



(51) International Patent Classification:

A61B 17/12 (2006.01) A61F 5/00 (2006.01)
A61F 2/00 (2006.01)

(21) International Application Number:

PCT/SE2010/051177

(22) International Filing Date:

29 October 2010 (29.10.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

0901391-3 29 October 2009 (29.10.2009) SE
61/255,991 29 October 2009 (29.10.2009) US

(71) Applicant (for all designated States except US): **MILUX HOLDING S.A.** [—/LU]; 12, Rue Guillaume Schneider, L-2522 Luxemburg (LU).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **FORSELL, Peter** [SE/CH]; Aegeristrasse 66, CH-6300 Zug (CH).

(74) Agent: **BERGENSTRÄHLE & LINDVALL AB**; Box 17704, S-118 93 Stockholm (SE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

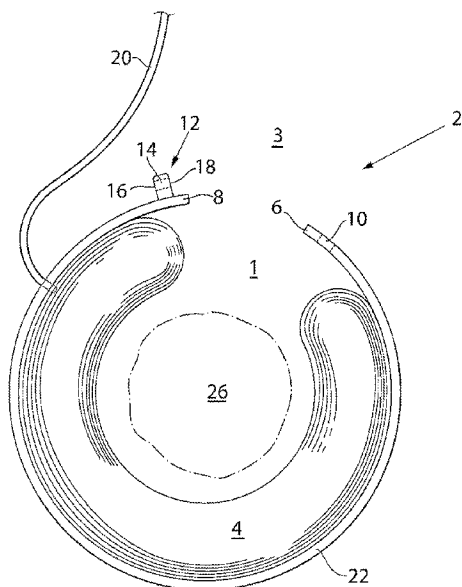
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(54) Title: FASTENING DEVICE, IMPLANT DEVICE, LOCKING METHOD, AND OPERATION METHOD

Fig. 1



(57) Abstract: The invention relates to a fastening device for implant device, the fastening device comprising at least two fastening sections, where a first fastening section is arranged with a through hole, a second fastening section is arranged with a protruding part, and where said protruding part is in place in said through hole in a fastening device locking state, where the protruding part on the second fastening section is arranged with a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state, wherein the first fastening section is securely locked to the second fastening section when, in said fastening device locking state, said implant device feed member is in place in the trough channel and protrudes from both the inlet and the outlet of said trough channel. The invention further relates to an implant device comprising a fastening device, and a method for securely locking a first fastening section of a fastening device for an implant device to a second section of a fastening device for an implant device.

FASTENING DEVICE, IMPLANT DEVICE, LOCKING METHOD, AND OPERATION METHOD

TECHNICAL FIELD OF THE INVENTION

5

The present invention generally relates to a fastening device for an implant device and more specifically to a fastening device for an adjustable implant device connected to an implant device feed member. The present invention also relates to methods for locking and implanting a medical implant.

10

TECHNICAL BACKGROUND

Implant devices are devices that are adapted for being placed in e.g. human bodies or animals, and that e.g. replace body parts that have been damaged or removed e.g. due to cancer.

15

In order to keep the implant device in place so that it does not move freely within e.g. a human body cavity, it is known to fasten the implant device in position using a fastening device. A known fastening device is a band type device having two ends, where a first end has a hole, and a second end has a protruding part arranged to be placed in said hole in order to lock the two ends of the band type device together after having been looped around an implant device and a body part such as an intestine, thereby fastening the implant device in place. In order for the band ends not to be separated when e.g. a person carrying the implant moves around, the protruding part is of flexible material and has a ball shaped outer end of somewhat larger cross-section than the diameter of the hole, whereby the ball shaped end is elastically deformed when pushed through the hole and regains its shape when leaving the hole, thus keeping the band ends locked to each other.

20

25

SUMMARY OF THE INVENTION

30

The problem of keeping an implant in place so that it does not move freely is solved according to the invention: by a fastening device for an implant device as stated in claim 1, by an implant device comprising a fastening device as stated in claim 48, by a method for securely locking a first fastening section of a fastening device for an implant device to a

second section of a fastening device for an implant device, as stated in claim 49, and by an operation method as stated in the characterizing portion of claim 50 and 51.

5 By providing a protruding part on the second fastening section arranged with a trough channel having an inlet and an outlet, said through channel being arranged to receive the implant device feed member, wherein the implant device feed member is arranged to be a locking member and for being involved in the adjustment of the implant device by feeding at least one of a hydraulic or pneumatic fluid, electrical energy and an electrical signal to the implant device, wherein said inlet and outlet is accessible from the exterior of the fastening device in
10 said fastening device locking state, wherein the first fastening section is detachably and securely locked to the second fastening section when, in said fastening device locking state, said implant device feed member is in place in the trough channel and protrudes from both the inlet and the outlet of said trough channel, wherein said fastening device is adapted to be reversible in two steps, involving to remove said implant device feed member from the
15 through channel and thereafter detaching the first fastening section from the second fastening section, the above mentioned problems are avoided or at least mitigated.

Further preferred exemplary embodiments are defined in the dependent claims.

20 In one embodiment, the first fastening section has e.g. a cylindrical, tubular or band shaped cross-section.

In one embodiment, the first fastening section has a tubular cross-section, and that the trough hole is arranged at least through one wall of the tubular first fastening section.

25 In one embodiment, the second fastening section has e.g. a cylindrical, tubular or band shaped cross-section.

In one embodiment, the first and the second fastening sections are arranged on the same
30 fastening unit.

In one embodiment, the fastening unit is attached to the implant device.

In one embodiment, the implant device feed member is attached to the fastening unit.

In one embodiment, the first and the second fastening sections are arranged on separate fastening units.

5

In one embodiment, the at least one of the fastening units is attached to the implant device.

In one embodiment, the implant device feed member is attached to a fastening unit.

10 In one embodiment, the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on the same side of the first fastening section in the fastening device locking state.

15 In one embodiment, the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on different sides of the first fastening section in the fastening device locking state.

20 In one embodiment, the outlet of the trough channel arranged in the protruding part on the second fastening section is arranged to connect to an inlet of a trough hole arranged in the second fastening section, wherein the inlet of the trough channel arranged in the protruding part on the second fastening section and the outlet of the trough hole in the second fastening section are arranged on different sides of the first fastening section in the fastening device locking state.

25 In one embodiment, the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on opposite sides of the first fastening section in the fastening device locking state.

30 In one embodiment, the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged adjacent the surface of the first fastening section in the fastening device locking state.

In one embodiment, the protruding part arranged on the second fastening section is arranged to protrude substantially axially from one end of the second fastening section.

5 In one embodiment, the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on different sides of the second fastening section.

10 In one embodiment, the protruding part arranged on the second fastening section is arranged to protrude substantially perpendicular to the longitudinal axis of the second fastening section, and from one end of the second fastening section.

In one embodiment, the protruding part arranged on the second fastening section is arranged to protrude substantially perpendicular to the longitudinal axis of the second fastening section.

15 In one embodiment, the protruding part arranged on the second fastening section is arranged adjacent to one end of the second fastening section.

20 In one embodiment, the trough hole arranged in the first fastening section is arranged at an angle to the longitudinal axis of the first fastening section.

In one embodiment, the protruding part arranged on the second fastening section is arranged at an angle to the longitudinal axis of the second fastening section.

25 In one embodiment, the trough hole arranged in the first fastening section is arranged substantially perpendicular to the longitudinal axis of the first fastening section.

30 In one embodiment, the implant device feed member is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals between the implant device and a remote unit.

In one embodiment, the implant device feed member is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals to the implant device.

In one embodiment, the implant device feed member is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals from the implant device.

- 5 In one embodiment, the first fastening section is detachably securely locked to the second fastening section when said implant device feed member is in place in the trough channel and protrudes from both the inlet and the outlet of said trough channel.

In one embodiment, the implant device feed member is attached to the implant device.

- 10 In one embodiment, the implant device feed member is detachably attached to the implant device.

In one embodiment, the protruding part is an integrated part of the second fastening section.

- 15 In one embodiment, the implant device is arranged to be fastened around a body part or another implanted device or member.

In one embodiment, the first fastening section is arranged with more than one trough hole in order to be able to lock the fastening device in more than one fastening device locking state.

20

In one embodiment, the first fastening section is arranged with more than one trough hole, and in that the second fastening section is arranged with more than one protruding part in order to be able to lock the fastening device in more than one fastening device locking state, i.e. the fastening device is adapted to create two or more locking positions, said fastening device comprising two or more protruding parts and two or more through going holes wherein a first through going hole is placed more distal to the second or more through going hole to include anyone of the protruding parts inside said first through going hole, thus creating two or more locking positions.

25

- 30 In one embodiment, the implant device is arranged to be fastened around at least one of a stomach or divided part of the stomach, an intestine, a closing sphincter and other part of the food passageway.

In one embodiment, the implant device is arranged to be fastened around at least one of an urethra and other part of the urinary tract.

5 In one embodiment, the implant device is arranged to be fastened around a blood vessel or heart.

In one embodiment, the implant device is arranged to be fastened around a vas deferens or uterine tube.

10 In one embodiment, the implantable implant device comprises a restriction device and wherein the fastening device is adapted to create a closed loop by fastening said restriction device.

15 In one embodiment, the implant device comprising at least two implant device parts placed remote from each other, and wherein said implant device feed member is adapted to be connected to at least said two parts, when said implant is implanted in a mammal body.

