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(54) Ultrasonic surgical instruments

(57) An ultrasonic surgical instrument (1) comprises an ultrasonic transducer (12) producing ultrasonic vibration, a transmission member (30) connected to the ultrasonic transducer (12) at a proximal end, and transmitting ultrasonic vibration produced by the ultrasonic transducer (12) from the proximal end to the distal end, a sheath (20) in which the transmission member (30) is inserted, a procedural unit (31, 33, 42) provided to the distal end of the transmission member (30) so that it projects from the distal end of the sheath (20), and treating a surgical target portion using ultrasonic vibration transmitted from the transmission member (30), a procedural unit main body (31b, 33b, 42b) provided in the procedural unit (31, 33, 42), and treating the surgical target portion, a procedural member (21, 44) provided in the sheath (20) so that it projects from the distal end of the sheath (20) to treat the surgical target portion, and a procedural member main body (21a, 4.9a) provided at the distal end of the procedural member (21, 44) to treat the surgical target portion. In the ultrasonic surgical instrument (1), the procedural member main body (21a, 44a) overlaps with the procedural unit main body (31b, 33b, 42b), and thereby, the procedural unit main body (31b, 33b, 42b) treat the surgical target portion.



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Description

[0001] The present invention relates to an ultrasonic surgical instrument used for orthopedics for treating bones.

[0002] In general, instruments are used when hard tissues such as bones and cartilage are cut off or cut in an orthopedic operation. For example, the foregoing instruments are a cold knife, manual punch forceps, a shaver driven by an electric motor and a drill.

[0003] For example, U.S. Patent No. 6,497,715 discloses an ultrasonic hand piece and an ultrasonic horn used therefore. The ultrasonic horn is one of members forming the ultrasonic hand piece. The ultrasonic horn has a work unit comprising at least one plane or more and an edge unit. The edge unit removes fine crushed bone tissues by the work unit. The foregoing ultrasonic hand piece and ultrasonic horn are used, and the following advantage is obtained. Specifically, in the ultrasonic hand piece used for cutting hard tissues, it is possible to prevent various disadvantages resulting from excessive cut of a knife unit to a cut portion. Further, it is possible to accurately control the knife unit in wide view so that hard tissues such as bones are precisely cut according to the surgical purpose.

[0004] In general, according to a procedure (cut-off or cut) carried out on hard tissues (surgical target portion) by the foregoing instrument, it is difficult to perform a delicate procedure. Namely, soft tissues around the hard tissue are cut; as a result, unexpected damage is given.

[0005] In order to solve the foregoing circumstance, an object of the present invention is to provide an ultrasonic surgical instrument, which can be easily and delicately treated the surgical target portion and perform a procedure without involving soft tissues and giving unexpected damage.

[0006] According to one aspect of the present invention, there is provided an ultrasonic surgical instrument comprising:

an ultrasonic transducer producing ultrasonic vibration;

a transmission member connected to the ultrasonic transducer at a proximal end, and transmitting ultrasonic vibration produced by the ultrasonic transducer from the proximal end to the distal end;

a sheath in which the transmission member is inserted;

a procedural unit provided to the distal end of the transmission member so that it projects from the distal end of the sheath, and treating a surgical target portion using ultrasonic vibration transmitted from the transmission member;

a procedural unit main body provided in the procedural unit, and treating the surgical target portion; a procedural member provided in the sheath so that it projects from the distal end of the sheath to treat the surgical target portion; and a procedural member main body provided at the distal end of the procedural member to treat the surgical target portion,

the procedural member main body overlapping with the procedural unit main body, and thereby, the procedural member main body and the procedural unit main body treating the surgical target portion.

