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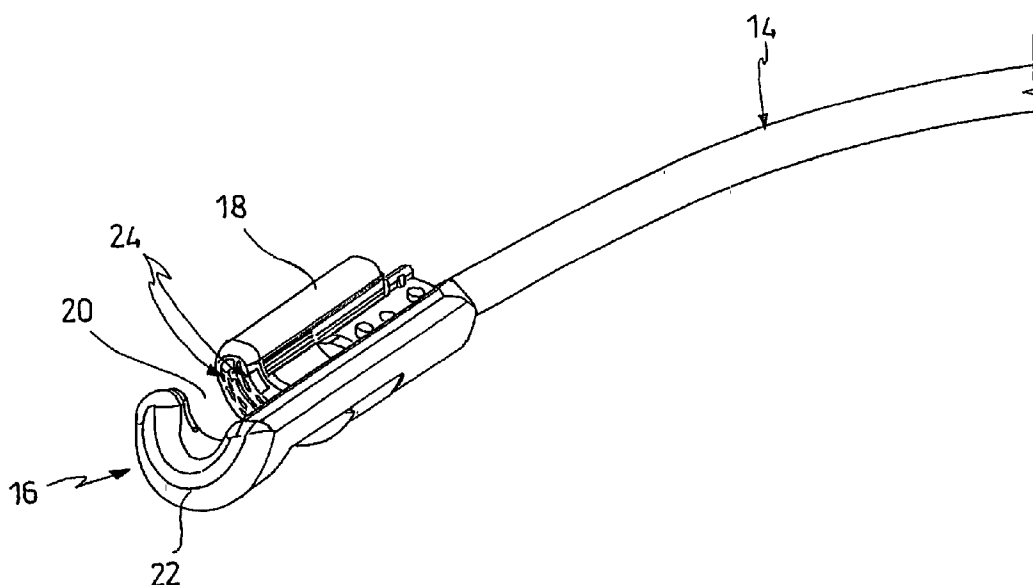
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(54) Title: A DEVICE, CLIP, ENDOSCOPE AND METHOD FOR THE INTRALUMINAL TREATMENT OF TISSUE, E.G. HEMORRHOIDS



(57) Abstract: A device for the intraluminal treatment of tissue comprises a handle, a shaft which extends from the handle and a head arranged at the distal end of the shaft, wherein the head comprises at least one jaw, movable between an open position, wherein it defines a window for the insertion of the tissue and surrounding tissue, and a closed position, and wherein the shaft extends between the handle and head in a curvilinear longitudinal direction.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

DESCRIPTION**"A device, clip, endoscope and method for the intraluminal treatment of tissue, e.g. hemorrhoids"**

The present invention relates to a device, clip,
5 anoscope and method for the intraluminal treatment of body tissue, e.g. for the transanal treatment of hemorrhoids or for intraluminal or endoscopic treatments of body tissue different from hemorrhoids.

Also object of the present invention is an
10 endoscope, e.g. an anoscope for the treatment of lower rectum pathologies, for example for the minimally-invasive surgical treatment of hemorrhoids.

Apart from endoscopic o intraluminal treatments of body tissue which is different from hemorrhoids, such
15 aspects of the invention are in particular correlated with the realization of a minimally-invasive surgical treatment for the treatment of so-called "internal" hemorrhoids, i.e. above the anorectal junction (dentate line).

20 One of the known methods of surgical treatment of hemorrhoids is the method of hemorrhoid ligation by means of a rubber elastic band wherein each hemorrhoid is inserted in a hollow cylindrical device, and a rubber elastic band is positioned on the hemorrhoid. The
25 compression exerted by the rubber elastic band

subsequently leads to the necrosis and thus the shedding of the tissue.

Such method, together with the devices employed, has several drawbacks. In particular, the rubber elastic band
5 cannot be deeply positioned, at the root of the hemorrhoid, and due to its elastic nature it tends to conform to the tissue, with the consequence that the treatment cannot be radical.

An additional method is known, known as PPH, along
10 with a corresponding application device of such method. The device is substantially composed of a circular stapler adapted to be inserted into the anal canal and stable and cut a ring of tissue which comprises the hemorrhoids. In this case, the cut affects the entire
15 section of the anal canal and produces a rather large wound.

The problem underlying the present invention is that of proposing a device, clip and method for the intraluminal treatment of body tissue, e.g. for the
20 transanal treatment of hemorrhoids or for intraluminal or endoscopic treatments of body tissue different from hemorrhoids which has structural and functional characteristics such to overcome the aforementioned drawbacks cited with reference to the prior art.

25 Such problem is solved by means of a device for the

intraluminal treatment of body tissue, e.g. for the transanal treatment of hemorrhoids or for intraluminal or endoscopic treatments of body tissue different from hemorrhoids in accordance with claim 1 or 16, a clip for
5 the intraluminal treatment of body tissue, e.g. for the transanal treatment of hemorrhoids or for intraluminal or endoscopic treatments of body tissue different from hemorrhoids in accordance with claim 7 and a method for the intraluminal treatment of body tissue, e.g. for the
10 transanal treatment of hemorrhoids or for intraluminal or endoscopic treatments of body tissue different from hemorrhoids in accordance with claim 21 or 42.

A further problem underlying the present invention is that of proposing an endoscope, e.g. an anoscope of
15 easy and effective use, in particular adapted for use in a method for the intraluminal treatment of body tissue, e.g. for the transanal treatment of hemorrhoids or for intraluminal or endoscopic treatments of body tissue different from hemorrhoids, for example together with the
20 abovementioned devices.

Such problem is solved by means of an endoscope for the treatment pathologies of natural ducts of the human or animal body, e.g. an anoscope for lower rectum pathologies, for example for the minimally-invasive
25 surgical treatment of hemorrhoids in accordance with

claim 28.

Further characteristics and advantages of the device, clip, endoscope or anoscope and method according to the invention will be clearer from the below
5 description of preferred embodiments (referred to applications in the treatment of hemorrhoids, but not intended to be limited to such applications), given as indicative and not limiting with reference to the attached figures, wherein:

10 Figure 1 illustrates a perspective view of an embodiment of a device for the transanal treatment of hemorrhoids;

Figure 2 illustrates an enlarged detail of the device of figure 1;

15 Figure 3 illustrates an enlarged detail of a possible embodiment of the device of figure 1;

Figure 4 illustrates the detail of figure 3 from a different angle;

Figure 5 illustrates the detail of figure 3 from a
20 different angle and associated with an anoscope according to the present invention;

Figure 6 illustrates the detail and anoscope of figure 5 from a different angle;

Figure 7 illustrates a perspective view of an
25 anoscope according to the present invention;

Figure 8 illustrates a side view of the anoscope of figure 7;

Figure 9 illustrates a perspective view of the anoscope of figure 7;

5 Figure 10 illustrates a perspective and separated parts view of a possible embodiment of a clip according to the present invention;

Figure 11 illustrates a perspective view of a possible embodiment of a clip according to the present
10 invention in a first condition of use;

Figure 12 illustrates the clip of figure 11 in a second condition of use;

Figure 13 illustrates an enlarged view of a possible embodiment of a detail of the device of the present
15 invention;

Figure 14 illustrates a cross section of the anal canal;

Figure 15 illustrates a longitudinal section of the anal canal;

20 Figures 16-18 respectively illustrate a detail of figure 15 in a subsequent step of the method according to the invention.

With reference to the abovementioned figures, a device for the transanal treatment of hemorrhoids is
25 indicated in its entirety with 10.

Such device comprises a handle 12 and a shaft 14 which extends from the handle. A head 16 is arranged at the distal end of the shaft, i.e. at the end away from the surgeon or operator who holds and operates the device.

The head 16 comprises at least one jaw 18, movable between an open position, wherein it defines a window 20 for the insertion of the hemorrhoid and surrounding tissue, and a closed position.

According to the preferred embodiment illustrated in the drawings, the window 20 is open laterally, in the open position of the jaw 18.

A jaw opposing the movable jaw is indicated with 22. In the illustrated example, the opposing jaw is fixed and distal with respect to the movable jaw. In accordance with different embodiments, it is possible to foresee that both jaws are movable or else that the position of the movable jaw and opposing jaw is reversed, foreseeing the movable jaw in distal position with respect to the opposing jaw.

Advantageously, the shaft 14 may extend between the handle and the head in a curvilinear longitudinal direction.

Advantageously, the head, in particular the two jaws, has a curvilinear conformation.

