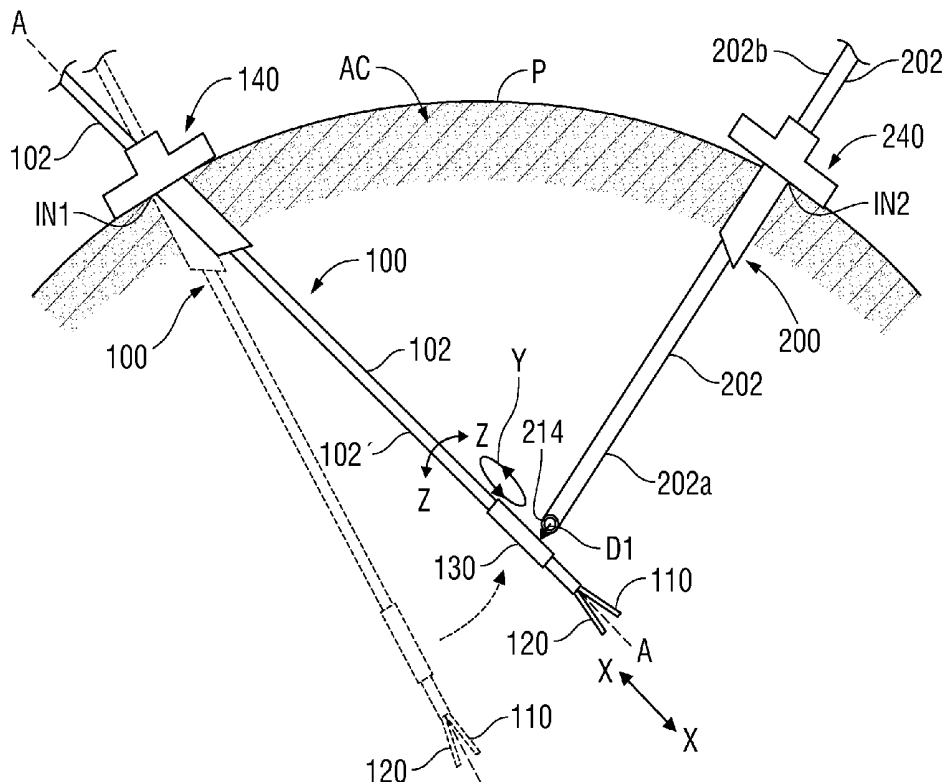




(43) **Pub. Date:** **Apr. 3, 2014**



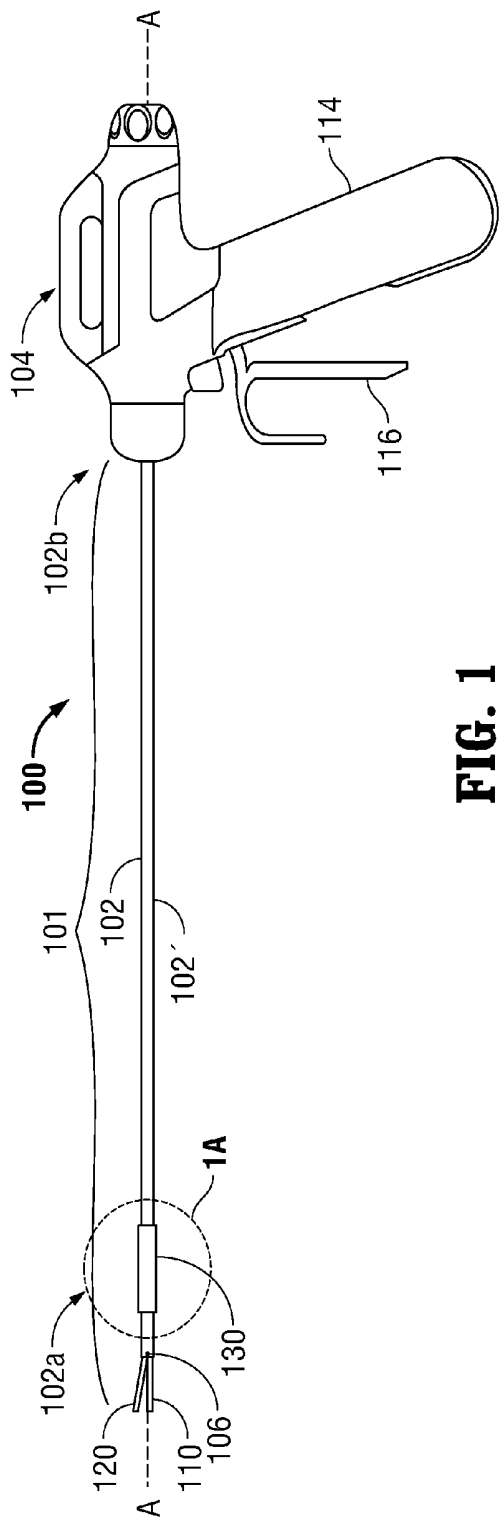


FIG. 1

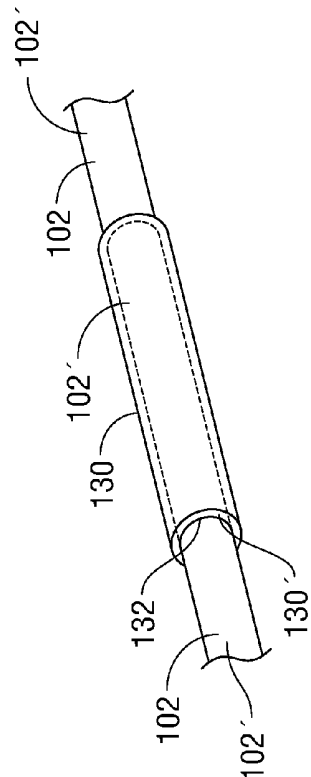


FIG. 1A

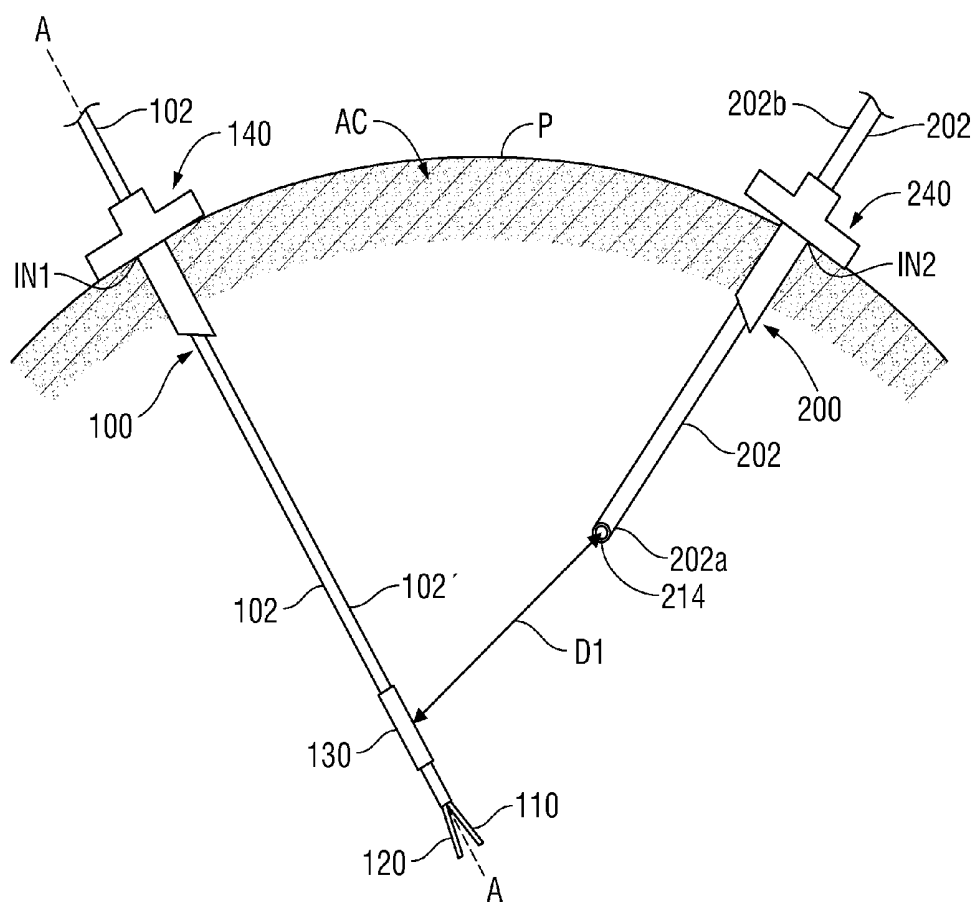


FIG. 2

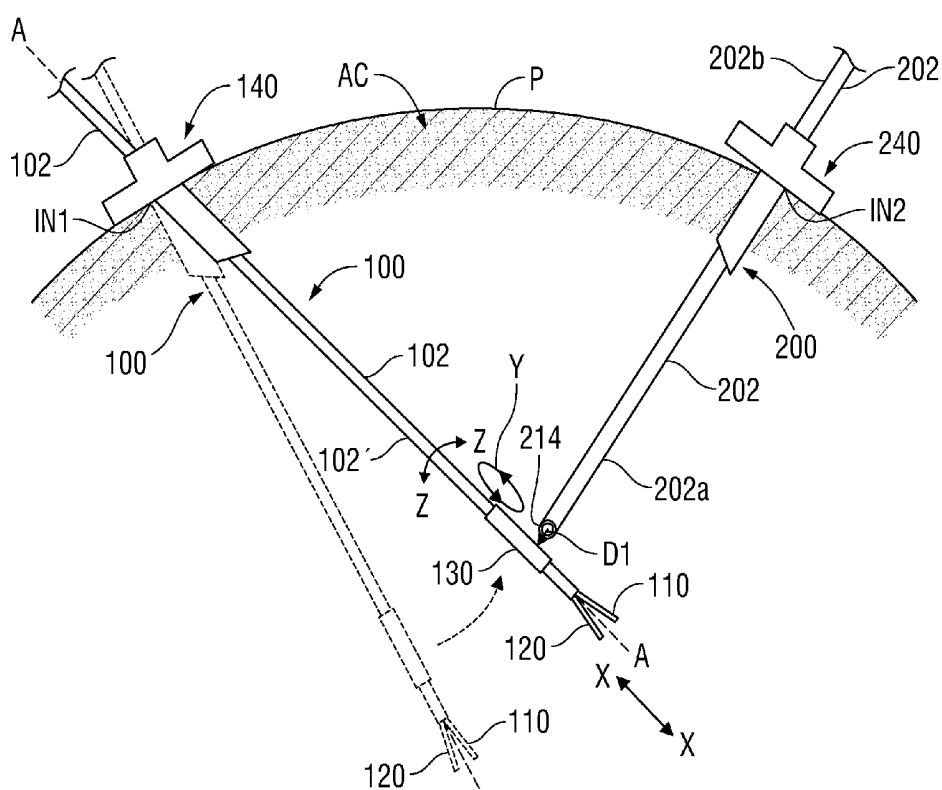


FIG. 3

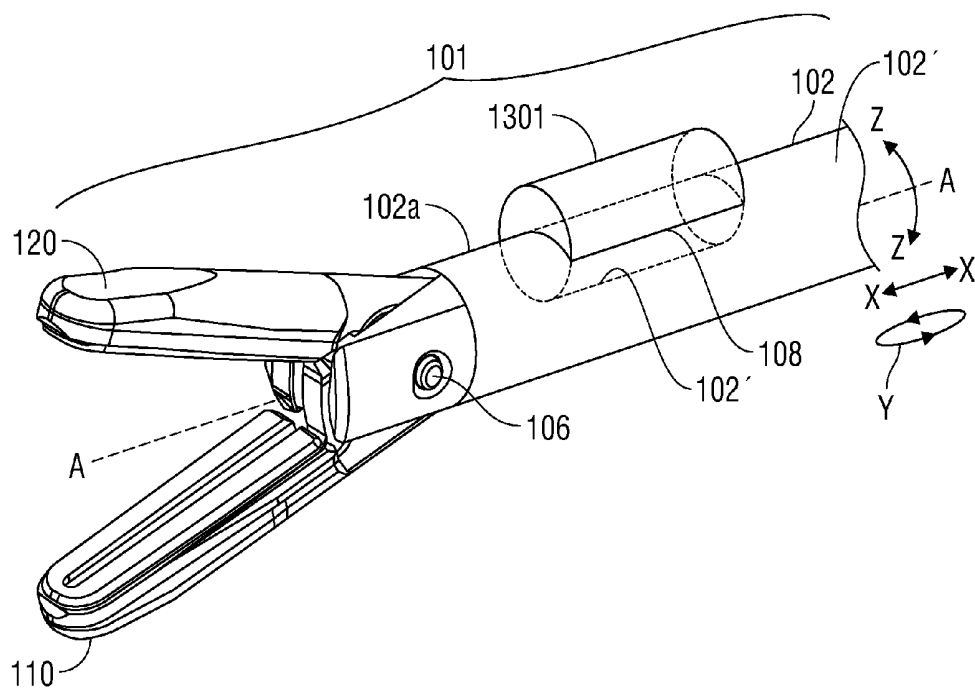


FIG. 4

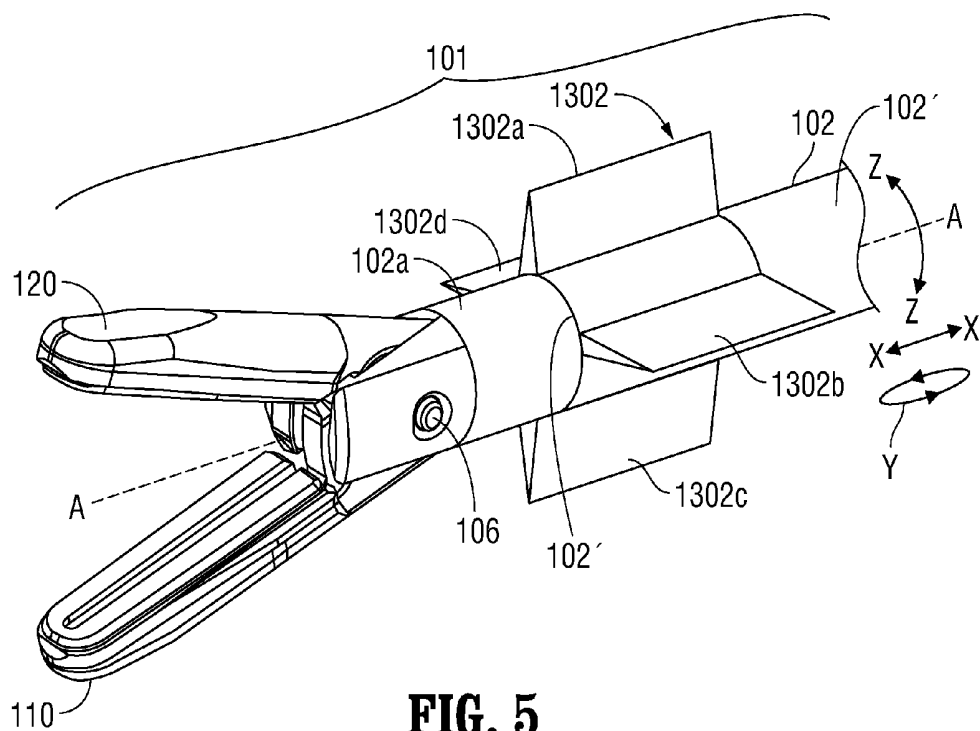


FIG. 5

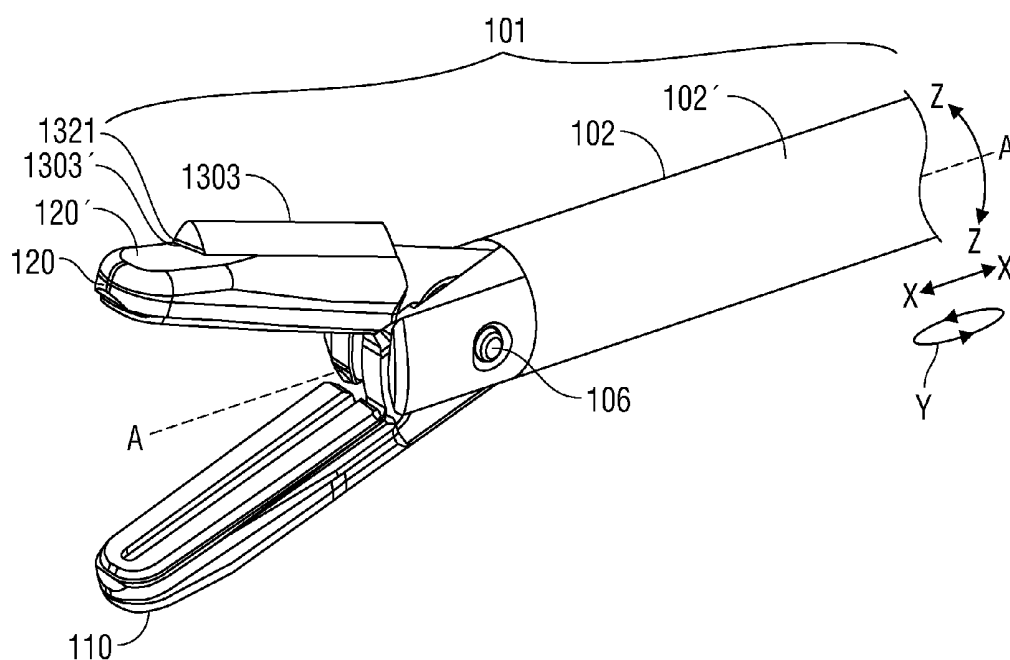


FIG. 6

**LAPAROSCOPIC LENS WIPE FEATURE ON
SURGICAL DEVICE SHAFT OR JAW
MEMBER**

**CROSS-REFERENCE TO RELATED
APPLICATIONS**

[0001] This application claims the benefit of and priority to U.S. Provisional Patent Application No. 61/708,677, filed Oct. 2, 2012, the entire disclosure of which is incorporated by reference herein

BACKGROUND

[0002] 1. Technical Field

[0003] This application relates to maintaining optical clarity of a surgical instrument.

[0004] 2. Description of Related Art

[0005] Known practices of cleaning a lens of a laparoscopic instrument scope involve removing the scope from the patient, wiping with a cloth, reinserting the scope, and then finding the proper location in the body again. This can occur multiple times during a procedure and increases overall procedure time as fog and/or smoke and/or bodily fluids often accumulate on the laparoscopic lens during a laparoscopic surgical procedure. Moreover, removing a device and reinserting increases infection risk, albeit a very small risk as this is performed in a sterile field. Surgeons typically must remove the laparoscope from the patient and lose time re-orienting themselves and their instruments to the operative site.

SUMMARY

[0006] To advance the state of the art with respect to maintaining optical clarity of a surgical instrument during a surgical procedure, the present disclosure relates to a first surgical instrument having a cleaning material configured to clean a second surgical instrument. More particularly, in one embodiment, the first surgical instrument