[0007] The invention can be more fully understood
 from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a schematic view showing an ultrasonic surgical instrument used for orthopedics according to a first embodiment of the present invention;

FIG. 2 is a cross-sectional view showing the ultrasonic surgical instrument taken along line A-A shown in FIG. 1;

FIG. 3 is a cross-sectional view showing the ultrasonic surgical instrument taken along line B-B shown in FIG. 1;

FIG. 4 is a cross-sectional view showing the distal end of a shearing member and a procedural unit;

FIG. 5 is a perspective view showing the distal end of a shearing member and a procedural unit;

FIG. 6A is a view showing a procedural unit according to a modification example;

FIG. 6B is a view showing a procedural unit according to another modification example;

FIG. 7 is a perspective view showing a procedural unit according to a second embodiment of the present invention;

FIG. 8 is a perspective view showing the distal end of a shearing member and a procedural unit;

FIG. 9 is a schematic view showing an ultrasonic surgical instrument used for orthopedics according to a third embodiment of the present invention;

FIG. 10 is a traverse cross-sectional view showing a procedural unit and a cutting member;

FIG. 11 is a longitudinally cross-sectional view showing a procedural unit and a cutting member;

FIG. 12 is a perspective view showing a procedural unit;

FIG. 13 is a perspective view showing a state that a procedural unit and a cutting member is rotated with respect to the procedural unit; and

FIG. 14 is a view showing a procedural unit according to a modification example.

⁵⁰ **[0008]** Various embodiments of the present invention will be hereinafter described with reference to the accompanying drawings.

[0009] A first embodiment will be described below with reference to FIGS. 1 to 5.

⁵⁵ [0010] As shown in FIG. 1, an ultrasonic surgical instrument 1 used for orthopedics treats a surgical target portion in an orthopedic operation, for example. The surgical target portion is, for example, hard tissues such as bones and cartilage. The procedure means cut-off and cutting, for example.

[0011] The ultrasonic surgical instrument 1 has a cylindrical case 11 and a sheath 20. Specifically, the cylindrical case 11 is attached to a proximal side of the ultrasonic surgical instrument 1. The sheath 20 is attached to the distal side of the case 11.

[0012] The proximal side of the case 11 is connected with an output connection cable 2. The case 11 is connected with a power supply unit (not shown) via the output connection cable 2.

[0013] As illustrated in FIGS. 1 and 2, an ultrasonic transducer 12 is fixedly provided in the case 11. The ultrasonic transducer 12 has a piezoelectric element and a horn 12a. Specifically, the piezoelectric element produces ultrasonic vibration. The horn 12a is attached to the distal end of the ultrasonic transducer 12 in the longitudinal direction of the case 11, and amplifies ultrasonic vibration.

[0014] The ultrasonic transducer 12 is a member, which converts electrical energy to ultrasonic vibration. The energy is produced by the power supply unit (not shown), and then, supplied to the ultrasonic transducer 12 from the driver via the output connection cable 2, and thus, converted to ultrasonic vibration.

[0015] For example, the ultrasonic.transducer 12 is a bolt-clamped langevin type transducer (BLT).

[0016] The horn 12a is made of metallic materials such as titanium, duralumin and stainless.

[0018] The probe 30 is made of metallic materials such as titanium, duralumin and stainless.

[0019] The probe 30 further has a horn 30d on the proximal side of the probe 30. The horn 30d further amplifies ultrasonic vibration transmitted from the ultrasonic transducer 12 (horn 12a).

[0020] The distal end of the probe 30 is provided with a procedural unit 31, which projects from the distal end of the sheath 20. The procedural unit 31 treats a surgical target portion using ultrasonic vibration produced by the ultrasonic transducer 12 and transmitted from the probe 30. The procedural unit 31 has a flat shape approximately. The procedural unit 31 contacts with the surgical target portion, and thereby, treats it using ultrasonic vibration. **[0021]** The probe 30 further has a support member (rubber lining) 30e at an intermediate (antinode) position of the ultrasonic vibration. The support member 30e is used for fixing the probe 30 in the sheath 20. For example, the support member 30e is made of a resin such as silicon rubber.