In one embodiment, at least one of said implant device parts comprises an internal energy source.

20 In one embodiment, at least one of said implant device parts comprises an internal wireless energy receiver adapted to receive wireless energy for supplying energy to any of the energy consuming parts of said implant device.

In one embodiment, at least one of said implant device parts comprises a pump.

25

In one embodiment, at least one of said implant device parts comprises a motor.

30 In one embodiment, said implant device is an adjustable hydraulically implant device, comprising a restriction device, and a pump for moving hydraulic fluid to and from said restriction device, wherein said fastening device is adapted to fasten said first and second fastening sections included in said restriction device into a closed loop and wherein said restriction device and said pump is hydraulically connected by a hydraulic tube, wherein said tube comprising the implant feed member.

In one embodiment, the implant feed device member is arranged to be in contact with said first fastening section, when locked in said locking state.

- 5 In one embodiment, said first and second fastening members are in contact with each other when locked in said locking state.

The invention also relates to a fastening device, wherein said implant device is an adjustable electrically powered implant device, comprising a restriction device, and a power supply for
10 powering an adjustment of said restriction device, wherein said fastening device is adapted to fasten said first and second fastening sections included in said restriction device into a closed loop and wherein said restriction device and said power supply is electrically connected by a electric cable, wherein said cable comprising the implant feed member

- 15 In one embodiment, the invention further relates to a method for securely locking a first fastening section of a fastening device for an implant device to a second fastening section of a fastening device for an implant device, the fastening device comprising at least two fastening sections, where the first fastening section is arranged with a through hole and the second fastening section is arranged with a protruding part, and where a fastening device locking
20 state is defined by said protruding part being placed in place in said trough hole, where the method comprises the steps of:

- arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said
25 fastening device locking state,
- placing said implant device feed member in the trough channel, and
- securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel.

30

In one embodiment, the invention also relates to an operation method for implanting a medical implant comprising a fastening device according to claim 1, the method comprising the steps of

- inserting a needle or tube-like instrument into a cavity of a mammal patient;
inflating said cavity by introducing a fluid through said needle or tube-like instrument and
thereby expanding said cavity;
placing at least two laparoscopic trocars in said cavity;
- 5 inserting a camera through one of said laparoscopic trocars into said cavity;
inserting at least one dissecting tool through one of said at least two laparoscopic trocars;
dissecting an area of the body;
placing the implant with the fastening device in the dissected area;
locking a first fastening section of a fastening device for the implant device to a second
- 10 fastening section of the fastening device, the fastening device comprising at least two
fastening sections, where the first fastening section is arranged with a through hole and the
second fastening section is arranged with a protruding part, and where a fastening device
locking state is defined by said protruding part being placed in place in said trough hole,
arranging, on the protruding part on the second fastening section, a trough channel having an
- 15 inlet and an outlet, said through channel being arranged to receive an implant device feed
member, said inlet and outlet being accessible from the exterior of the fastening device in said
fastening device locking state,
placing said implant device feed member in the trough channel, and
securely locking the first fastening section to the second fastening section by arranging, in
- 20 said fastening device locking state, said implant device feed member to protrude from both
the inlet and the outlet of said trough channel,

- In one embodiment, the invention also relates to an for implanting a medical implant
comprising a fastening device according to claim 1, the method comprising the steps of
- 25 cutting the skin of a human patient;
dissecting an area of body;
placing the implant in the dissected area;
locking a first fastening section of a fastening device for the implant device to a second
fastening section of the fastening device, the fastening device comprising at least two
- 30 fastening sections, where the first fastening section is arranged with a through hole and the
second fastening section is arranged with a protruding part, and where a fastening device
locking state is defined by said protruding part being placed in place in said trough hole,

arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state,

- 5 placing said implant device feed member in the trough channel, and
securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel.

- 10 In one embodiment, the invention also relates to a method of treating a mammal patient according to any one of above described operation methods, further comprising the step of withdrawing the instruments.

- In one embodiment, the invention also relates to a method of treating a mammal patient
15 according to any one of above described operation methods, further comprising the step of closing the skin using sutures or staples.

- In one embodiment, the invention also relates to a method of treating a mammal patient according to any one of above described operation methods, wherein the step of dissecting
20 includes dissecting an area of the abdomen or thorax or retroperitoneal space or pelvic region, comprising, dissecting an area of at least one of the following organs esophagus, stomach, intestine, colon, rectum, anus, anal sphincter, cardia sphincter, pylori sphincter, urethra, ureter, urine bladder, vas deferens, uterine tube, blood vessel, and heart.

- 25 In one embodiment, the invention also relates to a method of treating a mammal patient according to any one of above described operation methods, wherein the implantable device comprise a restriction device and the fastening device is adapted to create a closed loop by fastening said restriction device, wherein the method comprising the step of fastening said fastening device creating a closed loop.

- 30 In further embodiments, the invention also relates to an implant device comprising a fastening device as described in any of the above embodiments above, or possible combinations thereof.

Please note that all the embodiments or features of an embodiment as well as any method or step of a method could be combined in any way if such combination is not clearly contradictory. Please also note that the description in general should be seen as describing both an apparatus or device adapted to perform a method as well as this method in itself.

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 shows schematically a fastening device for an implant device according to one exemplary embodiment of the invention,

Fig. 2 shows schematically fastening sections of a fastening device according to one exemplary embodiment of the invention,

Fig. 3 shows schematically fastening sections of a fastening device according to another exemplary embodiment of the invention,

Fig. 4 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

Fig. 5 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention.

Fig. 6 shows schematically a fastening device for an implant device according to another exemplary embodiment of the invention,

Fig. 7 shows schematically a fastening device for an implant device according to a yet another exemplary embodiment of the invention,

Fig. 8 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

Fig. 9 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

5 Fig. 10 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

Fig. 11 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

10 Fig. 12 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

Fig. 13 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

15

Fig. 14 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention,

20 Fig. 15 shows schematically an implant device according to yet another exemplary embodiment of the invention, and

Fig. 16 shows schematically an implant device according to yet another exemplary embodiment of the invention.

25 DESCRIPTION OF PREFERRED EMBODIMENTS

Briefly described, the present invention provides a solution for enabling an easy and fully, i.e. 100%, reversible way of keeping an implant in place so that it does not move freely, by providing and placing a fastening device for an implant device into e.g. a body of a patient, 30 where the “patient” is a living creature such as e.g. a human or an animal.

The invention is now described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows schematically a fastening device 2 for an implant device 4 according to one exemplary embodiment of the invention. The implant device is adjustable and the fastening device 2 comprises at least two fastening sections 6, 8 (only two fastening sections are shown in the figure), where a first fastening section 6 is arranged with a through hole 10, a second fastening section 8 is arranged with a protruding part 12, and where said protruding part 12 is in place in said through hole 10 in a fastening device locking state (for the fastening device locking state, see figure 2, figure 1 shows an unlocked fastening device state). As can be seen from the figure 1, the protruding part 12 on the second fastening section 8 is arranged with a trough channel 14 having an inlet 16 and an outlet 18, said through channel 14 being arranged to receive an implant device feed member 20. The implant device feed member is arranged to be a locking member and for being involved in the adjustment of the implant device by feeding at least one of a hydraulic or pneumatic fluid, electrical energy and an electrical signal to the implant device. Also, the first and second fastening members are in contact with each other when locked in the locking state. The inlet 16 and the outlet 18 are accessible from the exterior 1, 3 of the fastening device 2 in said fastening device locking state, wherein the first fastening section 6 is detachably securely locked to the second fastening section 8 when, in said fastening device locking state, said implant device feed member 20 is in place in the trough channel 14 and protrudes from both the inlet 16 and the outlet 18 of said trough channel 14. The fastening device is adapted to be reversible in two steps, involving to remove said implant device feed member from the through channel and thereafter detaching the first fastening section from the second fastening section.

It is preferred that the implant feed device member 20 is arranged to be in contact with the first fastening section, when locked in said locking state.

Said trough channel 14 may be of any length, i.e. if the protruding part 12 is very thin, said trough channel 14 could be similar to a hole.

Said inlet 16 and outlet 18 are accessible from the exterior of the fastening device 2 in said fastening device locking state, i.e. said inlet 16 and/or outlet 18 may be accessible from one or more sides of the fastening device 2 in said fastening device locking state, e.g. from one of or from some of the following sides: the outer side, the inner side, or any other side not belonging to the outer side and the inner side, of the fastening device 2, see e.g. figure 8

showing an embodiment where said inlet 16 is accessible from the exterior of the fastening device 2 by being accessible from the inner side 1 of the fastening device 2 and where said outlet 18 is accessible from the exterior of the fastening device 2 by being accessible from the outer side 3 of the fastening device 2.

5

The first fastening section 6 of the fastening device 2, and the second fastening section 8 of the fastening device 2, may have any cross-section, e.g. a cylindrical, tubular or band shaped cross-section, where a band shaped cross-section is shown in the figure for both the first fastening section 6 and the second fastening section 8, and where the cross-section of the first fastening section 6 does not have to be the same as the cross-section of the second fastening section 8.

10

The first and the second fastening sections 6, 8 may be arranged on the same fastening unit or on separate fastening units, where an embodiment where the first and the second fastening sections 6, 8 are arranged on the same fastening unit 22, is shown in the figure.