includes a handle assembly defining a proximal end of the first surgical instrument and an extension member extending distally from the handle assembly and defining a distal end of the first surgical instrument. The extension member defines an external surface. The handle assembly is configured to enable a user to move the extension member. The improvement includes a cleaning material disposed on the external surface of the extension member at the distal end. The cleaning material is configured to clean at least a portion of a second surgical instrument in proximity to the first surgical instrument. The first surgical instrument and the second surgical instrument define a distance therebetween. The cleaning material is configured to clean at least a portion of the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0007] In one embodiment, the extension member is a shaft having a pair of jaw members at a distal end of the shaft. The jaw members are movable about a pivot from a first position wherein the jaw members are disposed in spaced relation relative to one another to a at least a second position wherein the jaw members are closer to one another for grasping tissue. The first surgical instrument is configured to enable a user to move the shaft and the pair of jaw members. The shaft and the jaw members each define external surfaces. The first surgical instrument includes a cleaning material disposed on the external surface of at least one jaw member or disposed on the external surface of the shaft.

[0008] The cleaning material may be disposed on the distal end of the shaft in proximity to the pair of jaw members. The second surgical instrument may be a laparoscopic instrument including a lens surface and the cleaning material is configured to clean at least a portion of the lens of the laparoscopic instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0009] In one embodiment, the cleaning material may be adhered to the extension member, e.g., at least one jaw member or the shaft, via an adhesive adhering a surface of the cleaning material to the external surface of the extension member, e.g., to the external surface of the at least one jaw member or to the external surface of the shaft respectively.

