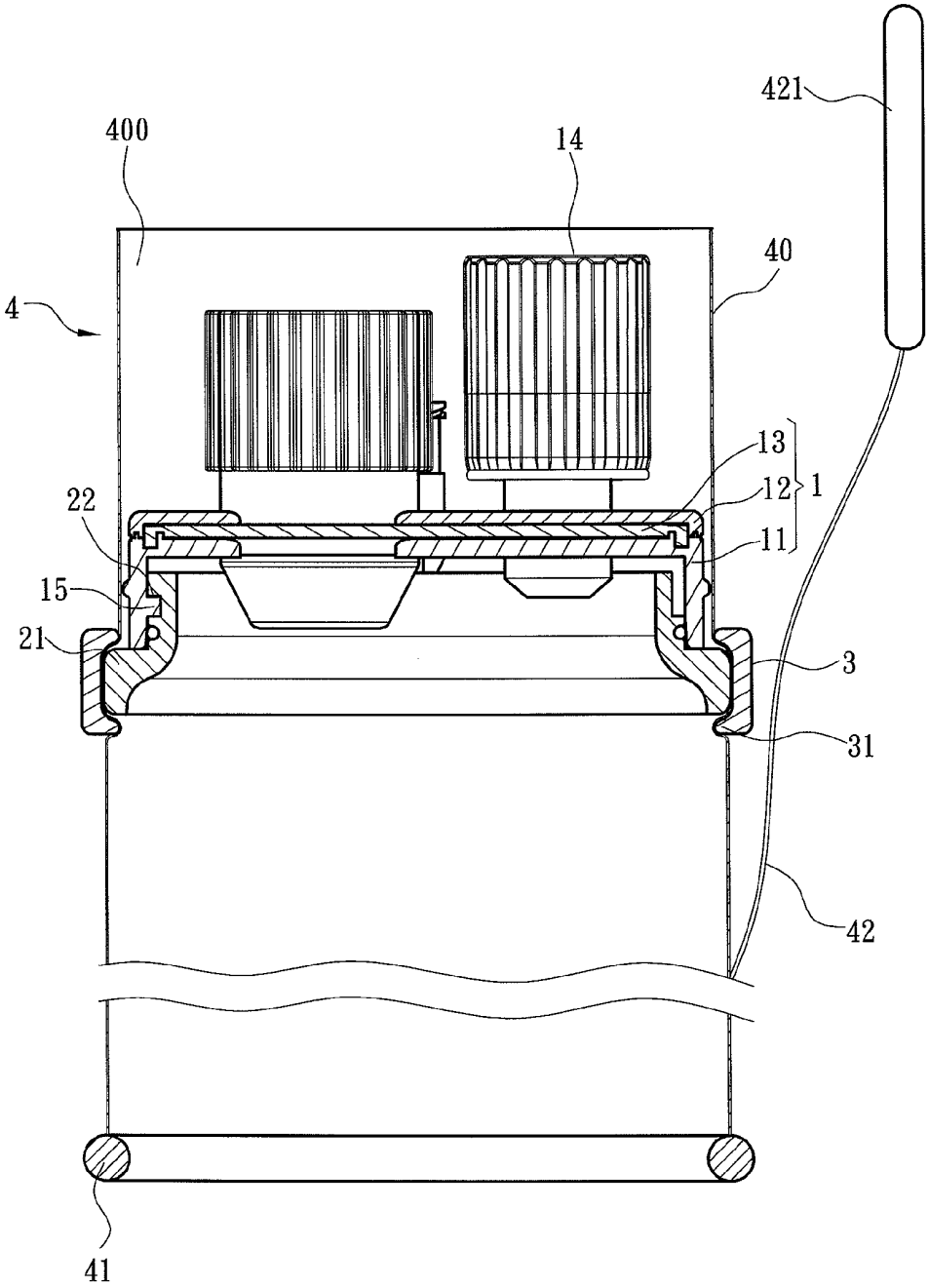


Fig. 4

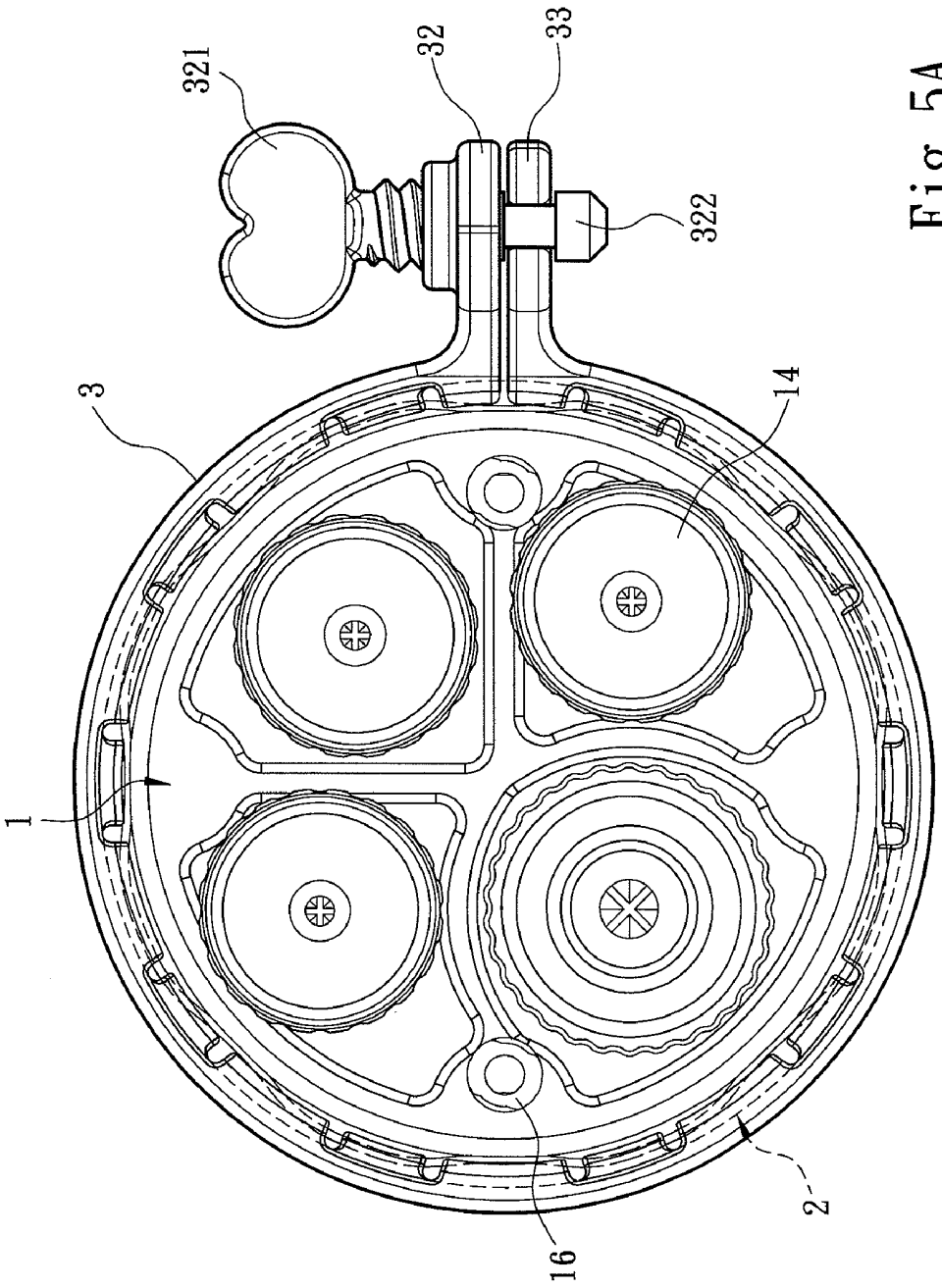


Fig. 5A

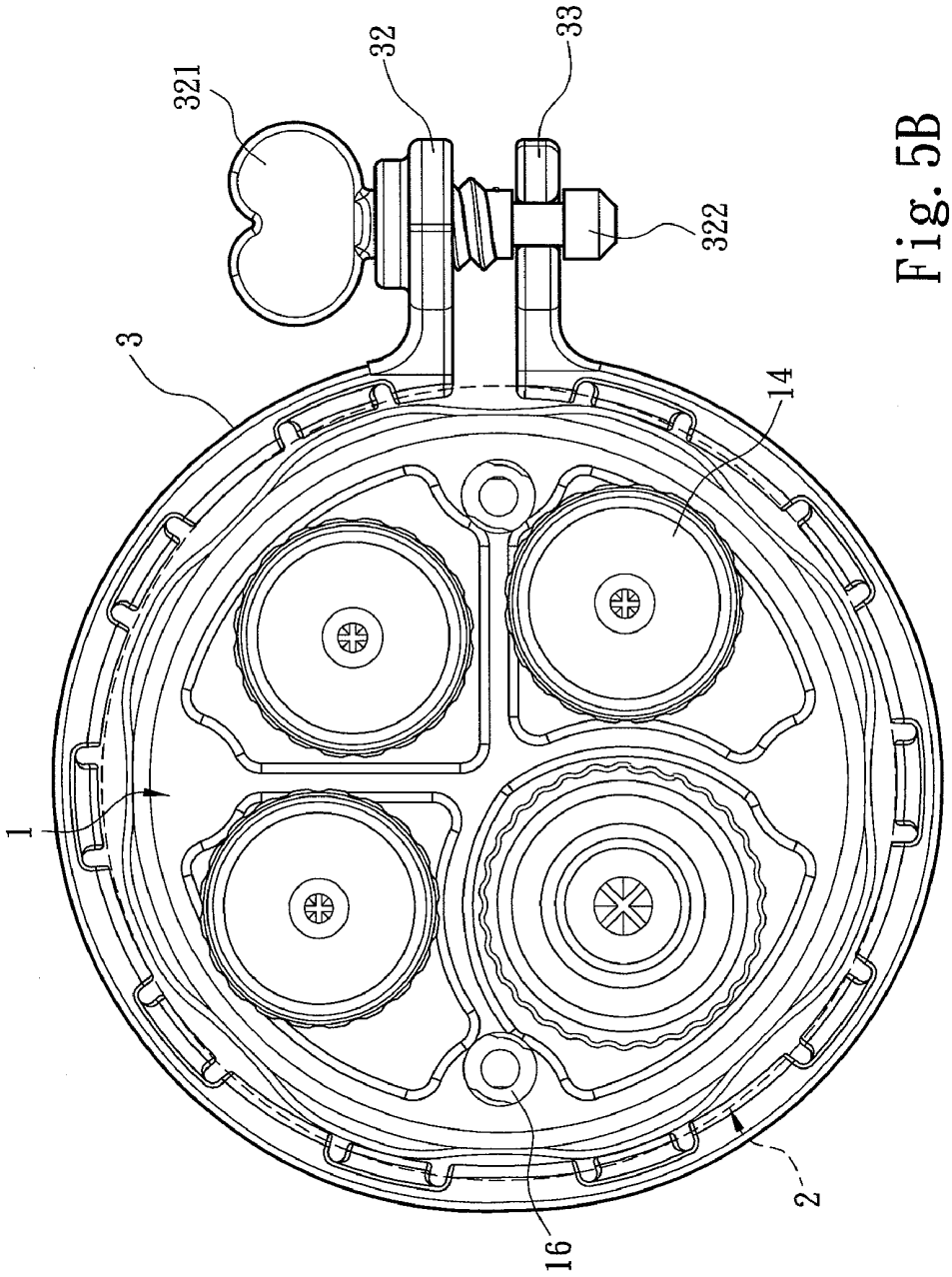


Fig. 5B

INCISION FIXATION DEVICE FOR SINGLE SITE LAPAROSCOPY

FIELD OF THE INVENTION

[0001] The present invention relates to an incision fixation device for single site laparoscopy and particularly to a device to guide a surgical instrument to pass through a surgical incision.