15

None or at least one of the fastening units may be attached to the implant device 4, and the implant device feed member 20 may be or not be attached to a fastening unit, where an embodiment where no fastening unit 22 is attached to the implant device 4 by attachment means, e.g. by chemical or mechanical means such as adhesive or suturing, and where the implant device feed member 20 is not attached to a fastening unit 22, is shown in the figure.

20

The inlet 16 and the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 may be arranged on the same side of the first fastening section 6 in the fastening device locking state, or on different sides of the first fastening section 6 in the fastening device locking state, where an embodiment where the inlet 16 and the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 is arranged on the same side of the first fastening section 6 in the fastening device locking state, is shown in the figure.

25

30

It could also be possible to arrange the outlet of the trough channel arranged in the protruding part on the second fastening section to connect to an inlet of a trough hole arranged in the second fastening section, wherein the inlet of the trough channel arranged in the protruding

part on the second fastening section and the outlet of the trough hole in the second fastening section are arranged on different sides of the first fastening section in the fastening device locking state, whereby the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section might be arranged on opposite sides of the first fastening section in the fastening device locking state (not shown in the figure).

As shown in both the embodiment according to figure 1, and being more clearly visible from figure 2, it is preferable to arrange the inlet 16 and/or the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 adjacent to the surface of the first fastening section 6 in the fastening device locking state for minimizing any play in the locking device between the first fastening section 6 and the second fastening section 8, but it is also possible to arrange the inlet 16 and the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 somewhat distanced from the surface of the first fastening section 6 in the fastening device locking state, whereby some play may occur in the locking device between the first fastening section 6 and the second fastening section 8.

The first fastening section 6 is preferably detachably securely locked to the second fastening section 8 when said implant device feed member 20 is in place in the trough channel 14 and protrudes from both the inlet 16 and the outlet 18 of said trough channel 14, by that it is possible to remove the implant device feed member 20 from the trough channel 14, where after it is possible to detach the first fastening section 6 from the second fastening section 8, this without any substantial effort and without having to deform any parts of the fastening device 2.

The implant device feed member 20 may or may not be detachably or non-detachably attached to the implant device 4.

The implant device feed member 20 may be arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals between the implant device 4 and a remote unit 24, e.g. that the implant device feed member 20 is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals to and /or from the implant device 4.

As can be seen from the figure, the implant device 4 may be arranged to be fastened around a body part or another implanted device or member 26. Said body part may e.g. be at least one of a stomach or divided part of the stomach, an intestine, a closing sphincter and other part of the food passageway. Said body part may e.g. be at least one of an urethra and other part of the urinary tract. Said body part may e.g. be a blood vessel or heart. Said body part may e.g. be a vas deferens or uterine tube.

Fig. 2 shows schematically fastening sections 6, 8 of a fastening device 2 according to one exemplary embodiment of the invention, where a first fastening section 6 is arranged with a through hole 10, a second fastening section 8 is arranged with a protruding part 12, and where said protruding part 12 is in place in said trough hole 10 in a fastening device locking state (figure 2 shows an locked fastening device state). As can be seen from the figure, the protruding part 12 on the second fastening section 8 is arranged with a trough channel 14 having an inlet 16 and an outlet 18, said through channel 14 being arranged to receive an implant device feed member 20, said inlet 16 and outlet 18 being accessible from the exterior 1, 3 of the fastening device 2 in said fastening device locking state, wherein the first fastening section 6 is securely locked to the second fastening section 8 when, in shown fastening device locking state, said implant device feed member 20 is in place in the trough channel 14 and protrudes from both the inlet 16 and the outlet 18 of said trough channel 14.

According to the embodiment shown in figure 2, which is a detailed partial cross-section of the embodiment shown in figure 1, band shaped cross-section is shown for both the first fastening section 6 and the second fastening section 8, and both the first and the second fastening sections 6, 8 are arranged on the same fastening unit 22, and the inlet 16 and the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 are arranged on the same side of the first fastening section 6 in the fastening device locking state.

As shown in both the embodiment according to figure 1, and being more clearly visible from figure 2, it is preferable to arrange the inlet 16 and/or the outlet 18 (in this embodiment both the inlet 16 and the outlet 16) of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 adjacent to the surface of the first fastening section 6 in the

fastening device locking state for minimizing any play in the locking device between the first fastening section 6 and the second fastening section 8.

5 Fig. 3 shows schematically fastening sections 6, 8 of a fastening device 2 according to another exemplary embodiment of the invention, which embodiment differs from the one described in figure 2, in that a cylindrical shaped cross-section is shown for both the first fastening section 6 and the second fastening section 8.

10 Fig. 4 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, which embodiment differs from the one described in figure 2, in that a tubular cross-section is shown for both the first fastening section 6 and the second fastening section 8. As is shown in the figure, the trough hole 10 is arranged at least through one wall 9, 11 of the tubular first fastening section 6.

15 Fig. 5 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, which embodiment differs from the one described in figure 4, in that a tubular cross-section is shown for the first fastening section 6 and a cylindrical cross-section is shown for the second fastening section 8. As is shown in the figure, the trough hole 10 is arranged at least through one wall 9, 11 of the tubular first
20 fastening section 6, and the protruding part 12 arranged on the second fastening section 8 is arranged to protrude substantially axially A from one end 7 of the second fastening section 8.

As can be seen from the figure, in this embodiment the inlet 16 and the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 are arranged
25 on opposite sides of the second fastening section.

Fig. 6 shows schematically a fastening device 2 for an implant device 4 according to another exemplary embodiment of the invention, which embodiment differs from the one described in figure 1, in that the first and the second fastening sections 6, 8 are arranged on separate
30 fastening units 28, 30, and in that more than one, i.e. in this case two, of the fastening units 28, 30 are attached to the implant device 4 by attachment means 32, e.g. by chemical or mechanical means such as adhesive or suturing, and in that the implant device feed member

20 is attached to a fastening unit 30, and where the implant device feed member 20 is detachably attached to the implant device 4 via a connector device 34.

5 Fig. 7 shows schematically a fastening device 2 for an implant device 4 according to a yet another exemplary embodiment of the invention, which embodiment differs from the one described in figure 1, in that the first and the second fastening sections 6, 8 are arranged on separate fastening units 28, 30, and in that only one 28 of the fastening units 28, 30 is attached to the implant device 4 by attachment means 32, e.g. by chemical or mechanical means such as adhesive or suturing, the other fastening unit 30 having a loop 36 placed
10 around the to the implant device 4 attached fastening unit 28, and in that the implant device feed member 20 is attached to a fastening unit 30, and where the implant device feed member 20 is non-detachably attached to the implant device 4.

Fig. 8 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, where a first fastening section 6 is arranged
15 with a through hole 10, a second fastening section 8 is arranged with a protruding part 12, and where said protruding part 12 is in place in said through hole 10 in a fastening device locking state (figure 8 shows an locked fastening device state). As can be seen from the figure, the protruding part 12 on the second fastening section 8 is arranged with a trough channel 14
20 having an inlet 16 and an outlet 18, said through channel 14 being arranged to receive an implant device feed member 20, said inlet 16 and outlet 18 being accessible from the exterior 1, 3 of the fastening device 2 in said fastening device locking state, wherein the first fastening section 6 is securely locked to the second fastening section 8 when, in shown fastening device locking state, said implant device feed member 20 is in place in the trough channel 14 and
25 protrudes from both the inlet 16 and the outlet 18 of said trough channel 14.

The embodiment shown in figure 8 differs from the one described in figure 1, in that the inlet 16 and the outlet 18 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 are arranged on different sides, in this case on opposite sides 1, 3, of the
30 first fastening section 6 in the fastening device locking state. The inlet 16 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 is arranged to connect to an outlet 38 of a trough hole 40 arranged in the second fastening section 8, wherein the inlet 16 of the trough channel 14 arranged in the protruding part 12 on the second

fastening section 8 and the outlet 18 of the trough channel 14 in the second fastening section 8 are arranged on different sides of the first fastening section 6 in the fastening device locking state.

5 As seen in the figure, the trough channel 14 does not have to be linear, in this embodiment the trough channel 14 is bent in order to arrange the inlet 16 of the trough channel 14 arranged in the protruding part 12 on the second fastening section 8 adjacent to the surface of the first fastening section 6 in the fastening device locking state for minimizing any play in the locking device between the first fastening section 6 and the second fastening section 8. This
10 may also be achieved by arranging a depression 44 in the surface of the first fastening section 6, thereby providing a “channel” for the implant device feed member 20 in said surface. A combination of these two separate embodiments is shown in the figure.

Fig. 9 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet
15 another exemplary embodiment of the invention, where the embodiment shown in figure 9 differs from the one described in figure 2, in that the protruding part 12 arranged on the second fastening section 8 is arranged to protrude substantially perpendicular to the longitudinal axis A of the second fastening section 8, and from one end of the second fastening section 8.

20

Fig. 10 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, where the embodiment shown in figure 10 differs from the one described in figure 2, in that the protruding part 12 arranged on the second fastening section 8 is arranged adjacent to one end of the second fastening section 8.

25

Fig. 11 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, where the embodiment shown in figure 11 differs from the one described in figure 2, in that the trough hole 10 arranged in the first fastening section 6 is arranged at an angle to the longitudinal axis B of the first fastening
30 section 6 that the protruding part 12 arranged on the second fastening section 8 is arranged at an angle to the longitudinal axis A of the second fastening section 8.