[0010] In one embodiment, the extension member, such as the shaft, defines a depression therein and the cleaning material is disposed in the depression in the extension member.

[0011] In yet another embodiment, the cleaning material includes a blade-like structure. The blade-like structure may be configured to clean at least a portion of the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced. The blade-like structure may be formed from a flexible material. The flexible material may be made from one of cloth, rubber or silicone. In one embodiment, when the second surgical instrument is a laparoscopic instrument including a lens surface, the blade-like structure may be configured to clean at least a portion of the lens of the laparoscopic instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0012] In one embodiment, the extension member defines a longitudinal axis and the first surgical instrument may be configured to reciprocally move in the direction of the longitudinal axis to enable the cleaning material to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0013] In still another embodiment, the first surgical instrument may be configured to enable the cleaning material to move in a curved path to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0014] In yet another embodiment, the extension member defines a longitudinal axis and the first surgical instrument may be configured to rotate the cleaning material around the longitudinal axis to enable the cleaning material to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0015] The present disclosure relates also to a method of cleaning at least a portion of a second surgical instrument in proximity to a first surgical instrument. In one embodiment, the first surgical instrument includes a handle assembly and an extension member that extends distally from the handle assembly. The method includes disposing a cleaning material on an external surface of the extension member; positioning the first surgical instrument in proximity to a second surgical instrument to define a distance between the first and second surgical instruments; reducing the distance between the first surgical instrument and the second surgical instrument; and cleaning at least a portion of the second surgical instrument with the cleaning material when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0016] In one embodiment, the extension member is a shaft having a pair of jaw members at a distal end thereof. The jaw members are movable about a pivot from a first position wherein the jaw members are disposed in spaced relation relative to one another to at least a second position wherein the jaw members are closer to one another for grasping tissue. The step of disposing the cleaning material includes disposing the cleaning material on an external surface of the shaft or an external surface of at least one jaw member. The step of disposing the cleaning material includes disposing the cleaning material on the external surface of the shaft at the distal end of the shaft in proximity to the pair of jaw members.

[0017] In one embodiment, the second surgical instrument is a laparoscopic instrument including a lens surface and the method includes cleaning at least a portion of the lens of the laparoscopic instrument with the cleaning material when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0018] In one embodiment, the step of disposing the cleaning material may include adhering the cleaning material to the external surface of the extension member, e.g., to the external surface of at least one jaw member or to the external surface of the shaft, via an adhesive adhering a surface of the cleaning material to the external surface of the extension member.