BACKGROUND OF THE INVENTION

[0002] In the past, a surgical operation was constrained by technology and equipment, and a large incision has to be made on a patient's body to perform the operation. Because of the large incision, a greater amount of patient's blood could be lost, more portions of patient's body are affected, and much time is needed to cure the wound.

[0003] With constant progress of technology and equipment, minimally invasive surgery has been gradually developed and widely applied to extensive fields in recent years. Equipment for such surgery also has a great deal of progress and improvements. For instance, R.O.C. publication No. 201041557 entitled "Multi-port mask apparatus for a single site laparoscope" discloses a mask apparatus for a laparoscopic surgical operation that includes a body and a head. The body includes a hollow sleeve which has a lower anchor portion, an upper anchor portion, and a pulling strip at the bottom of the hollow sleeve. The head has a gripping portion coupled on the outer side of the upper anchor portion and a holding portion connected to the gripping portion. The holding portion has a plurality of coupling ports. As shown in its drawings, before the mask apparatus is used in surgery, an incision has to be made on a patient's body; then the lower anchor portion of the sleeve is inserted into the incision with at least a portion of the hollow sleeve wedged inside the patient's body; by pulling the pulling strip, the lower anchor portion can be driven to butt the inner side of patient's abdomen. The upper anchor portion and most of the hollow sleeve are exposed outside the outer skin of patient's abdomen. To securely hold the upper anchor portion above the incision and prevent the rest of the hollow sleeve from hindering surgical operation, the hollow sleeve must be rolled upwards manually from the upper anchor portion as shown in its FIG. **7**. Finally, the head (gripping portion) is coupled to the upper anchor portion and the rolled hollow sleeve to position the head on the incision. Then various kinds of surgical instruments can be inserted into the abdominal cavity through the coupling ports to perform the surgical operation.

[0004] While the aforesaid prior art can brace the incision by positioning the hollow sleeve thereon to facilitate surgical operation, it still has drawbacks, notably:

[0005] 1. The extra length of the hollow sleeve has to be rolled up manually. It burdens the surgical operation in the operation room with insufficient human resources. Moreover, rolling the hollow sleeve creates unnecessary tearing on the incision that is unfavorable for curing after the surgery.

[0006] 2. After the hollow sleeve is positioned, the head is pushed to allow the gripping portion to latch on the upper anchor portion. But this also creates troublesome work for the medical personnel and unnecessary tearing on the incision as the head mounted onto the upper anchor portion.

[0007] 3. During the minimally invasive surgery, parts of body tissues might be resected and removed. However, the coupling ports of the head hinder the removal action, hence the head and upper anchor portion must be separated temporarily to remove the resected body tissues. As mentioned above, disassembly and assembly of the head cannot be easily done. During surgical operation, any unnecessary actions should be avoided. The aforesaid conventional technique creates such trouble for medical personnel involved.

[0008] 4. The lower anchor portion is connected to a pulling strip which has a certain width that could also tear the incision during pulling and create unnecessary injury to the incision.

[0009] All these show that there is still room for improvement.

SUMMARY OF THE INVENTION

[0010] In view of medical personnel are insufficiently staffed and have to bear heavy workload during surgery, and unnecessary actions have to be avoided to hurt the patient, and the conventional mask apparatus still leaves a lot to be desired when in use, such as inconvenient installation, incision tearing during the installation, and difficult removal of the resected tissues, the primary object of the present invention is to provide a surgical instrument that can be easily installed, and assembled or disassembled quickly.