In accordance with one embodiment of the invention, the device 10 is a linear or slightly curvilinear stapler. The head comprises at least one row 24 of clipping elements or staples which may be clasped to the
5 hemorrhoid and the surrounding tissue in order to clot the tissue and obtain hemostasis. Preferably the staples are clasped to the hemorrhoid after the head movement from the open to the closed position. In particular the handle comprises first means for closing the jaws and
10 second means for clasping the staples to the tissue. In a different embodiment, the staples are clasped to the tissue by means of the head movement from the open position to the closed position.

Preferably, at least two rows 24 of clipping
15 elements are foreseen, arranged substantially parallel to each other. Possibly, there may be foreseen more than two rows of clipping elements.

In the illustrated example, the clipping elements are arranged in the movable jaw 18. The opposing jaw
20 compels the clipping elements to bend and cling to the tissue, in passing from the head's open position to the closed position.

In accordance with a possible embodiment, a knife 26 is further foreseen adjacent to at least one row 24 of
25 clipping elements, for cutting the hemorrhoid and the

surrounding tissue. Preferably the knife is positioned adjacent to a row of staples suitable for being clasped to the tissue at the side of the anal duct. The knife is suitable for cutting the tissue at the side of the
5 hemorrhoid, without any row of staples on the hemorrhoid itself. Therefore the tissue of the anal duct is clotted obtaining hemostasis by means of the staples. In a different embodiment, in the case of two or more rows 24 of clipping elements, the knife may be arranged between
10 the two rows so that a first line of stapling belongs to the tissue which will be removed and a second line of stapling belongs to the tissue of the anal canal.

In accordance with a different embodiment, the device 10 comprises a head adapted to receive at least
15 one clip 28 and to tighten it on the hemorrhoid through the window. In other words, the head, which may be curvilinear, does not comprise multiple clipping elements or staples but is realized so to house one clip between the jaws.

20 Possibly, the head moreover comprises a knife 26 for cutting the hemorrhoid and the surrounding tissue compressed by the clip.

The clip 28 for the transanal treatment of hemorrhoids comprises two complementary elements 30, 32
25 adapted to be mutually locked in at least one compression

position of the hemorrhoid and adjacent tissue. Preferably, the clip 28 comprises two complementary curvilinear elements 30, 32 adapted to be housed in a head of a device for the transanal treatment of the
5 hemorrhoids as previously described.

In accordance with a first embodiment, the clip 28 comprises a first element 30 provided with at least one locking pin 34 adapted to be inserted in a corresponding seat 36 of the second element 32. The seat 36 comprises
10 at least one elastic element 38 and the locking pin 34 is shaped so to be snap-locked inside the seat 36.

Possibly, the first and second element 30, 32 respectively comprise guides 40 and sliding seats 42 for the mutual positioning of the two elements 28, 30.

15 Advantageously, the complementary elements 30, 32 comprise mutual compression portions 44 of the hemorrhoid and surrounding tissue. In accordance with a first embodiment, the compression portions are adapted to produce necrosis of the tissue, in the case wherein the
20 use of the knife 26 is not foreseen.

In accordance with a second embodiment, the complementary elements 30, 32 are mutually hinged and kept closed by means of at least one elastic element 46, preferably arranged at the hinge 48. During insertion,
25 the complementary elements 30, 32 are kept open by means

of the jaws of the head.

Also in this case, mutual compression portions 44 are also foreseen serving as snap-clasping portions in order to close on the hemorrhoid and on the surrounding
5 tissue.

Advantageously, both described and illustrated examples foresee complementary elements 30, 32 wherein at least one portion is realized in biocompatible material. Preferably, the portion in biocompatible material is
10 arranged at the clasping or connection zone between the two complementary elements (pin or hinge in relation with the type of clip).

In accordance with an additional embodiment, the present invention relates to a device 10 for the
15 transanal treatment of hemorrhoids comprising a handle 12, a shaft 14 which extends from the handle 12 and a head 16 arranged at the distal end of the shaft. The head 16 comprises at least one jaw 18, movable between an open position, wherein it defines a window 20 for the
20 insertion of the hemorrhoid and surrounding tissue, and a closed position. In particular, the head is realized as previously described, i.e. it comprises a jaw 22 opposing the movable jaw. In the illustrated example, the opposing jaw is fixed and distal with respect to the movable jaw.
25 Also in this case, it is possible to foresee that both

jaws are movable or else that the position of the movable jaw and opposing jaw is reversed, foreseeing the movable jaw in distal position with respect to the opposing jaw.

According to this embodiment, the head does not
5 foresee the presence of clipping elements. Indeed, the shaft and the head advantageously comprise means 50 for applying energy to the hemorrhoid and to the surrounding tissue in order to cut and clot the tissue. In accordance with this embodiment, the shaft may extend between the
10 handle and the head in a curvilinear longitudinal direction. Moreover, the head, in particular the jaws, may have a curvilinear conformation.

In accordance with a first embodiment, the means for applying energy comprise ultrasound means. Alternatively,
15 the means for applying energy comprise laser means.

According to an additional feature, the present invention relates to a method for the transanal treatment of hemorrhoids.

In general terms such method comprises the steps of:
20 positioning a device 10 for the transanal treatment of the hemorrhoids according to one of the previously described embodiments, locally placing the head 16 on the single hemorrhoid;

grasping and pulling the hemorrhoid through the
25 window 20 defined by the head 16 of the device for the

transanal treatment of hemorrhoids,

closing the jaws 18, 22, locking the hemorrhoid and surrounding tissue,

uniting the tissue portions at the zone wherein the
5 tissue is locked between the jaws.

Moreover, the step of cutting the tissue through the jaws and removing the tissue from the site may be advantageously foreseen.

In accordance with a possible embodiment, the tissue
10 portions are united at the zone wherein the tissue is locked between the jaws by means of at least one row of clipping elements or staples. The staples are preferably clasped to the tissue after the movement of the jaws from the open to the closed position.

15 In accordance with a different embodiment, the tissue portions are united at the zone wherein the tissue is locked between the jaws by means of the positioning of one clip, as previously described.

In accordance with a further embodiment, the tissue
20 portions are united at the zone wherein the tissue is locked between the jaws by means of the application of energy, preferably ultrasound or laser, with the simultaneous cutting of the tissue.

Below, the steps of a method for the transanal
25 treatment of hemorrhoids according the present invention

are described in detail.

The patient is prepared and positioned for operation, possibly in conventional manner or according to the surgeon's preferences. A conventional preparation
5 of the operating area is also carried out and one proceeds with the anesthesia, for example spinal or general.

A visual examination is carried out of the anal canal and perianal tissue with subsequent digital rectal
10 examination for identifying and classifying the internal hemorrhoids and possibly examining and taking note of additional pathologies.

An anoscope is then inserted.

The internal hemorrhoid is grasped for example by
15 means of forceps, locating an unaffected zone on the patient.

The device for the transanal treatment of hemorrhoids is then inserted and the hemorrhoid is pulled through the window of the device itself. The jaws are
20 then closed, thus locking the hemorrhoid and surrounding tissue.

In the case wherein the device is a stapler, as previously described, preferably after closing the jaws, the clipping elements are inserted and closed through the
25 tissue and the knife is operated to cut the hemorrhoid.

The excised tissue is removed. Preferably the staples are clasped to the tissue of the anal duct in order to clot at least this portion of tissue.

In the case wherein one clip is used, as previously
5 described, the clip is previously positioned at the open window and the tissue is pulled through the window and the open clip. The jaws' closing causes the locking of the clip on the hemorrhoid. In this case, it may be foreseen that the device also comprises a knife, and that
10 therefore the tissue compressed by the clip is cut and removed. Alternatively, the tissue is not cut; it comes off due to the necrosis of the compressed zone. In the case of use of biocompatible material portions, the clip comes off or is absorbed once its task has been
15 completed.

Finally, in the case of means for applying energy, after the closure of the jaws, such means (laser or ultrasound) are operated for cauterizing and cutting the tissue.

20 The device is then removed, possibly with the excised tissue.

Subsequently, the hemostasis is checked at the point of the cut and the anorectal junction. If the examination is satisfactory, it is possible to remove the anoscope.

25 Finally, a sponge is inserted in the rectum.

According to a further aspect, the present invention relates to an anoscope for the treatment of lower rectum pathologies, for example for the treatment of hemorrhoids, in particular as previously described.

5 An anoscope according to the present invention is indicated with 52, comprising an insertion portion 54 and an external or grip portion 56.

The insertion portion comprises a substantially tubular wall which extends from a proximal section 54a to
10 a distal section 54b. The distal section is advantageously realized in frustoconical shape, with smaller section at the distal end of the anoscope.