⁵ **[0022]** The procedural unit 31 has a long-diameter loop shape in the longitudinal direction of the case 11 (in the longitudinal direction of the probe 30). The procedural unit 31 is formed with an opening 31a, which penetrates in the thickness direction of the procedural unit 31. The

¹⁰ distal end of the opening 31a in the longitudinal direction of the probe 30 is formed with a shearing edge 31b (see FIG. 4). The shearing edge 31b is sheared a surgical target portion together with an outer blade 21a described later. The shearing edge 31b is formed in a desired in-

¹⁵ clined state to shear a surgical target portion. The shearing edge 31b is formed in a desired inclined state to the longitudinal direction of the probe 30 at the distal end of the longitudinal direction of the probe 30 in the loop. In other words, the shearing edge 31b is formed in a desired

state of being inclined from one surface (e.g., upper surface 31c) of the procedural unit 31 to the other surface (e.g., lower surface 31d). The shearing edge 31b is a procedural unit main body for shearing a surgical target portion together with an outer blade 21a described later,
 that is, a shearing portion.

[0023] The sheath 20 is provided with a grip 13 for grasping the ultrasonic surgical instrument 1. The grip 13 has an elastic force. The grip 13 is a control unit, which slides a shearing member 21 to the probe 30 including
the procedural unit 31 along the longitudinal direction of

the probe 30.

[0024] As described above, the case 11 is provided with the sheath 20 in which the probe 30 is inserted, at the distal end of the case 11. In other words, the sheath 20 covers the probe 30.

[0025] As seen from FIGS. 1 to 3, the sheath 20 has an inner tube 20b covering the support member 30e, and an outer tube 20c covering the inner tube 20b.

[0026] The foregoing inner and outer tubes 20b and 20c are made of a metallic material such as stainless, for example.

[0027] As shown in FIG. 3, the outer tube 20c has a cylindrical shape while the inner tube 20b has a non-cylindrical shape. Thus, a space 20d is formed between

the outer and inner tubes 20c and 20b. The space 20d is formed along the longitudinal direction of the sheath 20. The space 20d is provided with a shearing member 21. The proximal end of the shearing member 21 is connected to the grip 13 as shown in FIG. 1. Moreover, the
distal end of the shearing member 21 projects from the distal end of the sheath 20 like the procedural unit 31 as shown in FIGS. 1 and 2, and has an outer metallic blade

21a. Namely, the shearing member 21 is provided in the sheath 20 so that it projects from the distal end of the
⁵⁵ sheath 20, and a shearing member for shearing a surgical target portion. In other words, the shearing member 21 is a procedural member for shearing the surgical target portion. The outer blade 21a is a procedural member

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main body for shearing the surgical target portion together with the shearing edge 31b.

[0028] The shearing member 21 is slidable along the longitudinal direction of the probe 30 with respect to the probe 30 including procedural unit 31 by operating the grip 13. The foregoing operation of the grip 13 means that a doctor (operator) grasps or releases the grip 13. Namely, the shearing member 21 has a slidable shape in the sheath 20 (between outer and inner tubes 20c and 20b, that is, in the space 20d). In this case, the shearing member 21 is slidable along the longitudinal direction of the sheath 20 with respect to the probe 30 including procedural unit 31 by operating the grip 13. Therefore, the shape of the shearing member 21 has no need of the same as that of the space 20d.

[0029] When the shearing member 21 slides along the longitudinal direction of the sheath 20 with respect to the probe 30 including procedural unit 31, the outer blade 21a slides on the procedural unit 31 (upper and lower surfaces 31c and 31d), as depicted in FIG. 5. In this way, the shearing member 21 moves to the shearing edge 31b. At that time, the outer blade 21a overlaps with the shearing edge 31, and thereby, the outer blade 21a and the shearing edge 31b shear a surgical target portion.

[0030] The operation according to this embodiment will be described below.