Fig. 12 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, where the embodiment shown in figure 12 differs from the one described in figure 2, in that the protruding part 12 is an integrated part of the second fastening section 8.

5

Fig. 13 shows schematically fastening sections 6, 8 of a fastening device 2 according to yet another exemplary embodiment of the invention, where the embodiment shown in figure 13 differs from the one described in figure 2, in that the first fastening section 6 is arranged with more than one trough hole 10, 13 in order to be able to lock the fastening device 2 in more than one fastening device locking state.

10

Fig. 14 shows schematically fastening sections of a fastening device according to yet another exemplary embodiment of the invention, where the embodiment shown in figure 14 differs from the one described in figure 2, in that the first fastening section 6 is arranged with more than one trough hole 10, 13, and in that the second fastening section 8 is arranged with more than one protruding part 12, 15 in order to be able to lock the fastening device 2 in more than one fastening device locking state, i.e. the fastening device 2 is adapted to create two or more locking positions, said fastening device 2 comprising two or more protruding parts 12, 15 and two or more through going holes 10, 13, wherein a first through going hole 10 is placed more distal to the second or more through going hole 13 to include any one of the protruding parts 12, 15 inside said first through going hole 10, thus creating two or more locking positions.

15

20

Fig. 15 shows schematically an implant device according to yet another exemplary embodiment of the invention. The invention also relates to a fastening device 2, wherein the implantable implant device 4 comprises a restriction device 104 and wherein the fastening device 2 is adapted to create a closed loop by fastening said restriction device 104. The invention also relates to a fastening device 2, wherein the implant device 4 comprises at least two implant device parts 106, 108 placed remote from each other, and wherein said implant device feed member 20 is adapted to be connected to at least said two parts 106, 108, when said implant 4 is implanted in a mammal body. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises an internal energy source 110. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises an internal wireless energy

25

30

receiver 112 adapted to receive wireless energy for supplying energy to any of the energy consuming parts of said implant device 4. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises a pump 114. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises a motor 115. The invention also relates to a fastening device 2, wherein said implant device 4 is an adjustable electrically powered implant device 4, comprising a restriction device 104, and a power supply 118 for powering an adjustment of said restriction device 104, wherein said fastening device 2 is adapted to fasten said first and second fastening sections 106, 108 included in said restriction device 104 into a closed loop and wherein said restriction device 104 and said power supply 118 is electrically connected by a electric cable 120, wherein said cable 120 comprising the implant feed member 20.

Fig. 16 shows schematically an implant device according to yet another exemplary embodiment of the invention. The invention also relates to a fastening device 2, wherein the implantable implant device 4 comprises a restriction device 104 and wherein the fastening device 2 is adapted to create a closed loop by fastening said restriction device 104. The invention also relates to a fastening device 2, wherein the implant device 4 comprises at least two implant device parts 106, 108 placed remote from each other, and wherein said implant device feed member 20 is adapted to be connected to at least said two parts 106, 108, when said implant 4 is implanted in a mammal body. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises an internal energy source 110. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises an internal wireless energy receiver 112 adapted to receive wireless energy for supplying energy to any of the energy consuming parts of said implant device 4. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises a pump 114. The invention also relates to a fastening device 2, wherein at least one of said implant device parts 106, 108 optionally comprises a motor 115. The invention also relates to a fastening device 2, wherein said implant device 4 is an adjustable hydraulically implant device, comprising a restriction device 104, and a pump 114 for moving hydraulic fluid to and from said restriction device 104, wherein said fastening device 2 is adapted to fasten said first and second fastening sections 106, 108 included in said restriction device 104 into a closed loop

and wherein said restriction device 104 and said pump 114 is hydraulically connected by a hydraulic tube 116, wherein said tube 116 comprises the implant feed member 20.

- 5 The invention further relates to a method for securely locking a first fastening section 6 of a fastening device 2 for an implant device 4 to a second fastening section 8 of a fastening device 2 for an implant device 4, the fastening device 2 comprising at least two fastening sections 6, 8, where the first fastening section 6 is arranged with a through hole 10 and the second fastening section 8 is arranged with a protruding part 12, and where a fastening device locking state is defined by said protruding part 12 being placed in place in said trough hole 10, where the method comprises the steps of:
- 10 - arranging, on the protruding part 12 on the second fastening section 8, a trough channel 14 having an inlet 16 and an outlet 18, said through channel 14 being arranged to receive an implant device feed member 20, said inlet 16 and outlet 18 being accessible from the exterior 1, 3 of the fastening device 2 in said fastening device locking state,
- 15 - placing said implant device feed member 20 in the trough channel 14, and
- securely locking the first fastening section 6 to the second fastening section 8 by arranging, in said fastening device locking state, said implant device feed member 20 to protrude from both the inlet 16 and the outlet 18 of said trough channel 14.
- 20 The invention also relates to an operation method for implanting a medical implant comprising a fastening device as described herein, the method comprising the steps of inserting a needle or tube-like instrument into a cavity of said mammal patient; inflating said cavity by introducing a fluid through said needle or tube-like instrument and thereby expanding said cavity;
- 25 placing at least two laparoscopic trocars in said cavity;
- inserting a camera through one of said laparoscopic trocars into said cavity;
- inserting at least one dissecting tool through one of said at least two laparoscopic trocars; dissecting an area of the body;
- placing the implant with the fastening device in the dissected area;
- 30 locking a first fastening section of a fastening device for the implant device to a second fastening section of the fastening device, the fastening device comprising at least two fastening sections, where the first fastening section is arranged with a through hole and the

second fastening section is arranged with a protruding part, and where a fastening device locking state is defined by said protruding part being placed in place in said trough hole, arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state, placing said implant device feed member in the trough channel, and securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel,

The invention also relates to an for implanting a medical implant comprising a fastening device as described herein, the method comprising the steps of cutting the skin of said human patient;

dissecting an area of body; placing the implant in the dissected area; locking a first fastening section of a fastening device for the implant device to a second fastening section of the fastening device, the fastening device comprising at least two fastening sections, where the first fastening section is arranged with a through hole and the second fastening section is arranged with a protruding part, and where a fastening device locking state is defined by said protruding part being placed in place in said trough hole, arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state, placing said implant device feed member in the trough channel, and securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel.

The invention also relates to a method of treating a mammal patient according to any one of above described operation methods, further comprising the step of withdrawing the instruments.

The invention also relates to a method of treating a mammal patient according to any one of above described operation methods, further comprising the step of closing the skin using sutures or staples.

5

The invention also relates to a method of treating a mammal patient according to any one of above described operation methods, wherein the step of dissecting includes dissecting an area of the abdomen or thorax or retroperitoneal space or pelvic region, comprising, dissecting an area of at least one of the following organs esophagus, stomach, intestine, colon, rectum, anus, anal sphincter, cardia sphincter, pylori sphincter, urethra, ureter, urine bladder, vas deferens, uterine tube, blood vessel, and heart.

10

The invention also relates to a method of treating a mammal patient according to any one of above described operation methods, wherein the implantable device comprise a restriction device and the fastening device is adapted to create a closed loop by fastening said restriction device, wherein the method comprising the step of fastening said fastening device creating a closed loop.

15

The invention also relates to an implant device 4 comprising a fastening device 2 as described in any of the above embodiments, or possible combinations thereof.

20

Please note that all the embodiments or features of an embodiment as well as any method or step of a method could be combined in any way if such combination is not clearly contradictory. Please also note that the description in general should be seen as describing both an apparatus or device adapted to perform a method as well as this method in itself.

25

While specific embodiments of the invention have been illustrated and described herein, it is realized that numerous other embodiments may be envisaged and that numerous additional advantages, modifications and changes will readily occur to those skilled in the art without departing from the spirit and scope of the invention. Therefore, the invention in its broader aspects is not limited to the specific details, representative devices and illustrated examples shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents. It is therefore to be understood that the appended claims are

30

intended to cover all such modifications and changes as fall within a true spirit and scope of the invention. Numerous other embodiments may be envisaged without departing from the spirit and scope of the invention.

CLAIMS

1. A fastening device for implant device, the fastening device comprising at least two fastening sections, where a first fastening section is arranged with a through hole, a second fastening section is arranged with a protruding part, and where said protruding part is in place in said through hole in a fastening device locking state, wherein the implant device is adjustable and connected to an implant device feed member, **characterized in** that the protruding part on the second fastening section is arranged with a trough channel having an inlet and an outlet, said through channel being arranged to receive the implant device feed member, wherein the implant device feed member is arranged to be a locking member and for being involved in the adjustment of the implant device by feeding at least one of a hydraulic or pneumatic fluid, electrical energy and an electrical signal to the implant device, wherein said inlet and outlet is accessible from the exterior of the fastening device in said fastening device locking state, wherein the first fastening section is detachably and securely locked to the second fastening section when, in said fastening device locking state, said implant device feed member is in place in the trough channel and protrudes from both the inlet and the outlet of said trough channel, wherein said fastening device is adapted to be reversible in two steps, involving to remove said implant device feed member from the through channel and thereafter detaching the first fastening section from the second fastening section.
2. The fastening device as claimed in claim 1, wherein the first fastening section has e.g. a cylindrical, tubular or band shaped cross-section.
3. The fastening device as claimed in claim 2, wherein the first fastening section has a tubular cross-section, and that the through hole is arranged at least through one wall of the tubular first fastening section.
4. The fastening device as claimed in claim 1, wherein the second fastening section has e.g. a cylindrical, tubular or band shaped cross-section.
5. The fastening device as claimed in claim 1, wherein the first and the second fastening sections are arranged on the same fastening unit.