Moreover, the tubular wall comprises a window 58, for example adapted to visualize the hemorrhoids and to
15 permit the use of the above-described instruments. In particular, the window 58 involves a central section 54c and the distal section 54b of the insertion portion, opening on the distal end of the anoscope. Advantageously, the window 58 does not extend to the
20 proximal section 54a of the insertion portion. In other words, the proximal section 54a extends with continuity in the circumferential direction, over 360°, in order to protect the anorectal junction during the procedure.

In accordance with a possible embodiment, the window
25 58 has a curvilinear edge, at least in the central

section 54c of the insertion portion, and it widens slightly moving from the proximal to the distal section of the anoscope, at least until the beginning of the distal section.

5 Advantageously, in accordance with a possible embodiment, the insertion portion has a variable diameter from the proximal to the distal section, at least until the beginning of the distal section. In particular, a transverse size d2 (diameter) measured at the beginning
10 of the proximal section is smaller than a transverse size d1 (diameter) measured at the beginning of the distal section (the term "beginning" was used in reference to moving from the proximal to the distal section of the anoscope).

15 The passage from the size d1 to the size d2 may be obtained by means of a curvilinear profile or more preferably a linear profile.

 Preferably, the anoscope is realized in transparent material, so to have the anorectal junction constantly
20 under observation.

 Regarding the grip portion 56, at least two flanges
60 are advantageously foreseen which extend transversely with respect to the longitudinal extension of the insertion portion, so to permit the manipulation and
25 possibly the rotation of the anoscope around the

circumference of the anal/rectal wall. Advantageously, two diametrically opposed and slightly offset flanges are foreseen on one side of the anoscope.

The size of the anoscope, and in particular the size
5 of the insertion portion, is such to permit the use of instruments such as those described above, and to avoid damaging the sphincter muscles.

With reference to the use of an anoscope, and in particular the above-described anoscope, the aforesaid
10 method for the transanal treatment of hemorrhoids in particular foresees the steps of:

preparing the patient and the operating area;

proceeding to the anesthesia, for example spinal or general;

15 carrying out a visual examination of the anal canal and perianal tissue with subsequent digital rectal examination for identifying and classifying the internal hemorrhoids;

inserting an anoscope, in particular an anoscope as
20 previously described;

positioning the window 58 at the hemorrhoid and grasping the hemorrhoid through the window by inserting grasping means 62 through the anoscope and window;

preferably locating an unaffected zone on the
25 patient;

inserting inside the anoscope a device for the transanal treatment of hemorrhoids, in particular as previously described, making the head 16 project through the window 58;

5 pulling the hemorrhoid through the anoscope window and through the device window;

closing the jaws, thus locking the hemorrhoid and surrounding tissue.

In the case wherein the device is a stapler, as
10 previously described, the clipping elements or staples are inserted and closed through the tissue and the knife is operated to cut the hemorrhoid preferably after the movement of the head from the open to the closed position. The excised tissue is removed by extracting it
15 from the anoscope.

In the case wherein one clip is used, as previously described, the clip is previously positioned at the open window and the tissue is pulled through the anoscope window, device window and through the open clip. The
20 jaws' closing causes the locking of the clip on the hemorrhoid. In this case, it may be foreseen that the device also comprises a knife, and that therefore the tissue compressed by the clip is cut and removed through the anoscope. Alternatively, the tissue is not cut; it
25 comes off due to the necrosis of the compressed zone. In

the case of use of biocompatible material portions, the clip comes off or is absorbed once its task has been completed.

Finally, in the case of means for applying energy,
5 after the closure of the jaws, such means (laser or ultrasound) are operated for cauterizing and cutting the tissue.

The device is then removed, possibly with the excised tissue, and the anoscope is also subsequently
10 removed. Possible, a sponge is inserted in the rectum.

From the above, it may be appreciated how foreseeing a method according to the present invention permits obtaining a more radical result, without producing a large wound over the entire circumference of the anal
15 canal.

The device, clip and anoscope described above permit simplifying procedures, reducing the patient risks. Moreover, they permit the elimination of every single hemorrhoid, possibly operating in several subsequent
20 steps in order to avoid creating excessive discomfort for the patient.

The stapling line or the clip is adapted to be correctly positioned. By means of the hemorrhoid traction, they may be moreover more deeply positioned
25 with respect to the use of the elastic band. Moreover,

their position is ensured, is stable over the course of the procedure or post-operative course.

Clearly, variations and/or additions to that described and illustrated above may be foreseen.

5 For example, the aforesaid device may extend in a curvilinear longitudinal direction comprising one or more curved portions.

Regarding the preferred embodiment of the device, clip, method or anoscope described above in relation with
10 the treatment of hemorrhoids, but suitable in general for a intraluminal treatment of body tissue, e.g. also for the treatment of body tissue different from hemorrhoids, a person skilled in the art, in order to satisfy contingent and specific needs, may produce numerous
15 modifications, adaptations and substitutions of elements with other functionally equivalent elements without however leaving the scope of the following claims.

*** * ***

CLAIMS

1. Device for the intraluminal treatment of body tissue, comprising a handle, a shaft which extends from said handle and a head arranged at the distal end of the shaft, wherein said head comprises at least one jaw, movable between an open position, wherein it defines a window for the insertion of the tissue to be treated, and a closed position, and wherein said shaft extends between the handle and head in a curvilinear longitudinal direction.

2. Device according to claim 1, wherein said head has a curvilinear conformation.

3. Device according to claim 1, wherein said device is a linear or slightly curvilinear stapler and wherein said head comprises at least one row of clipping elements or staples which may be clasped to the tissue to be treated and to the surrounding tissue in order to clot the tissue and obtain hemostasis.

4. Device according to claim 3, further comprising a knife, adjacent to the at least one row of clipping elements or staples, for cutting the tissue to be treated and the surrounding tissue at the side of the tissue, the tissue of the natural duct being clotted by the row of staples obtaining hemostasis.

5. Device according to claim 1, wherein said head

is adapted to receive at least one clip and to tighten it on the tissue to be treated through said window.

6. Device according to claim 5, wherein said head moreover comprises a knife for cutting the tissue to be treated and the surrounding tissue compressed by said clip.

7. Clip for the intraluminal treatment of body tissue comprising two complementary elements adapted to be mutually locked in at least one compression position of the tissue to be treated and adjacent tissue.

8. Clip according to claim 7, comprising two curvilinear complementary elements adapted to be housed in a head of a device for the intraluminal treatment of tissue according to one of the claims from 1 to 6.

9. Clip according to claim 7, wherein a first element comprises at least one locking pin adapted to be inserted in a corresponding seat of the second element, said seat comprising at least one elastic element and said pin being shaped so to be snap-locked inside said seat.

10. Clip according to claim 9, wherein said first and second element comprise respective guides and sliding seats for the mutual positioning of the two elements.

11. Clip according to claim 7, wherein said complementary elements comprise mutual compression

portions of the tissue to be treated and surrounding tissue.

12. Clip according to claim 7, wherein said complementary elements are mutually hinged and kept
5 closed by means of at least one elastic element, preferably arranged at the hinge.

13. Clip according to claim 12, wherein said complementary elements comprise mutual compression and snap-clasping portions in order to close on the tissue to
10 be treated and on the surrounding tissue.

14. Clip according to claim 7, wherein at least one portion of said complementary elements is realized in bioabsorbable material.

15. Clip according to claim 14, wherein said bioabsorbable material portion is arranged at the clasping or connection zone between the two complementary elements.

16. Device for the intraluminal treatment of body tissue comprising a handle, a shaft which extends from
20 said handle and a head arranged at the distal end of the shaft, wherein said head comprises at least one jaw, movable between an open position, wherein it defines a window for the insertion of the tissue to be treated and surrounding tissue, and a closed position, and wherein
25 said shaft and said head comprise means for applying

energy to the tissue to be treated and surrounding tissue in order to cut and clot the tissue.

17. Device according to claim 16, wherein said shaft extends between the handle and the head in a
5 curvilinear longitudinal direction.

18. Device according to claim 16, wherein said head has a curvilinear conformation.

19. Device according to claim 16, wherein said means for applying energy comprise ultrasound means.

10 20. Device according to claim 16, wherein said means for applying energy comprise laser means.

21. Method for the intraluminal treatment of body tissue comprising the steps of:

positioning a device according to one of the claims
15 1-6 or 16-20 at the tissue to be treated, locally placing the head on the single tissue;

grasping and pulling the tissue through the window defined by the head of the device,

closing the jaws, locking the tissue and surrounding
20 tissue,

uniting the tissue portions at the zone wherein the tissue is locked between the jaws.