[0031] The procedural unit 31 contacts with a surgical target portion of a living tissue. In this state, electrical energy produced by the power supply unit (not shown) is supplied from the drive (not shown) to the ultrasonic transducer 12 via the output connection cable 2. Then, the foregoing energy is converted to ultrasonic vibration by the ultrasonic transducer 12. The ultrasonic vibration is amplified by the horn 12a, and transmitted to the probe 30. Then the ultrasonic vibration further is amplified by the horn 30d and then, transmitted from the probe 30 to the surgical target portion via the procedural unit 31. Namely, the ultrasonic vibration is transmitted from the proximal end of the probe 30 to the distal end thereof. In this way, the surgical target portion is treated by means of the procedural unit 31.

[0032] When a doctor (operator) grasps the grip 13, the shearing member 21 slides toward the distal end of the procedural unit 31 along the longitudinal direction of the probe 30. In this way, the outer blade 21a slides on the procedural unit 31 (upper and lower surfaces 31c and 31d), and thus, moves to the shearing edge 31b. In this case, the outer blade 21a overlaps with the shearing edge 31b, and thereby, the surgical target portion is sheared by the outer blade 21a and the ultrasonically vibrating shearing edge 31b.

[0033] Conversely, when a doctor releases the grip 13, the grip 13 is returned to the previous state that the doctor grasps the grip 13, by elastic force. In this way, the shearing member 21 slides toward the distal end of the sheath 20 along the longitudinal direction of the probe 30.

[0034] As described above, according to this embodiment, the surgical target portion is easily treated by the procedural unit 31 using ultrasonic vibration. In addition, according to this embodiment, the grip 13 is grasped so that the sharing member 21 is slidable. In this way, the surgical target portion is treated by the outer blade 21a

⁵ and the ultrasonically vibrating shearing edge 31b. According to this embodiment, the surgical target portion is easily and delicately treated. Therefore, this serves to treat the surgical target portion without giving damage to soft tissues (without involving soft tissues). As a result,

¹⁰ the surgical target portion is treated without giving unexpected damage.

[0035] According to this embodiment, the surgical target portion is placed in the opening 31a, and thereby, a procedure such as cutting is easily performed using ultrasonic vibration.

[0036] As seen from the foregoing description, this embodiment can provide two procedures, that is, cutting and shearing using ultrasonic vibration.

[0037] According to this embodiment, a sheared surface of the surgical target portion is made smooth by ultrasonic vibration of the shearing edge 31b. This serves to relieve pain of a patient after being operated.

[0038] According to this embodiment, the shearing member 21 is slid to treat a surgical target portion. There-²⁵ fore, a procedure is carried out without involving soft tissues, and without giving unexpected damage (i.e., it is possible to prevent damage of the surgical target por-

[0039] According to this embodiment, the grip 13 isgrasped, and thereby, the surgical target portion is

sheared. Therefore, the shearing operation is easy.

[0040] It should be noted that the shearing edge 31b has no need to be limited to the shape shown in FIG. 4.
[0041] For example, the shearing edge 31b may be formed obliquely from the upper surface 31c of the procedural unit 31 toward the longitudinal direction of the probe 30 and from the lower surface 31d thereof toward the same, as seen from FIG. 6A.

[0042] Moreover, as shown in FIG. 6B, the shearing
edge 31b may be formed vertically from the upper surface
31c of the procedural unit 31 to the lower surface 31d
with respect to the longitudinal direction of the probe 30.
[0043] A second embodiment of the present invention
will be described below with reference to FIGS. 7 and 8.

⁴⁵ The same numbers are used to designate portions having the same structure as the first embodiment and its modification example, and the explanation is omitted.

[0044] A procedural unit 33 of this second embodiment has no opening 31a. The procedural unit 33 is integrally
⁵⁰ formed with a projecting portion 33, which vertically projects with respect to the longitudinal direction of a probe 30. In other words, the procedural unit 33 including the projecting portion 33a has a hook shape. The projecting portion 33a has a shearing edge 33b (procedural unit main body), which is a shearing portion same as the shearing edge 31b, at the chip end of the vertically projecting portion 33a. Further, the projecting portion 33a has a desired height so that the shearing edge 33b over-

laps with an outer blade 21a in the vertical direction.