[0019] In one embodiment, the extension member defines a depression therein and the step of disposing the cleaning material may include disposing the cleaning material in the depression in the extension member.

[0020] In yet another embodiment, the step of disposing the cleaning material on an external surface of the extension member includes disposing a cleaning material having a blade-like structure, and the step of cleaning at least a portion of the second surgical instrument with the cleaning material when the distance between the first surgical instrument and the second surgical instrument is reduced may include cleaning at least a portion of the second surgical instrument with the cleaning material having a blade-like structure.

[0021] In one embodiment, the second surgical instrument is a laparoscopic instrument including a lens surface, and the method includes cleaning at least a portion of the lens of the laparoscopic instrument with the cleaning material having a blade-like structure.

[0022] In yet another embodiment, the extension member defines a longitudinal axis, and the method includes the step of reciprocally moving the first surgical instrument in the direction of the longitudinal axis such that the cleaning material cleans the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0023] In one embodiment, the step of cleaning may include moving the cleaning material in a curved path to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

[0024] In yet another embodiment, the extension member defines a longitudinal axis and the step of cleaning includes rotating the cleaning material around the longitudinal axis such that the cleaning material cleans the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Various embodiments will be described herein below with reference to the drawings wherein:

[0026] FIG. 1 is a side view of surgical instrument having a cleaning material disposed on a shaft of the instrument according to one embodiment of the present disclosure;

[0027] FIG. 1A is a detailed view of the cleaning material of FIG. 1 disposed on the shaft;

[0028] FIG. 2 is a cross-sectional view of the abdominal cavity of a patient in which the surgical instrument of FIG. 1 having a cleaning material disposed on a shaft of the instrument is inserted into the abdominal cavity in proximity to a second surgical instrument having a lens which can be cleaned by the cleaning material;

[0029] FIG. 3 is cross-sectional view of the abdominal cavity of FIG. 2 in which the cleaning material is in position to directly contact and clean the lens of the second surgical instrument;

[0030] FIG. 4 is a perspective view the shaft of the surgical instrument of FIG. 1 wherein the shaft defines a depression therein and wherein the cleaning material is disposed in the depression in the shaft according to one embodiment of the present disclosure;

[0031] FIG. 5 is a perspective view of the shaft of the surgical instrument of FIG. 1 wherein the cleaning material has a blade-like configuration according to one embodiment of the present disclosure; and

[0032] FIG. 6 is a perspective view of jaw members of the surgical instrument of FIG. 1 surgical instrument having a cleaning material disposed on a jaw member of the instrument.

DETAILED DESCRIPTION

[0033] The embodiments of the present disclosure relate to a surgical instrument having a cleaning material that is disposed on a shaft or on a jaw member of a first surgical instrument in which the cleaning material is configured to clean at least a portion of at least a second surgical instrument in proximity to the first surgical instrument. The embodiments of the present disclosure advance the state of the art of surgical procedures by speeding procedure time, by requiring fewer steps for cleaning, and by lowering the risk of infection.

[0034] The surgical instrument having a cleaning material according to the embodiments of the present disclosure eliminates time costly steps by incorporating a laparoscopic wipe feature on the shaft of a commonly used laparoscopic surgical instrument such as a radio frequency (RF) sealer/divider, manufactured by Covidien, Inc (Boulder, Colo., USA) under the trademark LIGASURE™ or an ultrasonic dissector, manufactured by Covidien, Inc. (Boulder, Colo., USA) under the trademark SONICISION™.

[0035] The cleaning material or wipe may be made from a material that is felt-like and adhered to the shaft of the device near the jaws. Other material options include rubbers/silicones that behave similarly to windshield wipers.

[0036] It is worthy to note that any reference in the specification to “one embodiment” or “an embodiment” means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. The appearances of the phrase “in one embodiment” in various places in the specification are not necessarily all referring to the same embodiment.

[0037] Turning now to FIG. 1, there is disclosed an exemplary first surgical instrument 100 that includes a handle assembly 104. An extension member 101 extends distally from the handle assembly 104 to define a proximal end 102b and a distal end 102a of the first surgical instrument 100. The extension member 101 defines an external surface 102'. In the exemplary embodiment of FIG. 1, the handle assembly 104

may include a handle **114** that includes a movable trigger or actuator **116** on a distal side of the handle **114**.

[0038] More particularly, as shown in the exemplary embodiment of FIG. 1, the first surgical instrument is an electrosurgical forceps wherein the extension member **101** includes a shaft **102** having a pair of jaw members, e.g., lower jaw member **110** and upper jaw member **120**, at distal end **120a** of the shaft **102**. The jaw members **110** and **120** are movable about a pivot **106** from a first position wherein the jaw members **110** and **120** are disposed in spaced relation relative to one another, as shown in FIG. 1, to a second position wherein the jaw members **110** and **120** are closer to one another (not shown) for grasping tissue (not shown). In the example herein of an electrosurgical forceps, at least one jaw member **110** and/or **120** is adapted to connect to a source of electrical energy (not shown) and such that the jaw members **110** and **120** are capable of conducting energy to tissue held between the jaw members **110** and **120**. The movable trigger or actuator **116** actuates a drive assembly, included within shaft **102**, to move the jaw members **110** and **120** relative to one another.

[0039] As can be appreciated from the foregoing, the first surgical instrument **100** is configured to enable a user, e.g., a surgeon or a remotely controlled machine (neither of which are shown), to move the shaft **102** and the pair of jaw members **110** and **120**.

[0040] As illustrated in FIG. 1A, in one embodiment, a cleaning material **130** may be adhered to the shaft **102** via an adhesive **132** adhering a surface **130'** of the cleaning material **130** to external surface **102'** of the extension member **101** as represented by the shaft **102**. **11**. The cleaning material may be made from cloth, rubber or silicone or other suitable material.