22. Method according to claim 21, moreover comprising the step of cutting the tissue through the
25 jaws and removing it from the site.

23. Method according to claim 21, wherein the tissue portions are joined at the zone wherein the tissue is locked between the jaws by means of at least one row of clipping elements or staples.

5 24. Method according to claim 23, wherein the staples are clasped to the tissue to be treated after the head movement from an open-position to a closed position.

25. Method according to claim 24, wherein the tissue is cut through the jaws when the staples are
10 clasped to the tissue to be treated

26. Method according to claim 21, wherein the tissue portions are united at the zone wherein the tissue is locked between the jaws by means of positioning one clip according to one of the claims from 7 to 15.

15 27. Method according to claim 21, wherein the tissue portions are united at the zone wherein the tissue is locked between the jaws by means of applying energy, preferably ultrasound or laser, with the simultaneous cutting and clotting of the tissue.

20 28. Endoscopio (52) for the treatment of pathologies of the natural ducts of the human or animal body, in particular for the transanal treatment of hemorrhoids, comprising an insertion portion (54) and an external or grip portion (56), wherein the insertion
25 portion comprises a substantially tubular wall which

extends from a proximal section (54a) to a distal section (54b), said distal section being realized in frustoconical shape, with smaller section at the distal end of the anoscope.

5 29. Endoscope according to claim 28, wherein said tubular wall comprises a window (58), for example adapted to visualize the tissue to be treated and to permit the use of instruments.

10 30. Endoscope according to claim 29, wherein the window (58) involves a central section (54c) and the distal section (54b) of the insertion portion, opening on the distal end of the endoscope.

15 31. Endoscope according to claim 30, wherein the window (58) does not extend to the proximal section (54a) of the insertion portion.

32. Endoscope according to claim 30, wherein the proximal section (54a) extends with continuity in the circumferential direction, over 360°.

20 33. Endoscope according to claim 29, wherein the window (58) has a curvilinear edge, at least in the central section (54c) of the insertion portion, and it widens slightly moving from the proximal to the distal section of the Endoscope, at least until the beginning of the distal section.

25 34. Endoscope according to claim 29, wherein the

insertion portion has a variable diameter from the proximal to the distal section, at least until the beginning of the distal section.

35. Endoscope according to claim 34, wherein a
5 transverse size (d2) measured at the beginning of the proximal section is smaller than a transverse size (d1) measured at the beginning of the distal section, moving from the proximal to the distal section of the endoscope.

36. Endoscope according to claim 35, wherein the
10 passage from the size (d1) measured at the beginning of the distal section to the size (d2) measured at the beginning of the proximal section is obtained by means of a curvilinear profile.

37. Endoscope according to claim 35, wherein the
15 passage from the size (d1) measured at the beginning of the distal section to the size (d2) measured at the beginning of the proximal section is obtained by means of a linear profile.

38. Endoscope according to claim 28, realized in
20 transparent material.

39. Endoscope according to claim 28, wherein the
grip portion (56) comprises at least two flanges (60)
which extend transversely with respect to the
longitudinal extension of the insertion portion, so to
25 permit the manipulation and possibly the rotation of the

endoscope around the circumference of the natural duct wall.

40. Endoscope according to claim 39, wherein two diametrically opposed and slightly offset flanges are provided on one side of the endoscope.

41. Endoscope according to claim 28, wherein the size of the endoscope, and in particular the size of the insertion portion, is such to permit the use of instruments and to avoid damaging the muscles around the duct (e.g. the sphincter muscles).

42. Method for the intraluminal treatment of body tissue, comprising the following steps:

positioning and preparing the patient and the operating area,

proceeding to anesthesia, for example spinal or general,

visually/digitally examining the natural duct and the tissue to be treated,

inserting an endoscope, for example according to one of the claims from 28 to 41, comprising a window (58),

inserting grasping means (62) or forceps in the endoscope and grasping the tissue to be treated through said window (58), preferably locating an insensible zone on the patient,

inserting in the endoscope a device for the

intraluminal treatment of body tissue, for example according to one of the claims 1-6 or 16-20,

pulling the tissue to be treated through the endoscope window (58) and through a device window (20);

5 closing the jaws (18, 22) of the device, thus locking the tissue and surrounding tissue.

43. Method according to claim 42, wherein the device is a stapler.

44. Method according to claim 43, wherein the
10 insertion of clipping elements or staples through the tissue is performed after the closing of the jaws.

45. Method according to claim 44, wherein the operation of a knife for cutting the tissue is performed during the insertion of clipping elements or staples
15 through the tissue, the tissue being cut adjacent to at least a row of staples inserted in the natural duct so to remove the excised tissue.

46. Method according to claim 42, wherein said device bears a previously positioned clip at an open
20 window of the device and the tissue is pulled through the window of the endoscope, the window of the device and the open clip, the jaws' closing causing the locking of the clip on the tissue.

47. Method according to claim 46, wherein the
25 device also comprises a knife, and the tissue compressed

by the clip is cut and removed.

48. Method according to claim 46, wherein the tissue is not cut; it comes off due to the necrosis of the compressed zone.

5 49. Method according to claim 42, wherein after the jaw's closing, means are operated for applying energy (for example laser or ultrasound) for cauterizing and cutting the tissue.

10 50. Method according to claim 42, wherein the device and endoscope are removed upon completion of the method.

51. Method according to claim 50, wherein after the removal of the device and endoscope, a sponge is inserted into the natural duct.