[0045] When the procedural unit 33 treats a surgical target portion, an ultrasonic surgical instrument 1 including the procedural unit 33 moves in a state that the procedural unit 33 projects from the distal end of a sheath 20. The projecting portion 33a contacts with the surgical target portion, and thereby, the procedural unit 33 treats the surgical target portion using ultrasonic vibration.

[0046] When a doctor (operator) grasps a grip 13, a shearing member 21 slides toward the projecting portion 33a along the longitudinal direction of the probe 30 as shown in FIG. 8. In this way, an outer blade 21a moves toward the shearing edge 33b. At that time, the outer blade 21a overlaps with the shearing edge 33b, and thereby, the surgical target portion is cut or treated by the outer blade 21a and the shearing edge 33b.

[0047] According to the second embodiment, the same effect as the first embodiment is obtained.

[0048] The procedural unit 33 of this embodiment has a hook shape. Therefore, according to this embodiment, the procedural unit 33 easily hooks the surgical target portion. This serves to simplify the operation until a procedure is carried out.

[0049] A third embodiment of the present invention will be described below with reference to FIGS. 9 and 13. The same numbers are used to designate portions having the same structure as the first embodiment and its modification example, and the explanation is omitted.

[0050] An ultrasonic surgical instrument 1 of this third embodiment has a cutting member 44. When a control unit 40 is rotated, the cutting member 44 is rotated with respect to a procedural unit 42 in accordance with the rotation of the control unit 40. The cutting member 44 is rotatable with respect to the procedural unit 42, and is a procedural member for cutting a surgical target portion. [0051] The procedural unit 42 has a flat shape, and contacts with a surgical target portion to treat it using ultrasonic vibration. The procedural unit 42 has a largediameter loop shape in the longitudinal direction of a case 11 (of the probe 30). The procedural unit 42 is formed with an opening 42a, which penetrates in the thickness direction of the procedural unit 42. The opening 42a has a cutting edge 42b at the outer peripheral portion. The cutting edge 42b is a cutting unit for cutting a surgical target portion together with a blade 44a described later. In other words, the cutting edge 42b is formed along the longitudinal direction in the loop. The cutting edge 42b is a procedural unit main body for cutting a surgical target portion together with a blade 44a described later.

[0052] A cutting member 44 is inserted in the opening 42a. The cutting member 44 rotates with respect to the procedural unit 42. Further, the cutting member 44 has a metallic blade 44a, which is formed to be fitted in the opening 42a. The blade 44a is a procedural member main body.

[0053] The cutting member 44 is rotatable with respect to the probe 30 including the procedural unit 42 by operating the control unit 40. The rotation mechanism for ro-

tating the cutting member 44 in accordance with the operation of the control unit 40 is omitted for simplification of the drawings. However, it is obvious for the skilled person to include a known rotation mechanism.

⁵ **[0054]** When the cutting member 44 is rotated, the blade 44a moves toward the cutting edge 42b. At that time, the blade 44a overlaps with the cutting edge 42b so that a surgical target portion is held between the blade 44a and the cutting edge 42b. In this way, the blade 44a

and the cutting edge 42b cut the surgical target portion.[0055] The operation of this third embodiment will be described below.

[0056] When a doctor (operator) grasps the control unit 40, the cutting member 44 is rotated toward the opening

¹⁵ 42a. In this way, the blade 44a moves toward the cutting edge 42b.

[0057] In this case, living tissues, that is, a surgical target portion is held between the procedural unit 42 and the cutting member 44. The cutting member 44 further

20 rotates toward the opening 42a from the foregoing state. Electrical energy produced by the power supply unit is converted to ultrasonic vibration as in the first embodiment. The ultrasonic vibration is amplified as in the first embodiment, and then, transmitted to the probe 30. In 25 this case, the ultrasonic vibration is transmitted to a sur-

5 this case, the ultrasonic vibration is transmitted to a surgical target portion via the procedural unit 42.