[0041] In conjunction with FIG. 2, the cleaning material **130** is disposed on the shaft **102** in proximity to the distal end **102a**. The shaft **102** and the jaw members **110** and **120** of the first surgical instrument **100** are disposed through a first trocar **140** that penetrates a first incision **IN1** into the abdominal cavity **AC** in a patient **P**.

[0042] At least a second exemplary surgical instrument **200** includes a shaft **202** having a distal end **202a** and a proximal end **202b**. The distal end **202a** of the shaft **202** is disposed through a second trocar **240** that penetrates a second incision **IN2** into the abdominal cavity **AC** of the patient **P**. The second surgical instrument **200** may be inserted through the second trocar **240** via a movable handle (not shown) that may be disposed in the vicinity of the proximal end **202b** of the shaft **202**. The first surgical instrument **100** and the second surgical instrument **200** are positioned through the first and second incisions **IN1** and **IN2** at an angle with respect to each other to define a variable distance **D1** between the distal end **102a** of the first surgical instrument **100** and the distal end **202a** of the second surgical instrument **200**.

[0043] Turning now to FIG. 3, when the variable distance **D1** is reduced sufficiently, such as by moving either handle **104** of the first surgical instrument **100** or the movable handle of the second surgical instrument **200** or both, the cleaning material **130** is moved into position in proximity to the distal end **202a** of the second surgical instrument **200** to contact the second surgical instrument **200** such that the cleaning material **130** is thus configured to clean at least a portion of the second surgical instrument **200**.

[0044] As illustrated in FIGS. 2 and 3, the exemplary second surgical instrument **200** is a laparoscopic instrument that

includes a lens surface **214** disposed at the distal end **202a** of the shaft **202**. As illustrated in FIGS. 1, 2 and 3, the extension member **101**, as represented by shaft **102**, defines a longitudinal axis **A-A** such that the shaft **102** can move in multiple directions to enable the cleaning material **130** to clean the second surgical instrument **200**, and more particularly in the exemplary embodiment of FIGS. 2 and 3, the lens **214** of the second or laparoscopic instrument **200**.

[0045] In one embodiment, the first surgical instrument **100** can be reciprocally moved, and thus is configured to reciprocally move, in the direction of the longitudinal axis **A-A** as shown by the double-headed arrow **X** to enable the cleaning material **130** to clean the second surgical instrument **200** when the distance **D1** is reduced sufficiently as described above.

[0046] In one embodiment, the first surgical instrument **100** can be moved in a curved path, and thus is configured to move in a curved path, as shown by the curved path **Y** to enable the cleaning material **130** to move in the curved path **Y** to clean the second surgical instrument **200** when the distance **D1** is reduced sufficiently again as described above.

[0047] The first surgical instrument **100** can also be caused to rotate the cleaning material **130** around the longitudinal axis **A-A**, and thus the first surgical instrument **100** is configured to rotate the cleaning material **130** around the longitudinal axis **A-A**, as shown by the double-headed circular arrow **Z** to enable the cleaning material **130** to clean the second surgical instrument **200** when the distance **D1** is reduced sufficiently as described above. The rotation of the cleaning material **130** may be effected by rotation of the shaft **102** around the longitudinal axis **A-A**.

[0048] As can be appreciated by those skilled in the art, by means of the aforementioned means of motion of the cleaning material **130**, the cleaning material **130** is thus also configured to clean at least a portion of the lens **214** of the second or laparoscopic instrument **200** when the distance **D1** between the first surgical instrument **100** and the second surgical instrument **200** is reduced sufficiently as described above.

[0049] FIG. 4 illustrates one embodiment of the present disclosure wherein the extension member **101** represented by the shaft **102** defines a depression **108** in external surface **102'** in proximity to distal end **102a** and a cleaning material **1301** is disposed in the depression **108** in the shaft **102** to enable more secure retention of the cleaning material **1301** within the depression **108** and attachment to the shaft **102** during a surgical procedure. As before, the cleaning material **1301** may be formed from a flexible material such as cloth, rubber or silicone.

[0050] Although the cleaning material **1301** may be moved in the **X** and/or **Y** directions described above with respect to FIG. 3, the cleaning material **1301** is particularly suitable for rotational motion in the **Z** direction as also described above with respect to FIG. 3. Thus, the cleaning material **1301** is configured to clean at least a portion of the second surgical instrument **200** when the distance **D1** between the first surgical instrument **100** and the second surgical instrument **200** is reduced sufficiently as described above.

[0051] FIG. 5 illustrates one embodiment of the present disclosure wherein a cleaning material **1302**, disposed on external surface **102'** of the extension member **101** represented by shaft **102**, is defined by a blade-like structure that includes, for example, first, second, third and fourth blade-like projections **1302a**, **1302b**, **1302c** and **1302d** that radially project outwardly from the shaft centerline axis **A-A**. The

blade-like structure **1302** may be formed from a flexible material such as cloth, rubber or silicone.

[0052] In a similar manner, although the blade like projections **1302a** to **1302d** may be moved in the X and/or Y directions described above with respect to FIG. 3, the blade-like projections **1302a** to **1302d** are also particularly suitable for rotational motion in the Z direction as described above with respect to FIG. 3. Thus, the blade-like structure of cleaning material **1302** is configured to clean at least a portion of the second surgical instrument **200** when the distance D1 between the first surgical instrument **100** and the second surgical instrument **200** is reduced sufficiently as described above.