6. The fastening device as claimed in claim 5, wherein the fastening unit is attached to the implant device.
7. The fastening device as claimed in claim 5, wherein the implant device feed member is attached to the fastening unit.
- 5 8. The fastening device as claimed in claim 1, wherein the first and the second fastening sections are arranged on separate fastening units.
9. The fastening device as claimed in claim 8, wherein at least one of the fastening units is attached to the implant device.
- 10 10. The fastening device as claimed in claim 8, wherein the implant device feed member is attached to a fastening unit.
11. The fastening device as claimed in claim 1, wherein the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on the same side of the first fastening section in the fastening device locking state.
- 15 12. The fastening device as claimed in claim 1, wherein the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on different sides of the first fastening section in the fastening device locking state.
- 20 13. The fastening device as claimed in claim 1, wherein the outlet of the trough channel arranged in the protruding part on the second fastening section is arranged to connect to an inlet of a trough hole arranged in the second fastening section, wherein the inlet of the trough channel arranged in the protruding part on the second fastening section and the outlet of the trough hole in the second fastening section are arranged on different sides of the first fastening section in the fastening device locking state.
- 25 14. The fastening device as claimed in claim 12, wherein the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on opposite sides of the first fastening section in the fastening device locking state.

15. The fastening device as claimed in claim 1, wherein the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged adjacent the surface of the first fastening section in the fastening device locking state.

5 16. The fastening device as claimed in claim 1, wherein the protruding part arranged on the second fastening section is arranged to protrude substantially axially from one end of the second fastening section.

10 17. The fastening device as claimed in claim 16, wherein the inlet and the outlet of the trough channel arranged in the protruding part on the second fastening section are arranged on different sides of the second fastening section.

18. The fastening device as claimed in claim 1, wherein the protruding part arranged on the second fastening section is arranged to protrude substantially perpendicular to the longitudinal axis of the second fastening section, and from one end of the second fastening section.

15 19. The fastening device as claimed in claim 1, wherein the protruding part arranged on the second fastening section is arranged to protrude substantially perpendicular to the longitudinal axis of the second fastening section.

20 20. The fastening device as claimed in claim 19, wherein the protruding part arranged on the second fastening section is arranged adjacent to one end of the second fastening section.

21. The fastening device as claimed in claim 1, wherein the trough hole arranged in the first fastening section is arranged at an angle to the longitudinal axis of the first fastening section.

25 22. The fastening device as claimed in claim 1, wherein the protruding part arranged on the second fastening section is arranged at an angle to the longitudinal axis of the second fastening section.

23. The fastening device as claimed in claim 1, wherein the trough hole arranged in the first fastening section is arranged substantially perpendicular to the longitudinal axis of the first fastening section.

24. The fastening device as claimed in claim 1, wherein the implant device feed member is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals between the implant device and a remote unit.

25. The fastening device as claimed in claim 24, wherein the implant device feed member is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals to the implant device.

26. The fastening device as claimed in claim 24, wherein the implant device feed member is arranged to feed hydraulic fluid, pneumatic fluid, or electrical energy or electrical signals from the implant device.

27. The fastening device as claimed in claim 1, wherein the first fastening section is detachably securely locked to the second fastening section when said implant device feed member is in place in the trough channel and protrudes from both the inlet and the outlet of said trough channel.

28. The fastening device as claimed in claim 1, wherein the implant device feed member is attached to the implant device.

29. The fastening device as claimed in claim 28, wherein the implant device feed member is detachably attached to the implant device.

30. The fastening device as claimed in claim 1, wherein the protruding part is an integrated part of the second fastening section.

31. The fastening device as claimed in claim 1, wherein the implant device is arranged to be fastened around a body part or another implanted device or member.

32. The fastening device as claimed in claim 1, wherein the first fastening section is arranged with more than one trough hole in order to be able to lock the fastening device in more than one fastening device locking state.

33. The fastening device as claimed in claim 1, wherein the implant device is arranged to be fastened around at least one of a stomach or divided part of the stomach, an intestine, a closing sphincter and other part of the food passageway.

34. The fastening device as claimed in claim 1, wherein the implant device is arranged to be fastened around at least one of a urethra and other part of the urinary tract.

35. The fastening device as claimed in claim 1, wherein the implant device is arranged to be fastened around a blood vessel or heart.

5 36. The fastening device as claimed in claim 1, wherein the implant device is arranged to be fastened around a vas deferens or uterine tube.

37. The fastening device according to any one of claims 1 and 36, wherein the implantable implant device comprises a restriction device and wherein the fastening device is adapted to create a closed loop by fastening said restriction device.

10 38. The fastening device according to any one of claims 1 and 36, wherein the fastening device is adapted to create two or more locking positions, said fastening device comprises two or more protruding parts and two or more through going holes, wherein a first through going hole placed more distal to the second or more through going holes are placed to include anyone of the protruding parts inside said first through going hole, thus
15 creating two or more locking positions.

39. The fastening device according to any one of claims 1 and 36, wherein the implant device comprises at least two implant device parts placed remote from each other, and wherein said implant device feed member is adapted to be connected to at least said two parts, when said implant is implanted in a mammal body.

20 40. The fastening device according to any one of claims 39, wherein at least one of said implant device parts comprises an internal energy source.

41. The fastening device according to any one of claims 39, wherein at least one of said implant device parts comprises an internal wireless energy receiver adapted to receive wireless energy for supplying energy to any of the energy consuming parts of said implant
25 device.

42. The fastening device according to any one of claims 39, wherein at least one of said implant device parts comprises a pump.

43. The fastening device according to any one of claims 39, wherein at least one of said implant device parts comprises a motor.

44. The fastening device according to any one of claims 1-36 and 39, wherein said implant device is an adjustable hydraulically implant device, comprising a restriction device, and a pump for moving hydraulic fluid to and from said restriction device, wherein said fastening device is adapted to fasten said first and second fastening sections included in said restriction device into a closed loop and wherein said restriction device and said pump is hydraulically connected by a hydraulic tube, wherein said tube comprising the implant feed member.

45. The fastening device according to any one of claims 1-36 and 39, wherein said implant device is an adjustable electrically powered implant device, comprising a restriction device, and a power supply for powering an adjustment of said restriction device, wherein said fastening device is adapted to fasten said first and second fastening sections included in said restriction device into a closed loop and wherein said restriction device and said power supply is electrically connected by a electric cable, wherein said cable comprising the implant feed member.

46. The fastening device according to any one of claims 1-44, wherein said implant feed device member is arranged to be in contact with at least one of said first fastening section and said second fastening section, when locked in said locking state.

47. The fastening device according to any one of claims 1-44 and 46, wherein said first and second fastening sections are in contact with each other when locked in said locking state.

48. Implant device, wherein the implant device comprises a fastening device as claimed in any one of claims 1-47.

49. A method for securely locking a first fastening section of a fastening device for an implant device to a second fastening section of a fastening device for an implant device, the fastening device comprising at least two fastening sections, where the first fastening section is arranged with a through hole and the second fastening section is arranged with a protruding part, and where a fastening device locking state is defined by

said protruding part being placed in place in said trough hole, **characterized in**, that the method comprises the steps of:

- 5 - arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state,
- placing said implant device feed member in the trough channel, and
- 10 - securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel.

50. An operation method for implanting a medical implant comprising a fastening device according to claim 1, the method comprising the steps of

- inserting a needle or tube-like instrument into a cavity of a mammal patient;
- 15 - inflating said cavity by introducing a fluid through said needle or tube-like instrument and thereby expanding said cavity;
- placing at least two laparoscopic trocars in said cavity;
- inserting a camera through one of said laparoscopic trocars into said cavity;
- inserting at least one dissecting tool through one of said at least two laparoscopic trocars;
- 20 - dissecting an area of the body;
- placing the implant with the fastening device in the dissected area;
- locking a first fastening section of a fastening device for the implant device to a second fastening section of the fastening device, the fastening device comprising at least two fastening sections, where the first fastening section is arranged with a through hole and the second fastening section is arranged with a protruding part, and where a fastening device locking state is defined by said protruding part being placed in place in said trough hole,
- 25

- arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state,

- 5
- placing said implant device feed member in the trough channel, and
 - securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel,

10 51. An operation method for implanting a medical implant comprising a fastening device according to claim 1, the method comprising the steps of

- cutting the skin of a human patient;
 - dissecting an area of body;
 - placing the implant in the dissected area;
 - locking a first fastening section of a fastening device for the implant device to a
- 15 second fastening section of the fastening device, the fastening device comprising at least two fastening sections, where the first fastening section is arranged with a through hole and the second fastening section is arranged with a protruding part, and where a fastening device locking state is defined by said protruding part being placed in place in said trough hole,

- 20
- arranging, on the protruding part on the second fastening section, a trough channel having an inlet and an outlet, said through channel being arranged to receive an implant device feed member, said inlet and outlet being accessible from the exterior of the fastening device in said fastening device locking state,
 - placing said implant device feed member in the trough channel, and
- 25
- securely locking the first fastening section to the second fastening section by arranging, in said fastening device locking state, said implant device feed member to protrude from both the inlet and the outlet of said trough channel.