[0058] Then, the blade 44a overlaps with the cutting edge 42b so that a surgical target portion is held between the blade 44a and the cutting edge 42b. In this way, the blade 44a and the cutting edge 42b cut the surgical target

portion.[0059] According to this embodiment, the same effect as the first embodiment is obtained.

[0060] According to this embodiment, the cutting member 44 is rotated toward the opening 42a so that a surgical target portion is held between the blade 44a and the cutting edge 42b. Therefore, this serves to cut the surgical target portion only. In addition, according to this embodiment, the surgical target portion is treated in a state of
 ⁴⁰ being held between there. Therefore, a surgical target

portion having some thickness is easily cut.[0061] The procedural unit 42 of this embodiment is not limited to the foregoing shape. For example, as seen from FIG. 14, the procedural unit 42 has a U-letter shape

⁴⁵ when being viewed from the vertical direction in the longitudinal direction of the probe 30. The procedural unit 42 has a first cutting edge 46a, which is one of the facing U-letter sides, and a second cutting edge 46b, which is the other thereof. The foregoing first and second cutting

⁵⁰ edges 46a and 46b are a procedural unit main body. Namely, the first and second cutting edges 46a and 46b are provided at one side of the U-letter shape and the other side thereof, respectively. Further, the first and second cutting edges 46a and 46b are provided in parallel
⁵⁵ along the longitudinal direction of the probe 30. The cutting member 44 rotating to the procedural unit 42 is inserted in a space 48 formed between the first and second cutting edges 46a and 46b.

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[0062] The present invention is not limited to the foregoing embodiments. In the inventive stage, constituent elements may be modified and embodied without departing from the subject matter. A plurality of constituent elements disclosed in the foregoing embodiments are properly combined, and thereby, various inventions can be provided.

Claims

1. An ultrasonic surgical instrument (1) **characterized by** comprising:

an ultrasonic transducer (12) producing ultrasonic vibration;

a transmission member (30) connected to the ultrasonic transducer (12) at a proximal end, and transmitting ultrasonic vibration produced by the ultrasonic transducer (12) from the proximal end 20 to the distal end;

a sheath (20) in which the transmission member (30) is inserted;

a procedural unit (31, 33, 42) provided to the distal end of the transmission member (30) so that it projects from the distal end of the sheath (20), and treating a surgical target portion using ultrasonic vibration transmitted from the transmission member (30);

a procedural unit main body (31b, 33b, 42b) provided in the procedural unit (31, 33, 42), and treating the surgical target portion;

a procedural member (21, 44) provided in the sheath (20) so that it projects from the distal end of the sheath (20) to treat the surgical target portion; and

a procedural member main body (21a, 44a) provided at the distal end of the procedural member (21, 44) to treat the surgical target portion,

the procedural member main body (21a, 44a) overlapping with the procedural unit main body (31b, 33b, 42b), and thereby, the procedural member main body (21a, 44a) and the procedural unit main body (31b, 33b, 42b) treating the surgical target portion.

- 2. The instrument (1) according to claim 1, characterized in that the procedural member (21) is a shearing member, which slides along the longitudinal direction of the transmission member (30) with respect to the transmission member (30), and the procedural unit main body (31b, 33b) is a shearing portion, and further, the procedural member main body (21a) and the procedural unit main body (31b, 33b) shear the surgical target portion.
- **3.** The instrument (1) according to claim 2, **characterized in that** the procedural unit (31) has a large-

diameter loop shape in the longitudinal direction of the transmission member (30), and the procedural unit main body (31b) is formed in a state of being desired inclined to the longitudinal direction of the transmission member (30) at the distal end of the longitudinal direction of the transmission member (30) in a loop.