[0053] FIG. 6 illustrates one embodiment of the present disclosure wherein a cleaning material **1303** is disposed on the extension member **101**, as represented by at least one of the jaw members **110** and **120** of the first surgical instrument **100**. More particularly, upper jaw member **120** is illustrated as having cleaning material **1303** disposed on upper surface **120'** of the jaw member **120** by means such as an adhesive layer **1321** adhering upper surface **120'** to interior surface **1303'** of the cleaning material **1303**. Again, the cleaning material **1303** may be made from a flexible material such as cloth, rubber or silicone or other suitable material.

[0054] The cleaning material **1303** on the jaw member **120** (or on jaw member **110**) may be moved in the X and/or Y and/or Z directions described above with respect to FIG. 3. Thus, in a similar manner, the cleaning material **1303** is configured to clean at least a portion of the second surgical instrument **200** when the distance D1 between the first surgical instrument **100** and the second surgical instrument **200** is reduced sufficiently as described above.

[0055] Those skilled in the art will recognize upon reading the foregoing disclosure that FIGS. 1, 1A and 2-6 illustrate a method of cleaning at least a portion of at least second surgical instrument **200** when in proximity to first surgical instrument **100**.

[0056] The method includes disposing a cleaning material on external surface **102'** of extension member **101**, e.g., cleaning material **1303** on external surface **120'** of jaw member **120** of first surgical instrument **100**, as illustrated in FIG. 6, or on an external surface of a shaft of the first surgical instrument, e.g., cleaning material **130** or **1301** or **1302** disposed on external surface **102'** of shaft **102** of the first surgical instrument **100** as illustrated in FIGS. 1, 1A and 2-5. The method also includes positioning the first surgical instrument **100** in proximity to second surgical instrument **200** to define distance D1 therebetween, as illustrated in FIG. 2.

[0057] As illustrated in FIG. 3, the method also includes reducing the distance D1 between the first surgical instrument **100** and the second surgical instrument **200**, such as by moving first surgical instrument **100** closer to second surgical instrument **200**, or by moving second surgical instrument **200** closer to first surgical instrument **100**, or by moving both surgical instruments **100** and **200** at the same time towards each other such that the cleaning material **130** contacts the second surgical instrument **200**.

[0058] As also illustrated in FIG. 3, the method also includes cleaning at least a portion of the second surgical instrument **200** with the cleaning material **130** when the distance D1 between the first surgical instrument **100** and the second surgical instrument **200** is reduced as described above.

[0059] As illustrated in FIGS. 1, 1A, and 2-5, the step of disposing the cleaning material may include disposing the cleaning material, e.g., cleaning materials **130**, **1301** and **1302**, on external surface **102'** at the distal end **102a** of the shaft **102** in proximity to the pair of jaw members **110** and **120**.

[0060] As illustrated in FIG. 6, the step of disposing the cleaning material may include disposing the cleaning material **1303** on at least one jaw member, e.g., on surface **120'** of jaw member **120**, as described above.

[0061] As illustrated in FIG. 1A, disposing the cleaning material may include, for example, adhering the cleaning material **130** to the shaft **102** via adhesive **132** adhering surface **130'** of the cleaning material **130** to external surface **102'** of the shaft **102**. As illustrated in FIG. 6, disposing the cleaning material may also include adhering the cleaning material **1303** disposed on external or upper surface **120'** of the jaw member **120** by means such as adhesive layer **1321** adhering upper surface **120'** to interior surface **1303'** of the cleaning material **1303**.

[0062] As illustrated in FIG. 4, the external surface **102'** of shaft **102** may define a depression **108** therein and the step of disposing the cleaning material may include disposing the cleaning material **1301** in the depression **108** in the shaft **102**.

[0063] As illustrated in FIG. 5, the step of disposing the cleaning material may include disposing cleaning material **1302** having a blade-like structure, and the step of cleaning at least a portion of the second surgical instrument **200** when the distance D1 is reduced may include cleaning at least a portion of the second surgical instrument **200** with the cleaning material **1302** having a blade-like structure, including cleaning at least a portion of the lens **214** of the laparoscopic instrument **200** with the cleaning material **1302** having a blade-like structure.

[0064] The step of cleaning may include cleaning at least a portion of the lens **214** of the laparoscopic instrument **200** when the distance D1 between the first surgical instrument **100** and laparoscopic instrument **200** is reduced sufficiently as described above.

[0065] As particularly illustrated in FIG. 3, the step of cleaning may include reciprocally moving the first surgical instrument **100** in the direction of the longitudinal axis A-A, as illustrated by arrow X-X, or in a zig-zag manner generally in the direction of the longitudinal axis A-A (not explicitly shown), such that the cleaning material, e.g. cleaning material **130**, **1301**, **1302** or **1302**, cleans the second surgical instrument **200** when the distance D1 is reduced sufficiently as described above.

[0066] The step of cleaning may also include moving the cleaning material in curved path Y to clean the second surgical instrument **200** when the distance D1 is reduced sufficiently.

[0067] The step of cleaning may also include rotating the cleaning material, e.g. cleaning material **130**, **1301**, **1302** or **1302**, around the longitudinal axis A-A such that the cleaning material cleans the second surgical instrument **200** when the distance D1 is reduced sufficiently.

[0068] While several embodiments of the disclosure have been shown in the drawings, it is not intended that the disclosure be limited thereto, as it is intended that the disclosures be as broad in scope as the art will allow and that the specification be read likewise. Therefore, the above description should not be construed as limiting, but merely as exemplifications of particular embodiments.

What is claimed is:

1. A first surgical instrument, comprising:

a handle assembly defining a proximal end of the first surgical instrument; and

an extension member extending distally from the handle assembly and defining a distal end of the first surgical instrument,

the extension member defining an external surface,

the handle assembly configured to enable a user to move the extension member,

wherein the improvement comprises:

a cleaning material disposed on the external surface of the extension member at the distal end thereof, the cleaning material configured to clean at least a portion of a second surgical instrument in proximity to the first surgical instrument, the first surgical instrument and the second surgical instrument defining a distance therebetween, the cleaning material configured to clean at least a portion of the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

2. The first surgical instrument according to claim 1, wherein the extension member is a shaft having a pair of jaw members at a distal end thereof, the jaw members movable about a pivot from a first position wherein the jaw members are disposed in spaced relation relative to one another to a at least a second position wherein the jaw members are closer to one another for grasping tissue, the shaft and the jaw members each defining external surfaces; and

the cleaning material is disposed on the external surface of at least one jaw member or disposed on the external surface of the shaft.