[0011] The present invention provides an incision fixation device for single site laparoscopy coupled with a sleeve to be positioned on a surgical incision. The sleeve has at least one isolation portion which forms a passage. The fixation device includes a bracing member held in the passage, a compact member coupled to an outer side of the isolation portion, and an upper lid containing a plurality of guiding portions and a second engaging portion. The bracing member has an anchor end and a first engaging portion. The compact member has at least one holding portion on the inner rim to hold the anchor end with the isolation portion interposed therebetween. The second engaging portion is releasably engaged with the first engaging portion. Each guiding portion has an instrument passage communicating with the passage to guide a surgical instrument to pass through the surgical incision to perform the surgical operation. The compact member has two ends equipped respectively with a first fastening mechanism and a second fastening mechanism that are movable against each other to drive the compact member to contract inwards and press the anchor end and the isolation portion through the holding portion.

[0012] The fixation device thus formed can create tight coupling between the isolation portion and the anchor end or loosening thereof by fastening or loosening the compact member, thereby to determine the relative positions of the bracing member and upper lid against the isolation portion. Moreover, the upper lid and bracing member can be assembled or disassembled quickly. When removing the resected body tissues is required during a surgery, the upper lid can be disassembled to meet such purpose. The actions of assembly and disassembly do not apply force upon the incision, thus do not harm the incision. By means of aforesaid structure of the invention, procedures of installing the surgical instrument on the incision can be simplified, and the burden of medical personnel also can be reduced. In addition, removing the resected body tissues during surgery or assembly or disassembly of the fixation device does not produce significant tearing or pressure on the incision, thus can help patient to recover more quickly.

[0013] The foregoing, as well as additional objects, features and advantages of the invention will be more readily

apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. **1** is an exploded view of the incision fixation device of the invention.

[0015] FIG. **2** is an exploded view of the upper lid and bracing member.

[0016] FIG. **3** is a schematic view of the incision fixation device and the sleeve in a coupled condition.

[0017] FIG. **4** is a sectional view of the incision fixation device and the sleeve in a coupled condition.

[0018] FIG. **5**A is a schematic view of the first and second fastening mechanisms in a use condition.