- 4. The instrument (1) according to claim 2, characterized in that the procedural unit (31) has a largediameter loop shape in the longitudinal direction of the transmission member (30), and the procedural unit main body (31b) is formed vertically to the longitudinal direction of the transmission member (30) at the distal end of the longitudinal direction of the transmission member (30) in a loop.
- 5. The instrument (1) according to claim 2, characterized in that the procedural unit (33) has a projecting portion (33a) formed vertically to projects with respect to the longitudinal direction of the transmission member (30), and the projecting portion (33a) has the procedural unit main body (33b) at the distal end of the projecting portion (33a) in the vertical direction.
- 6. The instrument (1) according to claim 1, **character**ized in that the procedural member (44) is rotatable with respect to the procedural unit (42).
- 7. The instrument (1) according to claim 6, characterized in that the procedural unit (42) has a largediameter loop shape in the longitudinal direction of the transmission member (30), and the procedural unit main body (42b) is a cutting unit formed along the longitudinal direction of the transmission member (30) in a loop,

the procedural member (44) is a cutting member, the procedural member (44) is rotated toward the procedural unit (42) so that the procedural member main body (44a) and the procedural unit main body (42b) overlaps, and the surgical target portion is held between the procedural member main body (44a) and the procedural unit main body (42b), and thereby, the procedural member main body (44a) and the procedural unit main body (42b) cut the surgical target portion.

8. The instrument (1) according to claim 6, characterized in that the procedural unit (42) has a U-letter shape when being viewed from the vertical direction in the longitudinal direction of the transmission member (30), and

the procedural unit main bodies (46a, 46b) are provided as one side of the facing U-letter shape and the other side thereof, respectively.

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F1G.2









F I G. 5



FIG.6A

F I G. 6B



FIG. 7





F I G. 9









FIG. 12





FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

• US 6497715 B [0003]

patsnap

专利名称(译)	超声波手术器械		
公开(公告)号	EP2135570A2	公开(公告)日	2009-12-23
申请号	EP2009005173	申请日	2009-04-08
[标]申请(专利权)人(译)	奥林巴斯医疗株式会社		
申请(专利权)人(译)	奥林巴斯医疗系统公司		
当前申请(专利权)人(译)	奥林巴斯医疗系统公司		
[标]发明人	YOSHIMINE HIDETO KIMURA KENICHI KOMAGATA SUSUMU ISHIKAWA MANABU		
发明人	YOSHIMINE, HIDETO KIMURA, KENICHI KOMAGATA, SUSUMU ISHIKAWA, MANABU		
IPC分类号	A61B17/32 A61B17/3205 A61B17/	3207	
CPC分类号	A61B17/320068 A61B17/320016 A	A61B17/32056 A61B17/3207 A61B	2017/320089 A61B2017/320093
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其他公开文献	EP2135570B1 EP2135570A3		
外部链接	Espacenet		

摘要(译)

超声波手术器械(1)包括产生超声波振动的超声波换能器(12),在近 端连接到超声波换能器(12)的传输构件(30),以及由超声波换能器 (12)产生的超声波振动器远端的近端,插入传动构件(30)的护套 (20),设置在传动构件(30)的远端的程序单元(31,33,42),使其 突出从护套(20)的远端开始,并利用从传动构件(30)传递的超声波 振动来处理手术目标部分,手术单元主体(31b,33b,42b)设置在手 术单元(31,33,42)中,并且处理手术目标部分,设置在护套(20)中 的程序构件(21,44)使得其从护套的远端突出(20)治疗手术目标部 分,以及设置在手术构件(21,44)远端的手术构件主体(21a,4.9 a),以治疗手术目标部分。在超声波手术器械(1)中,手术构件主体 (21a,44a)与手术单元主体(31b,33b,42b)重叠,从而,手术构 件主体(21a,44a)与手术构件主体(21a,44a)重叠单元主体 (31b,33b,42b)处理手术目标部分。



FIG.5