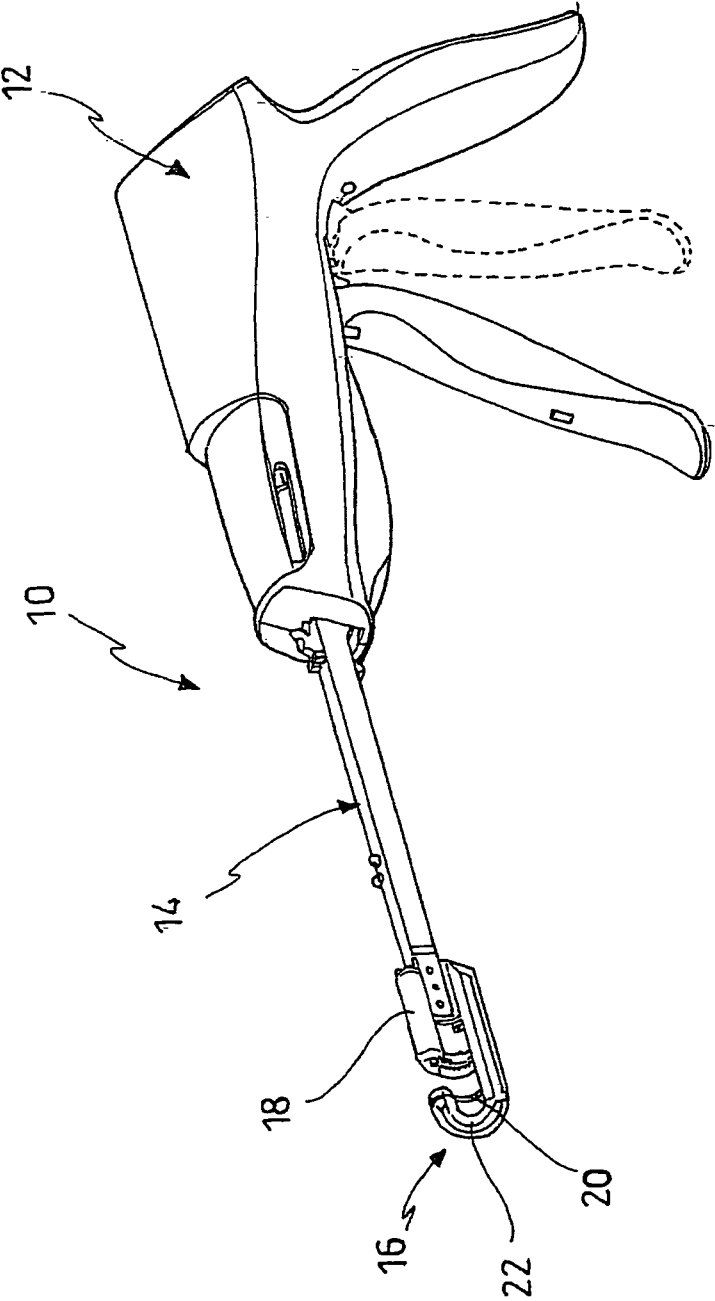
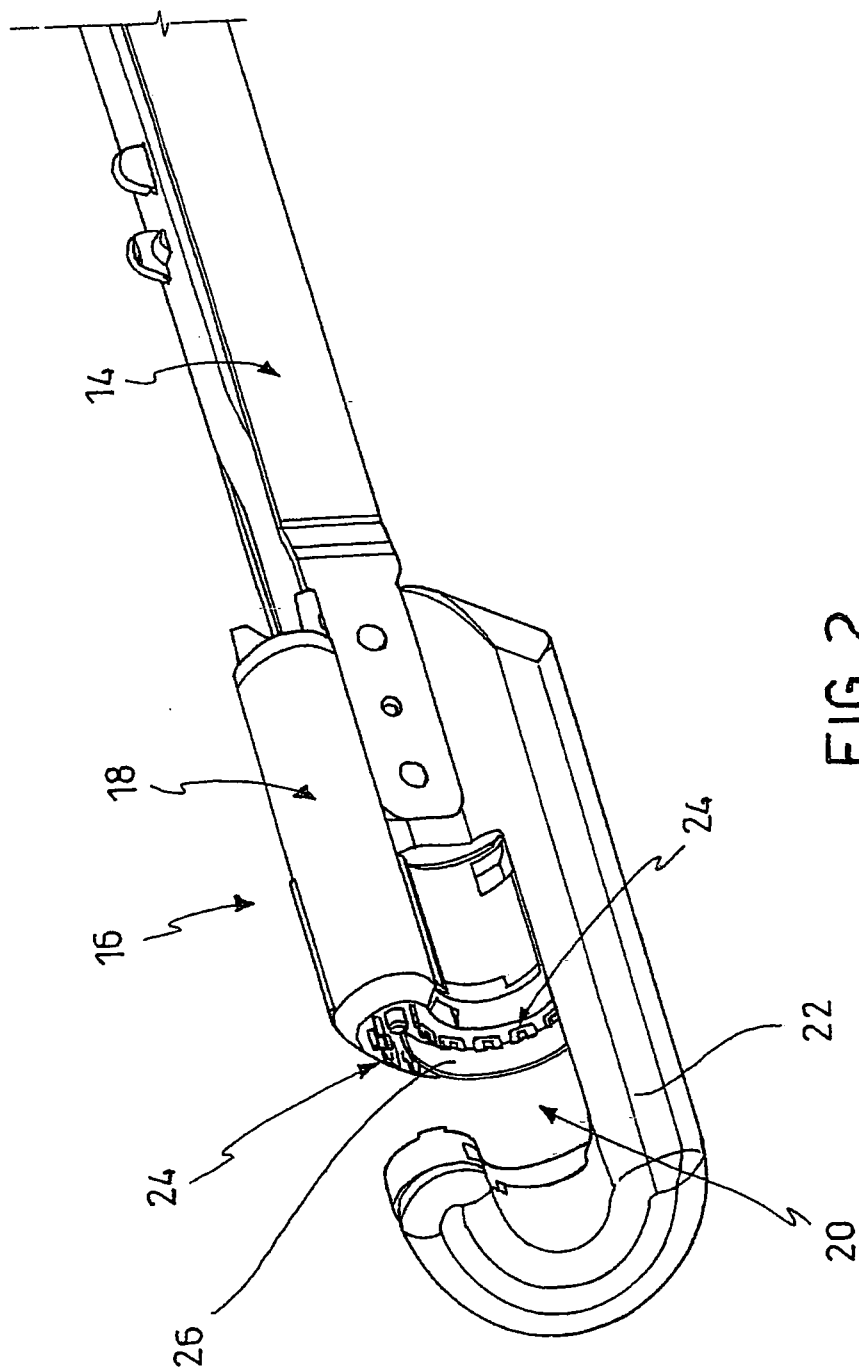