52. The operation method according to claim 50 or 51, further comprising the step of withdrawing the instruments.

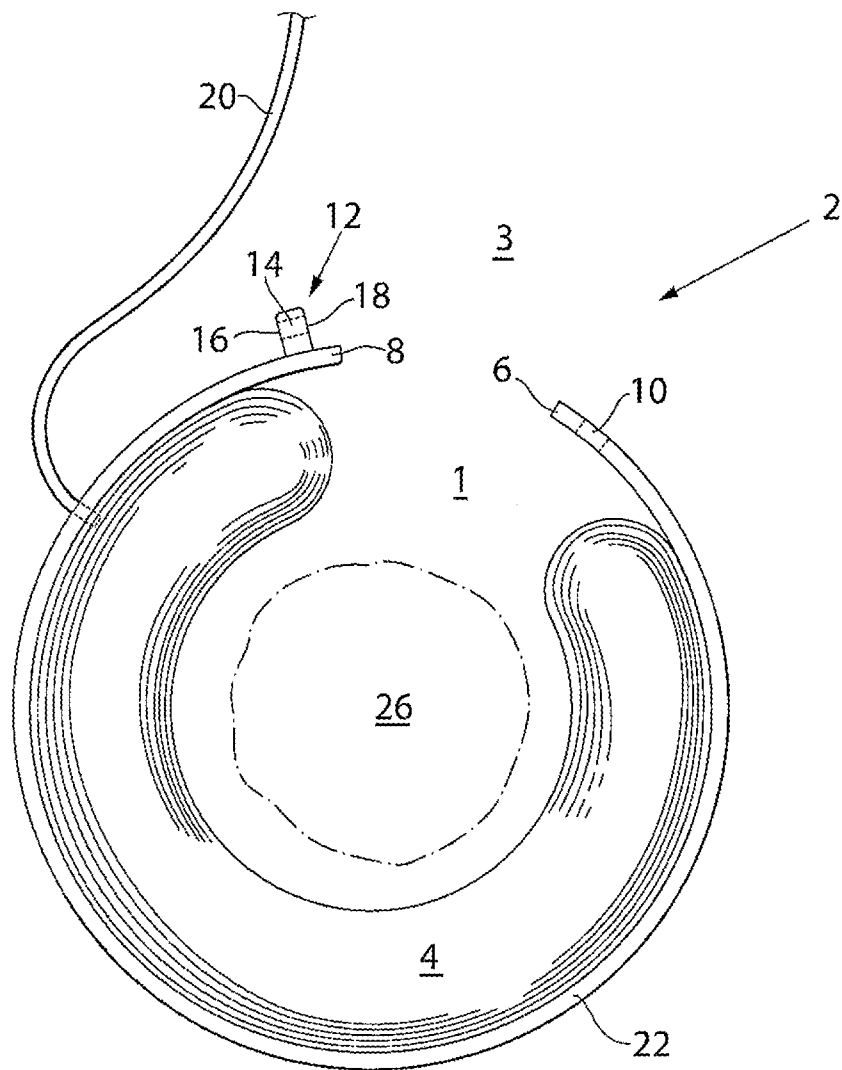
53. The operation method according to claim 50 or 51, further comprising the step of closing the skin using sutures or staples.

5 54. The operation method according to claim 50 or 51, wherein the step of dissecting includes dissecting an area of the abdomen or thorax or retroperitoneal space or pelvic region, comprising, dissecting an area of at least one of the following organs esophagus, stomach, intestine, colon, rectum, anus, anal sphincter, cardia sphincter, pylori sphincter, urethra, ureter, urine bladder, vas deferens, uterine tube, blood vessel, and heart.

10 55. The operation method according to claim 50 or 51, wherein the implantable device comprises a restriction device and the fastening device is adapted to create a closed loop by fastening said restriction device, wherein the method comprising the step of fastening said fastening device creating a closed loop.

1/8

Fig. 1



2/8

Fig. 2

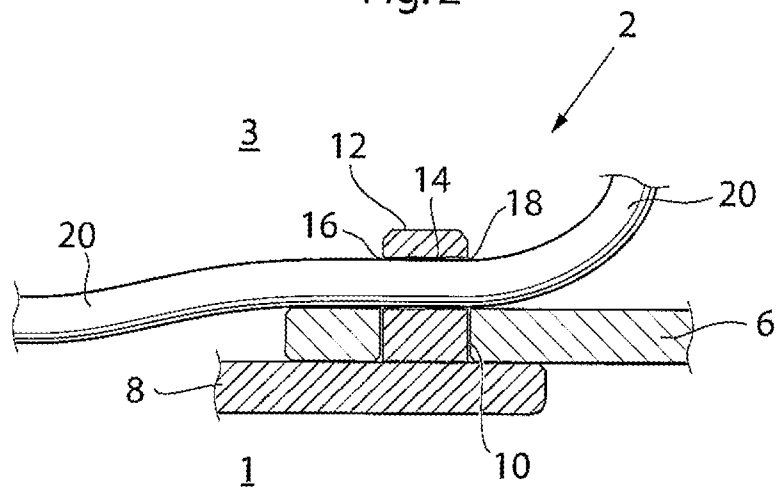


Fig. 3

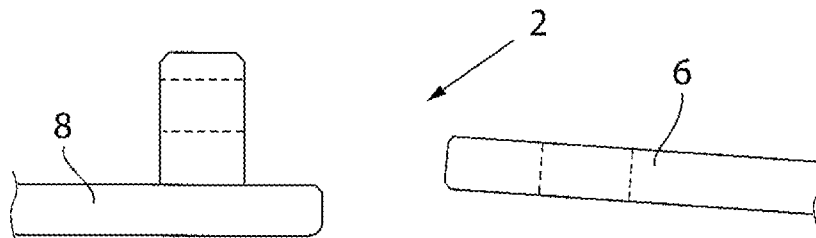
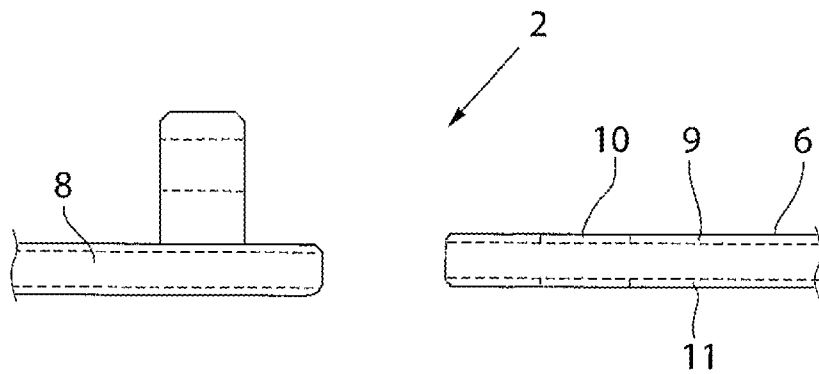


Fig. 4



3/8

Fig. 5

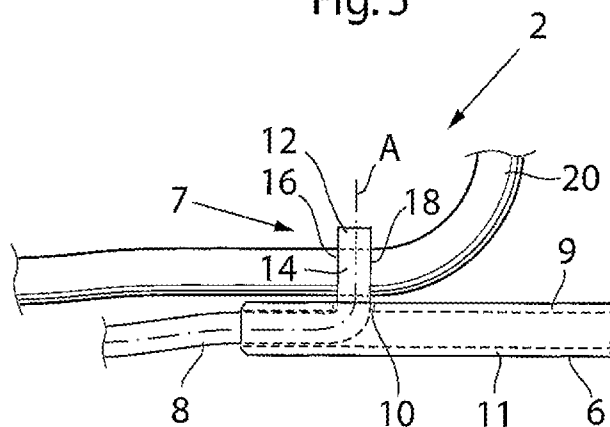
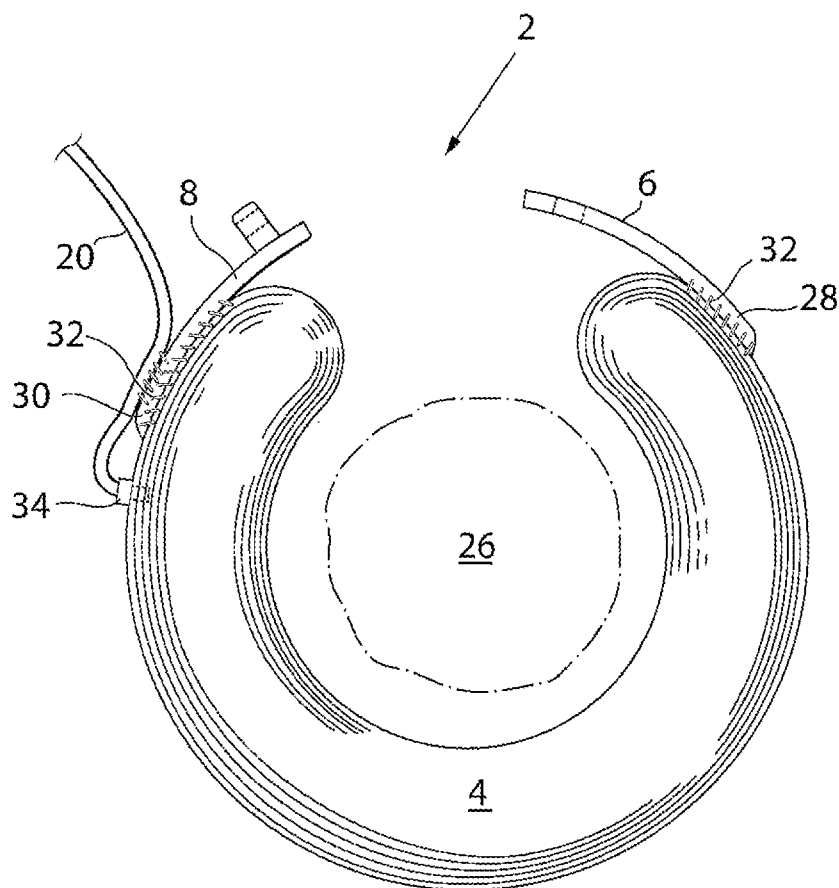