3. The first surgical instrument according to claim 2, wherein the cleaning material is disposed on the distal end of the shaft in proximity to the pair of jaw members.

4. The first surgical instrument according to claim 1, wherein the second surgical instrument is a laparoscopic instrument including a lens surface, and the cleaning material is configured to clean at least a portion of the lens of the laparoscopic instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

5. The first surgical instrument according to claim 1, wherein the cleaning material is adhered to the extension member via an adhesive adhering a surface of the cleaning material to the external surface of the extension member.

6. The first surgical instrument according to claim 2, wherein the cleaning material is adhered to the at least one jaw member or to the shaft via an adhesive adhering a surface of the cleaning material to the external surface of the at least one jaw member or to the external surface of the shaft respectively.

7. The first surgical instrument according to claim 1, wherein the extension member defines a depression therein and wherein the cleaning material is disposed in the depression in the extension member.

8. The first surgical instrument according to claim 1, wherein the cleaning material includes a blade-like structure, the blade-like structure configured to clean at least a portion of the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

9. The first surgical instrument according to claim 8, wherein the blade-like structure is formed from a flexible material.

10. The first surgical instrument according to claim 9, wherein the flexible material is made from one of cloth, plastic, rubber or silicone.

11. The first surgical instrument according to claim 8, wherein the second surgical instrument is a laparoscopic instrument including a lens surface, the blade-like structure configured to clean at least a portion of the lens of the laparoscopic instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

12. The first surgical instrument according to claim 1, wherein the cleaning material is made from one of cloth, plastic, rubber or silicone.

13. The first surgical instrument according to claim 1, wherein the extension member defines a longitudinal axis and the first surgical instrument is configured to reciprocally move in the direction of the longitudinal axis to enable the cleaning material to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

14. The first surgical instrument according to claim 1, wherein the first surgical instrument is configured to enable the cleaning material to move in a curved path to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

15. The first surgical instrument according to claim 1, wherein the extension member defines a longitudinal axis and the first surgical instrument is configured to rotate the cleaning material around the longitudinal axis to enable the cleaning material to clean the second surgical instrument when the distance between the first surgical instrument and the second surgical instrument is reduced.

16. A method of cleaning at least a portion of a second surgical instrument in proximity to a first surgical instrument, the first surgical instrument comprising a handle assembly and an extension member extending distally from the handle assembly, the method comprising:

disposing a cleaning material on an external surface of the extension member;

positioning the first surgical instrument in proximity to a second surgical instrument to define a distance therebetween;

reducing the distance between the first surgical instrument and the second surgical instrument; and

cleaning at least a portion of the second surgical instrument with the cleaning material when the distance between the first surgical instrument and the second surgical instrument is reduced.

17. The method of cleaning according to claim 16,

wherein the extension member is a shaft having a pair of jaw members at a distal end thereof, the jaw members movable about a pivot from a first position wherein the jaw members are disposed in spaced relation relative to one another to a at least a second position wherein the jaw members are closer to one another for grasping tissue and

wherein the step of disposing the cleaning material includes disposing the cleaning material on an external surface of the shaft or on an external surface of at least one jaw member.

18. The method of cleaning according to claim **17**, wherein the step of disposing the cleaning material includes disposing the cleaning material on the external surface of the shaft at the distal end of the shaft in proximity to the pair of jaw members.

19. The method of cleaning according to claim **16**, wherein the second surgical instrument is a laparoscopic instrument including a lens surface, the method comprising cleaning at least a portion of the lens of the laparoscopic instrument with the cleaning material when the distance between the first surgical instrument and the second surgical instrument is reduced.

20. The method of cleaning according to claim **16**, wherein the step of disposing the cleaning material includes adhering the cleaning material to the external surface of the extension member via an adhesive adhering a surface of the cleaning material to the external surface of the extension member.

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专利名称(译)	腹腔镜镜片擦拭功能在手术装置轴或钳口构件上		
公开(公告)号	US20140094650A1	公开(公告)日	2014-04-03
申请号	US14/023500	申请日	2013-09-11
[标]申请(专利权)人(译)	柯惠有限合伙公司		
申请(专利权)人(译)	COVIDIEN LP		
当前申请(专利权)人(译)	COVIDIEN LP		
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发明人	SCHANING, MATTHEW		
IPC分类号	A61B1/12 A61B17/28 A61B19/00		
CPC分类号	A61B2017/2901 A61B2017/3437 A61B2017/320004 A61B1/127 A61B1/313 A61B1/126 A61B2017/00353 A61B17/282 A61B19/34 A61B2017/2926 A61B17/29 A61B2019/343 A61B90/70 A61B2090/701		
优先权	61/708677 2012-10-02 US		
外部链接	Espacenet USPTO		

摘要(译)

第一手术器械包括具有延伸构件的轴，所述延伸构件例如在远端处的一对钳口构件，所述钳口构件可围绕用于抓取组织的枢轴移动。第一手术器械使使用者能够移动轴和一对钳夹构件。清洁材料设置在延伸构件的外表面上，例如至少一个钳口构件或设置在轴上。第一手术器械和第二手术器械限定彼此之间的距离。清洁材料被配置为当第一手术器械和第二手术器械之间的距离减小时，清洁第一手术器械附近的至少第二手术器械的至少一部分。还公开了用第一手术器械的清洁材料清洁第二手术器械的相应方法。