FIG. 1



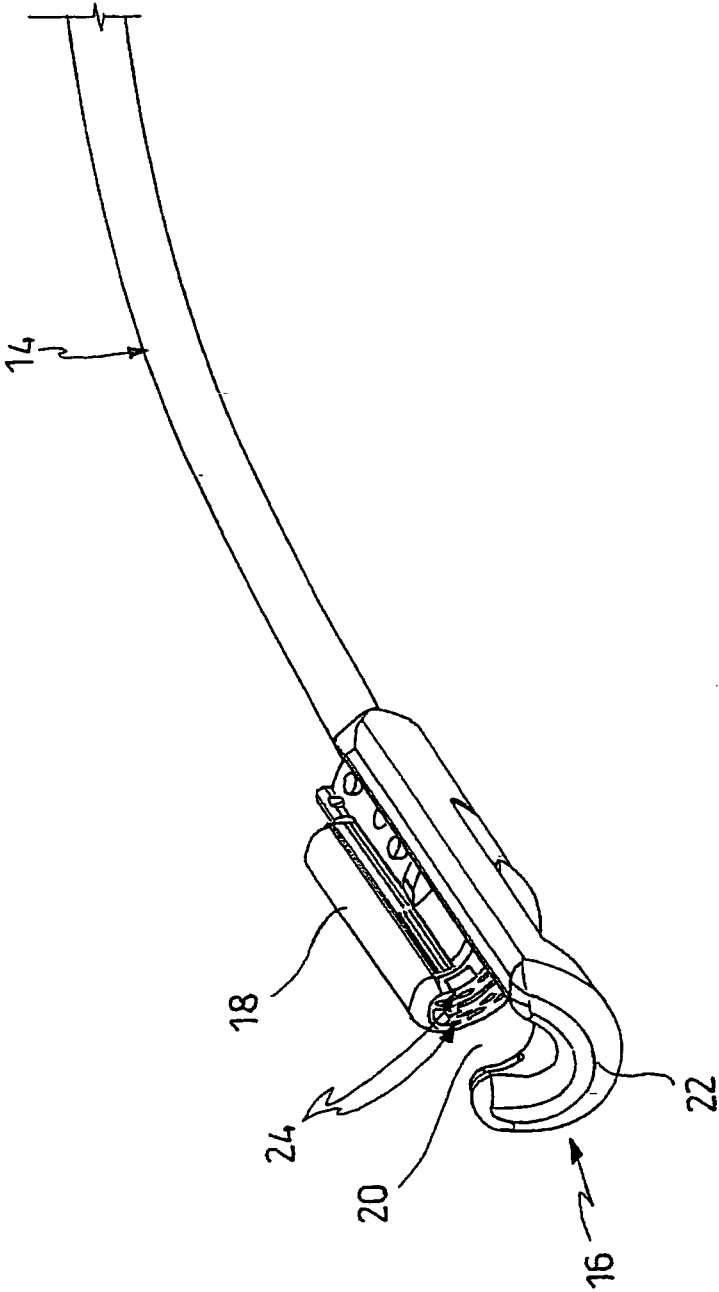


FIG. 3

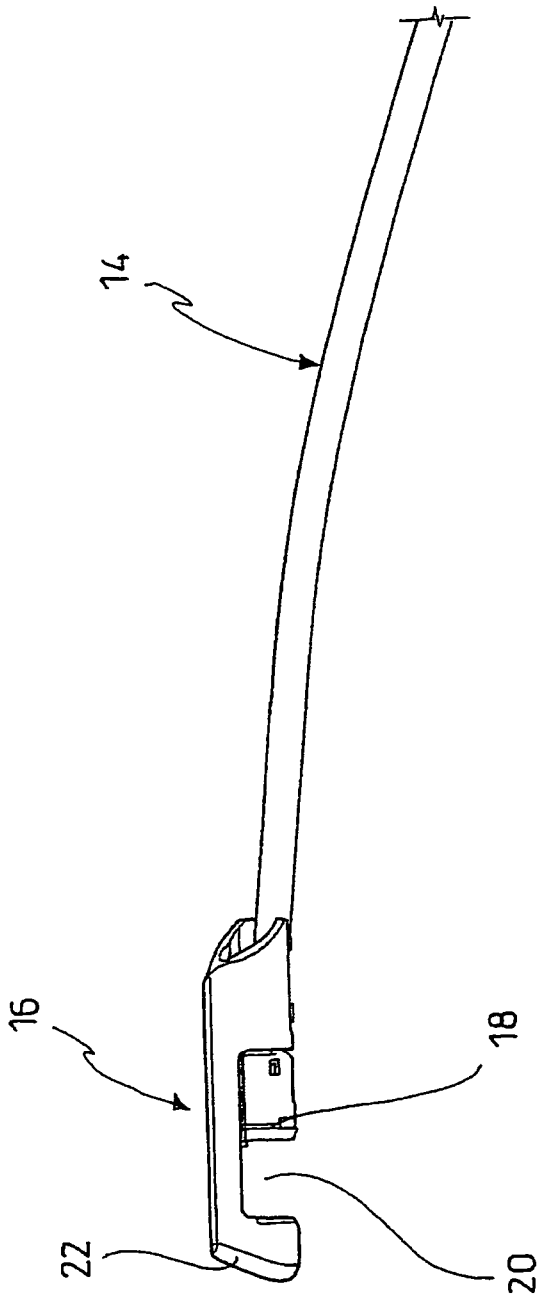


FIG. 4

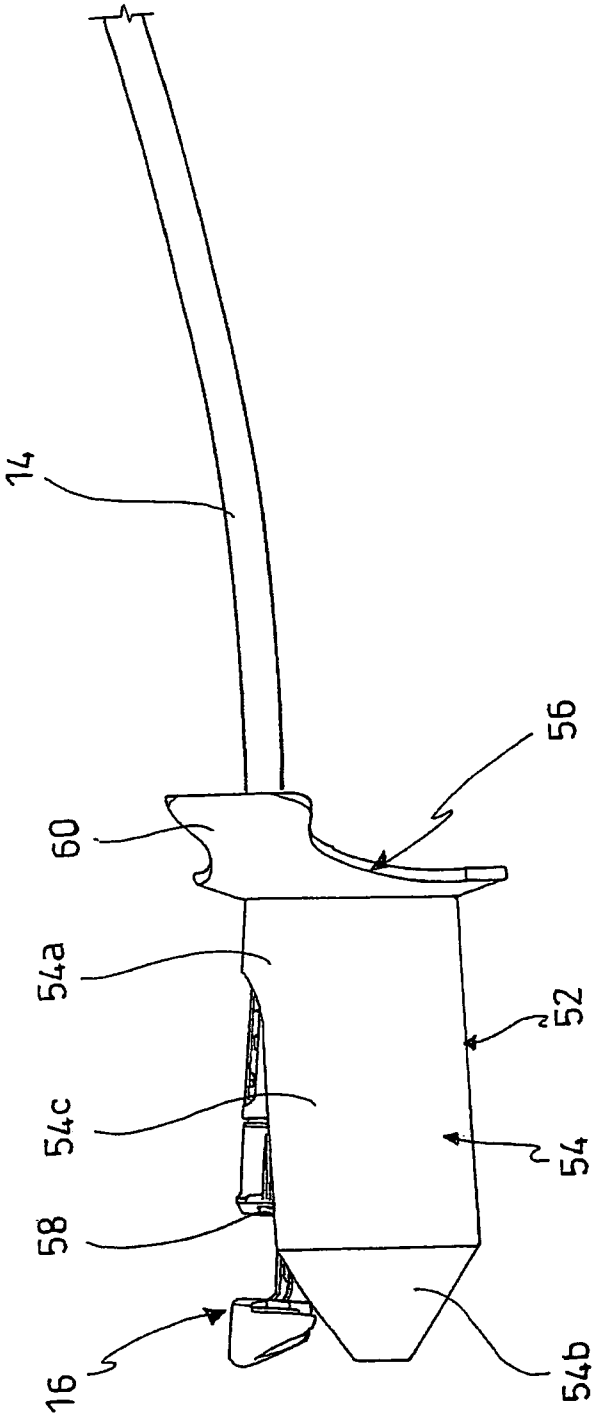


FIG. 5

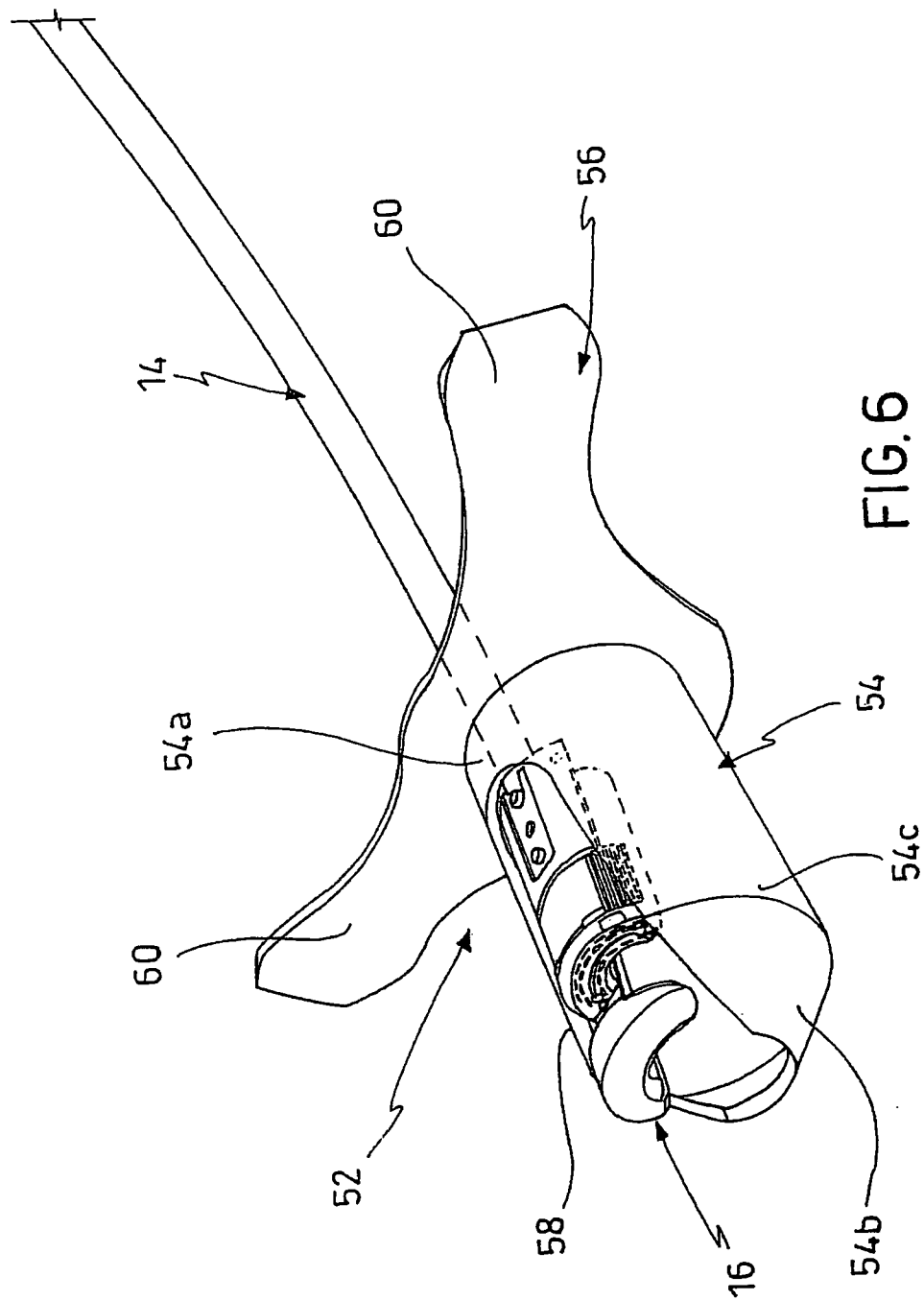