Fig. 6



4/8

Fig. 7

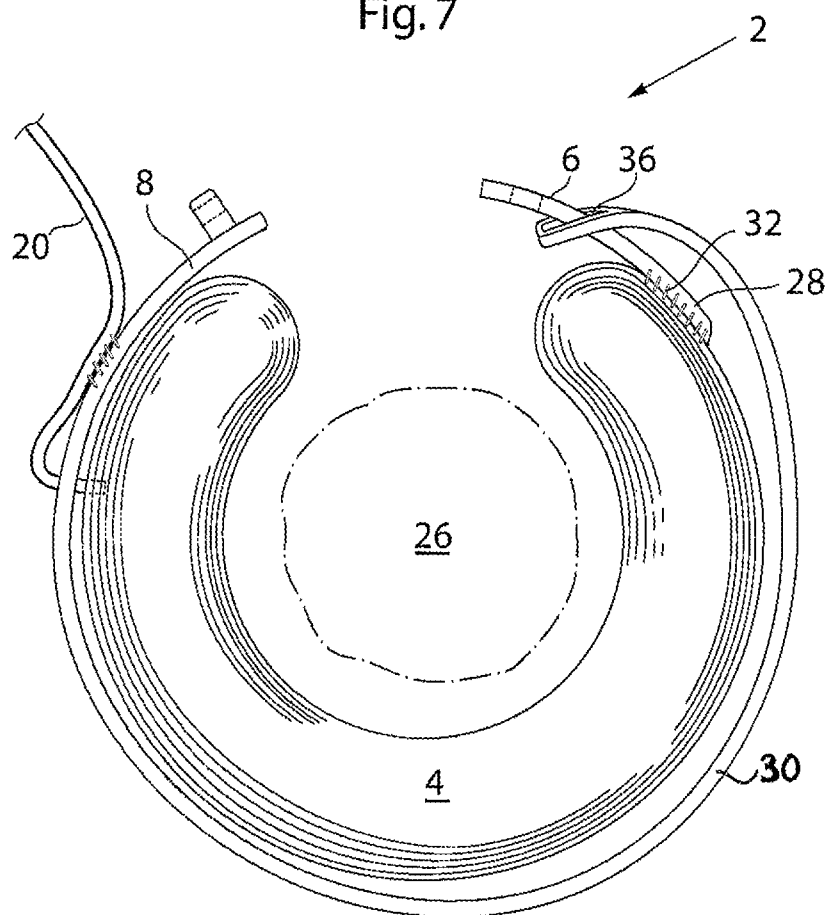
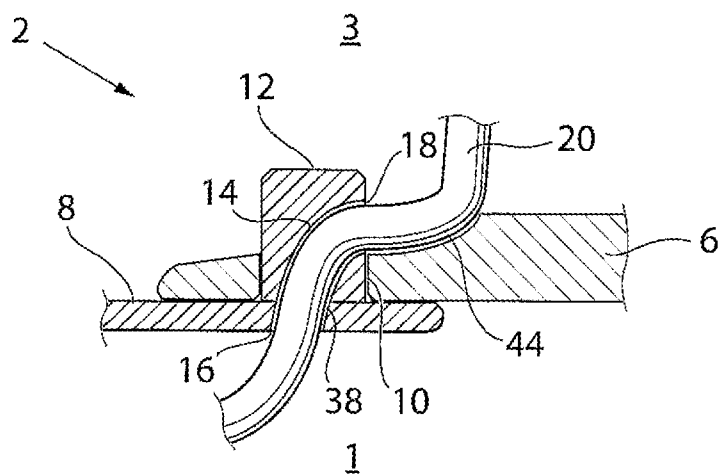


Fig. 8



5/8

Fig. 9

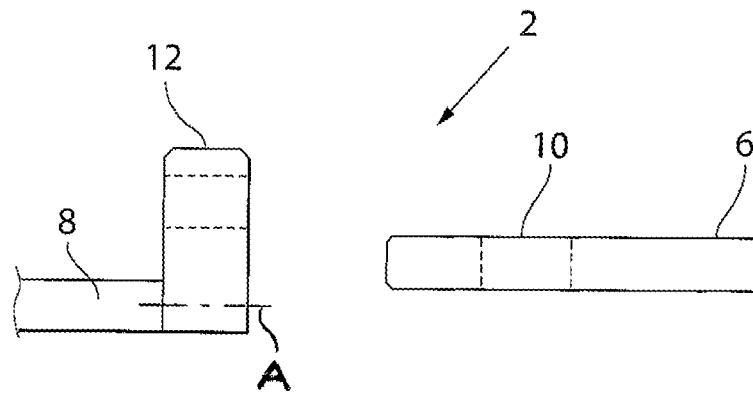


Fig. 10

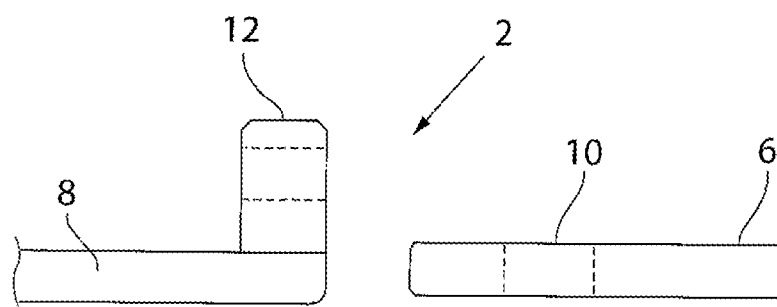
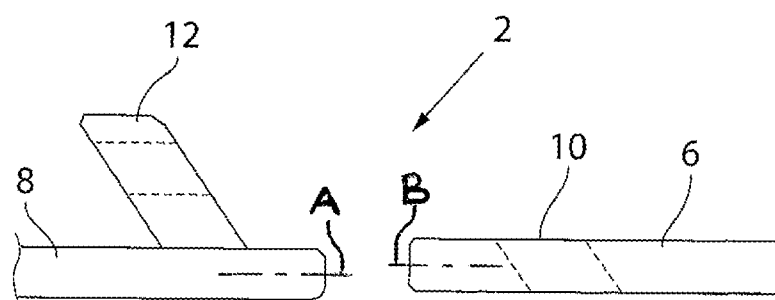