[0019] FIG. **5**B is a schematic view of the first and second fastening mechanisms in another use condition.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] Please refer to FIG. **1**, the present invention aims to provide an incision fixation device for single site laparoscopy coupled to a sleeve **4** to be positioned on a surgical incision. The sleeve **4** has an isolation portion **40** and a butting portion **41** at a distal end of the isolation portion **40**. During surgical operation, in order to allocate space to facilitate insertion of a surgical instrument (not shown in the drawings) to pass through the surgical incision, the butting portion **41** is inserted through the surgical incision and butted against the inner side of the surgical incision. The inner side of the isolation portion **40** forms a passage **400** passing through the surgical incision. Through the passage **400**, surgeons can use the surgical instrument to pass through the surgical incision to perform the surgical operation. In an embodiment of the invention, the butting portion **41** is connected to a drawing rope **42** with a drawing portion **421** connected thereto. When the butting portion **41** is butted against a human body, parts of the drawing rope **42** and drawing portion **421** remain outside the human body, their functions will be discussed later. Also referring to FIGS. **1**, **2** and **3**, the fixation device includes an upper lid **1**, a bracing member **2** and a compact member **3**. The bracing member **2** has an anchor end **21** and a first engaging portion **22**. When the fixation device is coupled to the sleeve **4**, the bracing member **2** is held in the passage **400**, and the compact member **3** is coupled on an outer side of the isolation portion **40**. The compact member **3** has at least one holding portion **31** on the inner rim, and holds the anchor end **21** with the isolation portion **40** interposed therebetween. The compact member **3** has a first end and a second end that include respectively a first fastening mechanism **32** and a second fastening mechanism **33** coupled with each other to fasten or loosen the compact member **3**. Referring to FIGS. **5**A and **5**B, the second fastening mechanism **33** includes a screwing notch. The first fastening mechanism **32** includes a fastening bolt **321** screwed thereon and rotatably running through the screwing notch. The fastening bolt **321** has a latch end **322** latched on the second fastening mechanism **33**. The fastening bolt **321** can be screwed by wrenching to drive the first and second fastening mechanisms **32** and **33** to move against each other to drive the compact member **3** to contract inwards (as shown in FIG. **5**A) or expand outwards in reverse operation (as shown in FIG. **5**B). Referring to FIGS. **3** and **4**, the holding portion **31** of the compact member **3** holds the anchor end **21** with the isolation portion **40** interposed therebetween. Hence, when the compact member **3** is contracted inwards, the holding portion **31** also is contracted corresponding to the anchor end **21** to tightly clamp the isolation portion **40** between the anchor end **21** and the holding portion **31**. Therefore, the bracing member **2** and isolation portion **40** are held firmly against each other. On the other hand, when the compact member **3** is expanded outwards, a sliding space is formed between the anchor end **21** and the holding portion **31** for the isolation portion **40**, thereby the bracing member **2** can be moved relative to the isolation portion **40**. The upper lid **1** has a plurality of guiding portions **14**, at least one inflation port **16** and a second engaging portion **15**. The inflation port **16** is used to inflate patient's body to provide a room for surgical operation. The second engaging portion **15** is releasably engaged with the first engaging portion **22**. FIG. **2** illustrates an embodiment in which the second engaging portion **15** is a flange and the first engaging portion **22** is a track with an one-way opening corresponding to the flange, so that by rotating the upper lid **1**, the second engaging portion **15** can be entered into the first engaging portion **22** for engagement. Each guiding portion **14** has an instrument passage **140** to guide a surgical instrument. After the upper lid **1** is coupled with the bracing member **2** through the second engaging portion **15**, the instrument passage **140** communicates with the passage **400** to guide the surgical instrument to pass through the surgical incision to perform surgical operation. The instrument passage **140** also can hold a check member to enhance isolation. More specifically, the upper lid **1** can include a base **11**, a sealing member **12**, an airtight member **13** and the guiding portions **14** mentioned above. The airtight member **13** isolates the passage **400** from the exterior. The guiding portions **14** are located on the airtight member **13**. The circumference of the airtight member **13** is clamped and held securely between the coupled base **11** and sealing member **12**. The second engaging portion **15** is located on the base **11**. The airtight member **13** is preferably made of flexible plastics so that a slight movement space can be provided for the directing portions **14** wedged in the airtight member **13**. After surgical operation is finished, the compact member **3** is loosened to separate the upper lid **1**, the bracing member **2** and the compact member **3** from the isolation portion **40**, and the butting portion **41** can be removed by pulling the drawing rope **42**.

[0021] By means of the construction set forth above, when in use, the butting portion **41** at the distal end of the sleeve **4** is inserted through the surgical incision and butted against the inner side of a human body. Through loosening the compact member **3**, the upper lid **1**, the bracing member **2** and the compact member **3** can be slid on the isolation portion **40** to prospective locations desired by medical personnel; then the upper lid **1** and the bracing member **2** can be firmly positioned by contracting the compact member **3** through the first and second fastening mechanisms **32** and **33**. In short, by loosening or contracting the compact member **3**, the upper lid **1** and the bracing member **2** can be slid on the sleeve **4** to prospective locations to be adjusted as desired, thus resolve the problem of rolling the sleeve **4** in the conventional technique. It also improves the installation of the upper lid **1** and the bracing member **2**. Besides, when the resected tissues have to be removed, the upper lid **1** and bracing member **2** can be quickly disassembled and assembled again. As the upper lid **2** includes the guiding portions **14** for providing bracing forces, there is no need to use a trocar to guide the surgical instruments to pass through the surgical incision as the conven-

tional technique does. Without using extra trocar, the workload of medical personnel can be reduced. Moreover, the invention also provides the fine drawing rope **42** on the sleeve **4** to reduce unnecessary harm to the incision of the patient.