FIG. 6

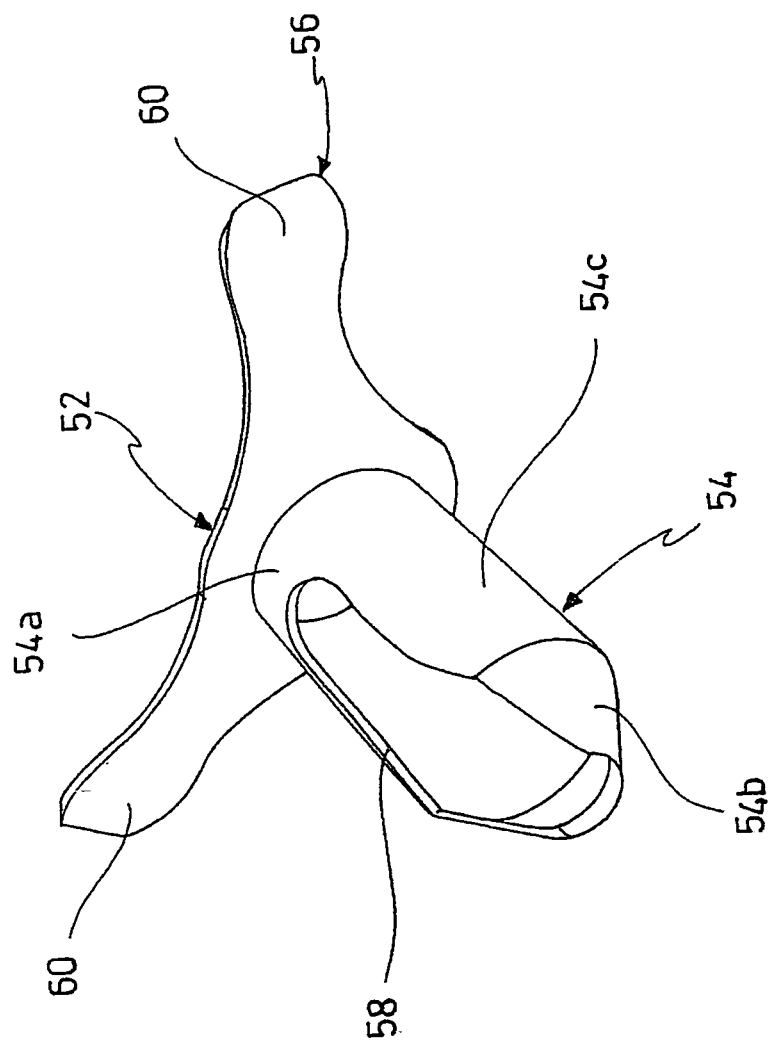


FIG. 7

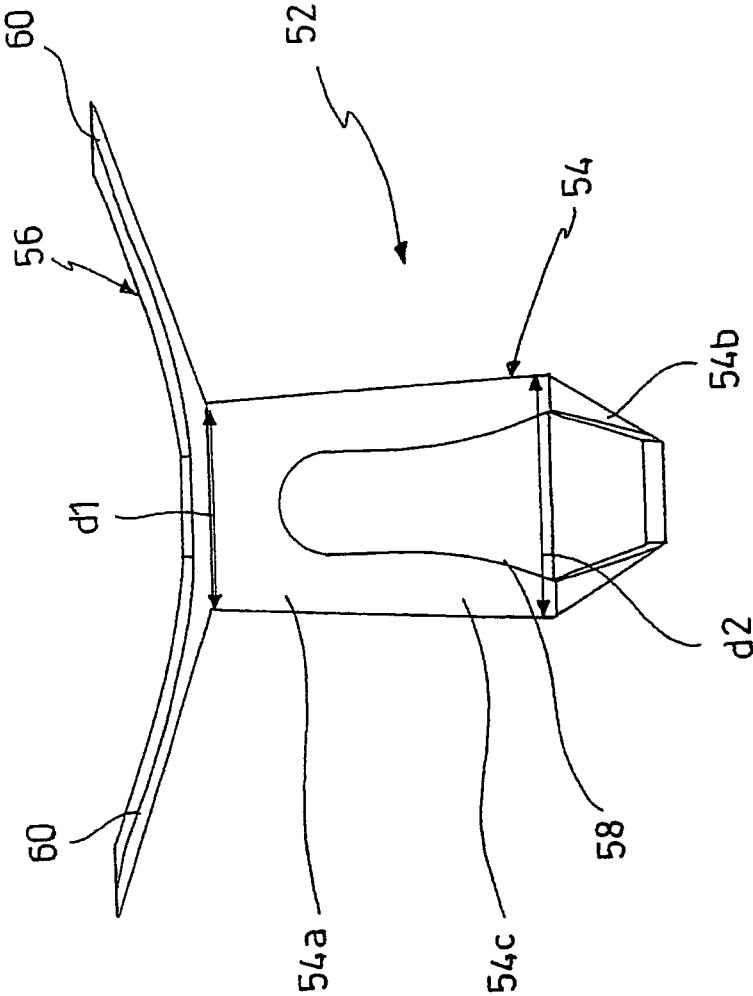


FIG. 8

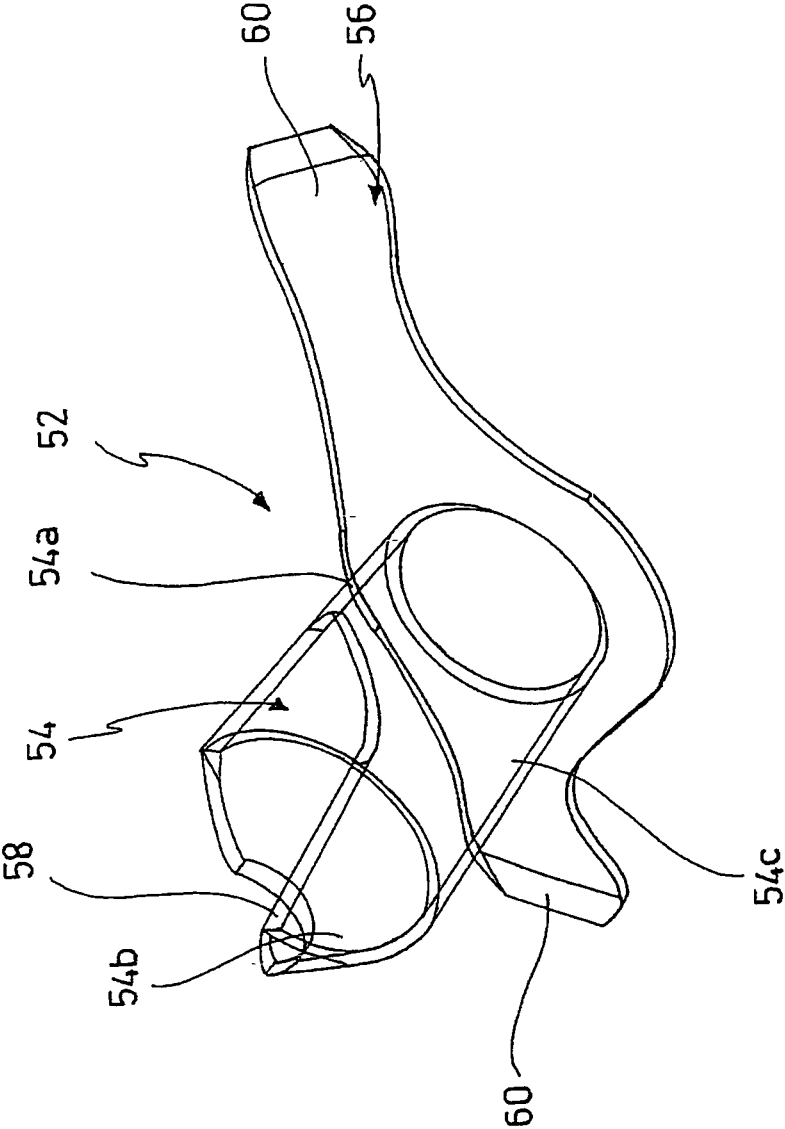
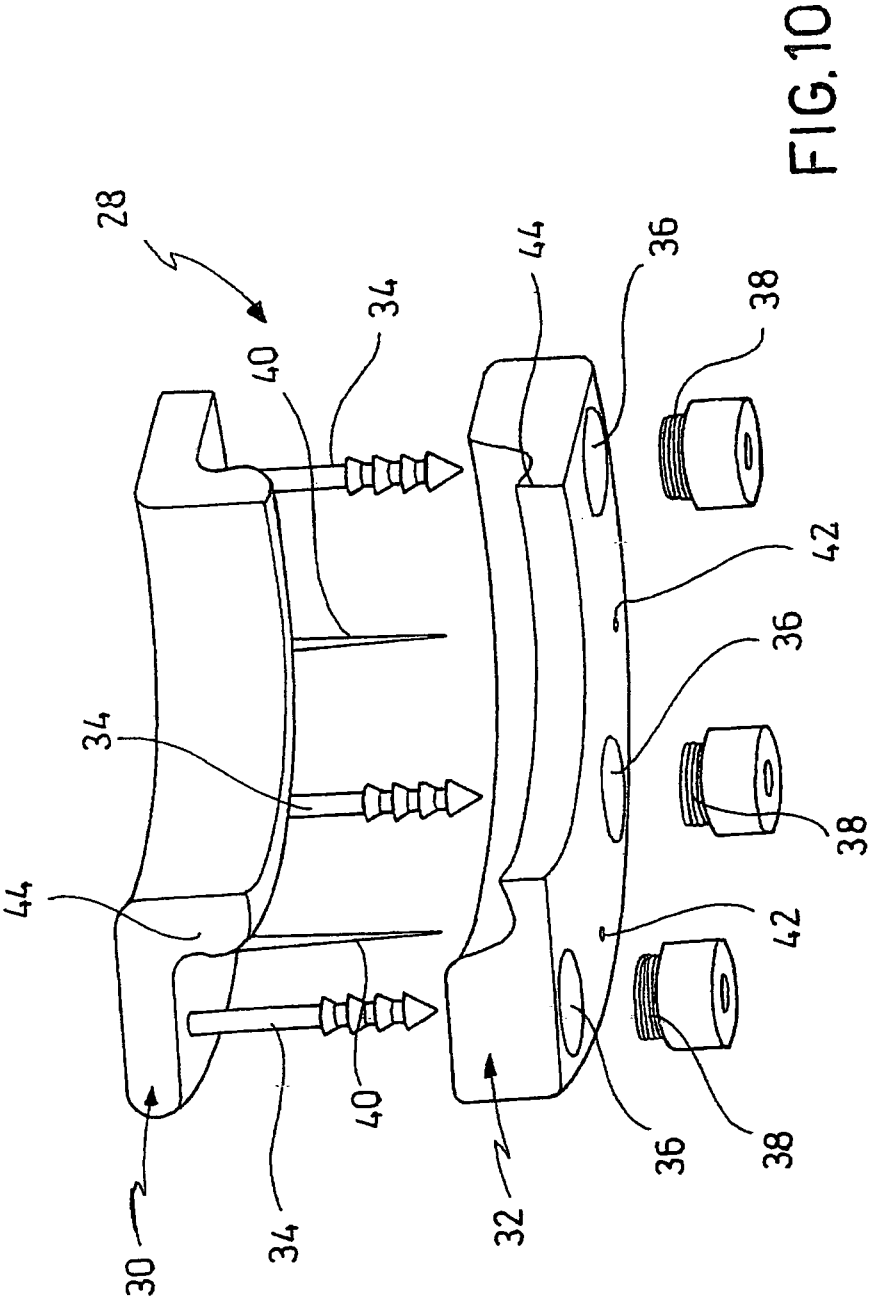