Fig. 11



6/8

Fig. 12

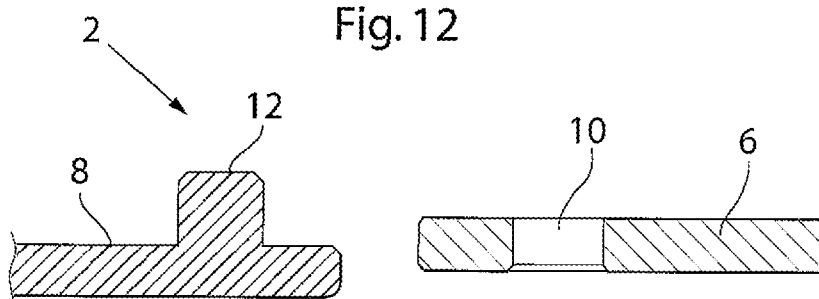


Fig. 13

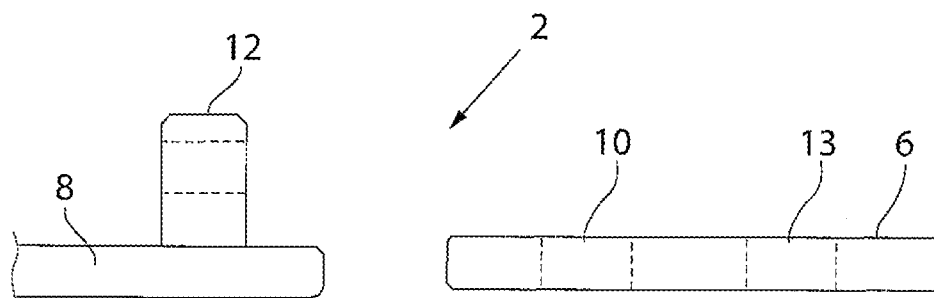


Fig. 14

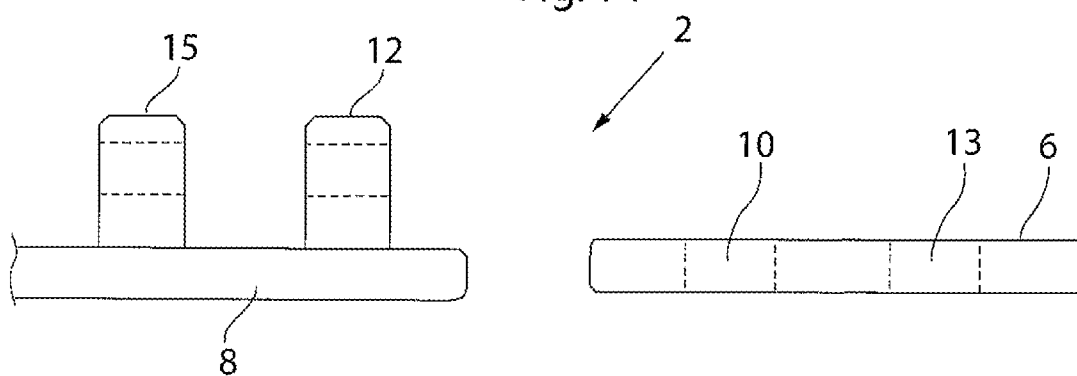


Fig.15

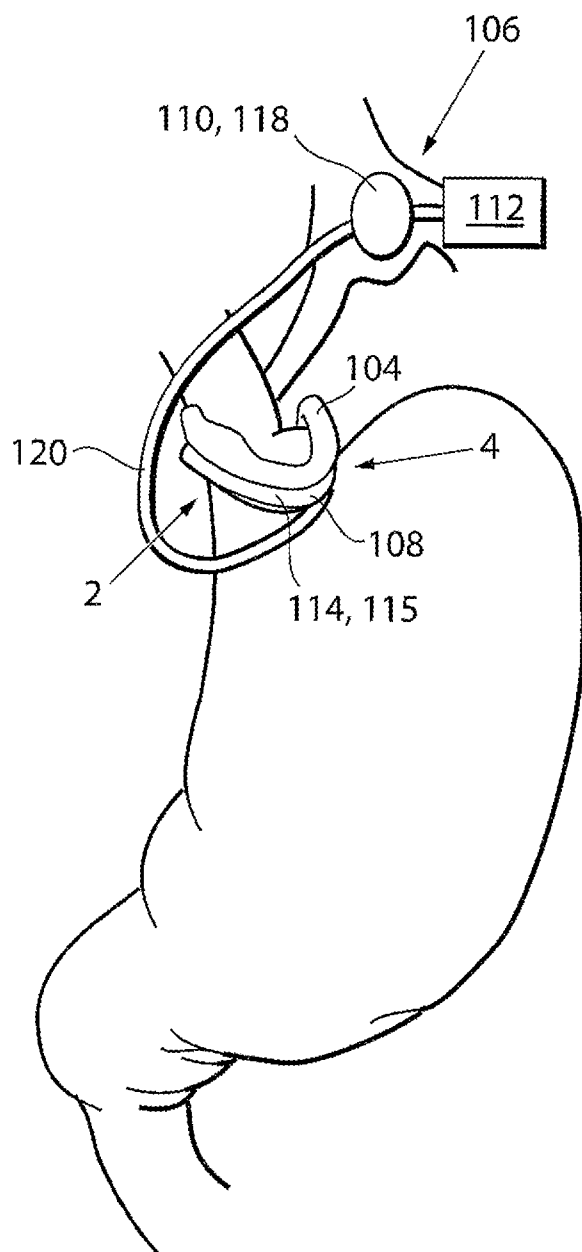
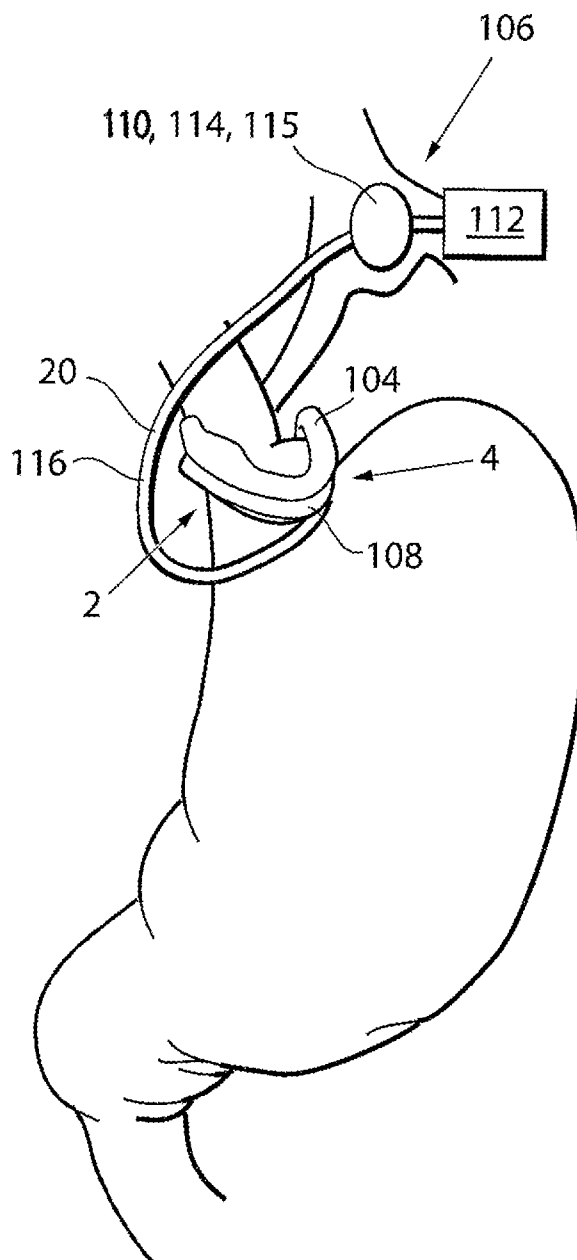


Fig.16



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2010/051177

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A61B, A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007080334 A2 (SURGICAL-IOC), 19 July 2007 (19.07.2007), page 6, line 20 - line 27, figure 6, abstract --	1-55
A	US 6511490 B2 (ROBERT), 28 January 2003 (28.01.2003), figure 2, abstract --	1-55
A	US 3756239 A (SMYTHE), 4 Sept 1973 (04.09.1973), whole document --	1-55
A	US 6450173 B1 (FORSELL), 17 Sept 2002 (17.09.2002), figure 12, abstract -- -----	1-55

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

22 February 2011

Date of mailing of the international search report

23 -02- 2011

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Björn Lindkvist / JA A
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2010/051177

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 49-55
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 49-55 relate to a method for treatment of the human or animal body by surgery or by therapy, as well as diagnostic methods, see PCT rule 39.1(iv).
.../...
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2010/051177

Box II.1

Nevertheless, a search has been made for these claims. The search has been directed to the technical content of the claims.

International patent classification (IPC)**A61B 17/12** (2006.01)**A61F 2/00** (2006.01)**A61F 5/00** (2006.01)**Download your patent documents at www.prv.se**

The cited patent documents can be downloaded:

- From "Cited documents" found under our online services at www.prv.se (English version)
- From "Anförda dokument" found under "e-tjänster" at www.prv.se (Swedish version)

Use the application number as username. The password is **CCZJZEXKRT**.

Paper copies can be ordered at a cost of 50 SEK per copy from PRV InterPat (telephone number 08-782 28 85).

Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE2010/051177

WO	2007080334	A2	19/07/2007	AU	2007204261	A	19/07/2007
				CA	2637104	A	19/07/2007
				EP	1981451	A	22/10/2008
				FR	2896148	A,B	31/10/2008
				JP	2009523478	T	25/06/2009
				RU	2008133568	A	27/02/2010
				US	20090306463	A	10/12/2009
				ZA	200806154	A	29/04/2009

US	6511490	B2	28/01/2003	US	20020198548	A	26/12/2002
----	---------	----	------------	----	-------------	---	------------

US	3756239	A	04/09/1973	NONE			
----	---------	---	------------	------	--	--	--

US	6450173	B1	17/09/2002	NONE			
----	---------	----	------------	------	--	--	--

专利名称(译)	紧固装置，植入装置，锁定方法和操作方法		
公开(公告)号	EP2493395A1	公开(公告)日	2012-09-05
申请号	EP2010827246	申请日	2010-10-29
[标]申请(专利权)人(译)	米卢克斯控股股份有限公司		
申请(专利权)人(译)	MILUX HOLDING SA		
当前申请(专利权)人(译)	KIRK推广有限公司.		
[标]发明人	FORSELL PETER		
发明人	FORSELL, PETER		
IPC分类号	A61B17/12 A61F2/00 A61F5/00		
CPC分类号	A61F5/0066 A61B17/12009		
代理机构(译)	豪格伦德，LARS		
优先权	61/255991 2009-10-29 US 0901391 2009-10-29 SE		
其他公开文献	EP2493395B1 EP2493395A4		
外部链接	Espacenet		

摘要(译)

本发明涉及一种用于植入装置的紧固装置，该紧固装置包括至少两个紧固部分，其中第一紧固部分设置有通孔，第二紧固部分设置有突出部分，并且其中所述突出部分是在紧固装置锁定状态下的所述槽孔中的适当位置，其中第二紧固部分上的突出部分设置有具有入口和出口的槽通道，所述通道设置成接收植入装置进给构件，所述入口在所述紧固装置锁定状态下，可从紧固装置的外部接近出口，其中，当在所述紧固装置锁定状态下，所述植入装置进给构件在所述紧固装置锁定状态下，所述第一紧固部分牢固地锁定到所述第二紧固部分。槽通道并从所述槽通道的入口和出口突出。本发明还涉及一种植入装置，其包括紧固装置，以及用于将植入装置的紧固装置的第一紧固部分牢固地锁定到用于植入装置的紧固装置的第二部分的方法。