[0022] While the invention has been described by means of specific embodiments, they are not the limitations of the invention, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

[0023] In summation of the above description, the present invention provides a significant improvement over the conventional techniques and complies with the patent application requirements, and is submitted for review and granting of the commensurate patent rights.

What is claimed is:

1. An incision fixation device for single site laparoscopy coupled with a sleeve to be positioned on a surgical incision, the sleeve at least including an isolation portion to form a passage, the fixation device comprising:

a bracing member which is located in the passage and includes an anchor end and a first engaging portion;

a compact member which is coupled on an outer side of the isolation portion and includes at least a holding portion corresponding to the anchor end to be securely mounted onto the isolation portion of the sleeve; and

an upper lid which includes a plurality of guiding portions and a second engaging portion, the second engaging portion being releasably engaged with the first engaging portion, each guiding portion including an instrument passage communicating with the passage to guide a surgical instrument to pass through the surgical incision to perform surgical operation.

2. The incision fixation device of claim **1**, wherein the compact member includes a first end and a second end that include respectively a first fastening mechanism and a second fastening mechanism to couple with each other to drive the compact member to fasten or loosen.

3. The incision fixation device of claim **2**, wherein the second fastening mechanism includes a screwing notch, the first fastening mechanism including a fastening bolt screwed thereon and passed through the screwing notch to drive the first and second fastening mechanisms to contract inwards.

4. The incision fixation device of claim **1**, wherein the upper lid includes an airtight member to isolate the passage from the exterior, the guiding portions being located on the airtight member.

5. The incision fixation device of claim **4**, wherein the upper lid further includes a base and a sealing member, the base including the second engaging portion located thereon, the airtight member being located between the base and the sealing member.

6. The incision fixation device of claim **4**, wherein the airtight member is made of flexible plastics.

7. The incision fixation device of claim **1**, wherein the second engaging portion includes a flange, the first engaging portion including a track with an one-way opening corresponding to the flange, the upper lid being rotated to allow the second engaging portion to engage with the first engaging portion for positioning.

8. The incision fixation device of claim **1**, wherein the sleeve includes a butting portion at one end.

9. The incision fixation device of claim **8**, wherein the butting portion is connected to a drawing rope which includes a drawing portion.

* * * * *

专利名称(译)	单点腹腔镜切开固定装置		
公开(公告)号	US20120271117A1	公开(公告)日	2012-10-25
申请号	US13/091668	申请日	2011-04-21
[标]申请(专利权)人(译)	HSIEH金成		
申请(专利权)人(译)	HSIEH千石程		
当前申请(专利权)人(译)	HSIEH千石程		
[标]发明人	HSIEH CHIN CHENG		
发明人	HSIEH, CHIN-CHENG		
IPC分类号	A61B1/32		
CPC分类号	A61B1/3132 A61B2017/3445 A61B17/3423		
外部链接	Espacenet USPTO		

摘要(译)

用于单点腹腔镜检查的切口固定装置与套管连接以定位在手术切口上。套筒具有一个包含通道的隔离部分。固定装置包括位于通道中的支撑构件，连接到隔离部分的紧凑构件，以及包含多个引导部分和第二接合部分的上盖。支撑构件具有锚端和第一接合部分。紧凑构件具有至少一个保持部分，以保持锚定端部，隔离部分插入其间。第二接合部分可释放地与第一接合部分接合。每个引导部分具有仪器通道，以引导手术器械穿过手术切口。紧凑构件具有第一和第二紧固机构，所述第一和第二紧固机构可相对于彼此移动以按压锚端和隔离部分。