FIG. 9



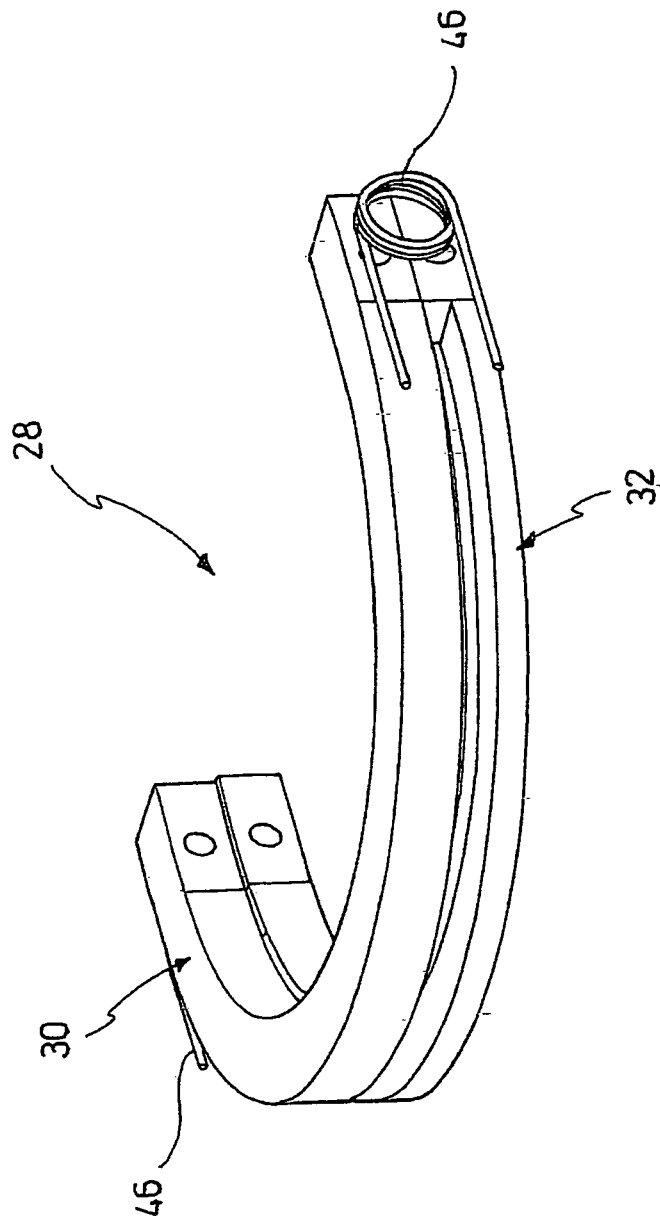


FIG.11

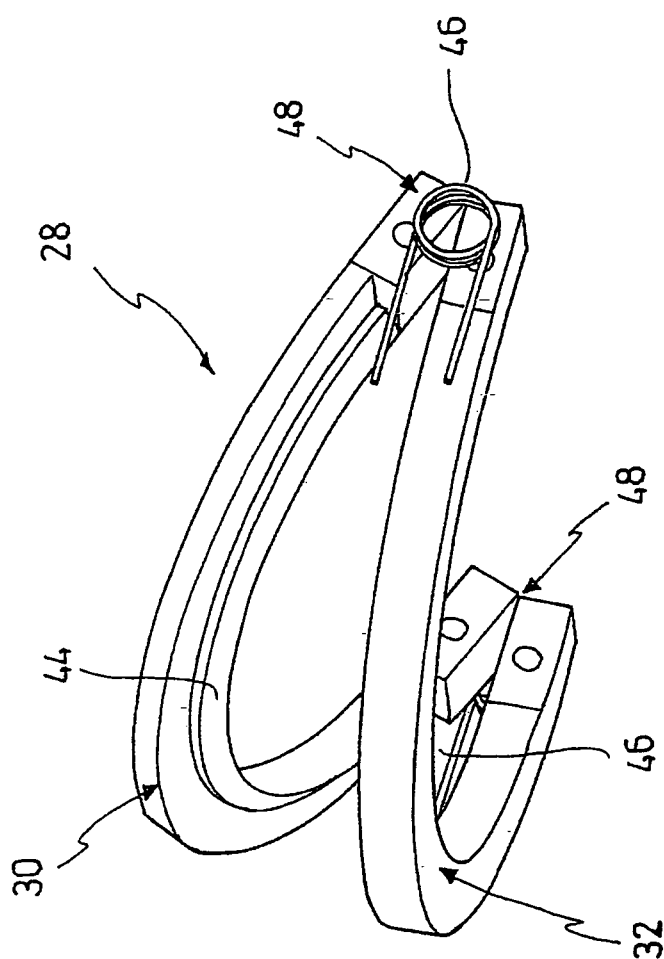


FIG. 12

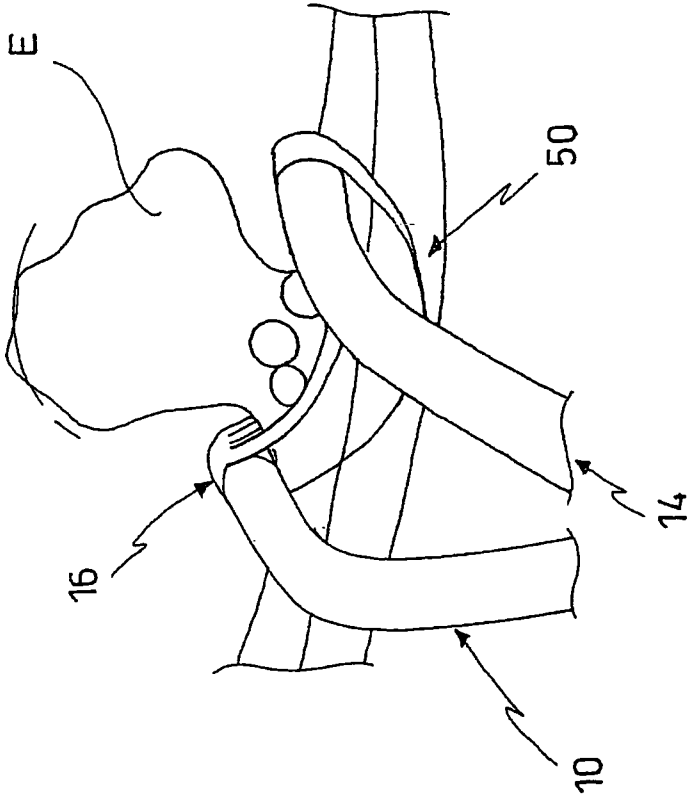


FIG.13

14/18

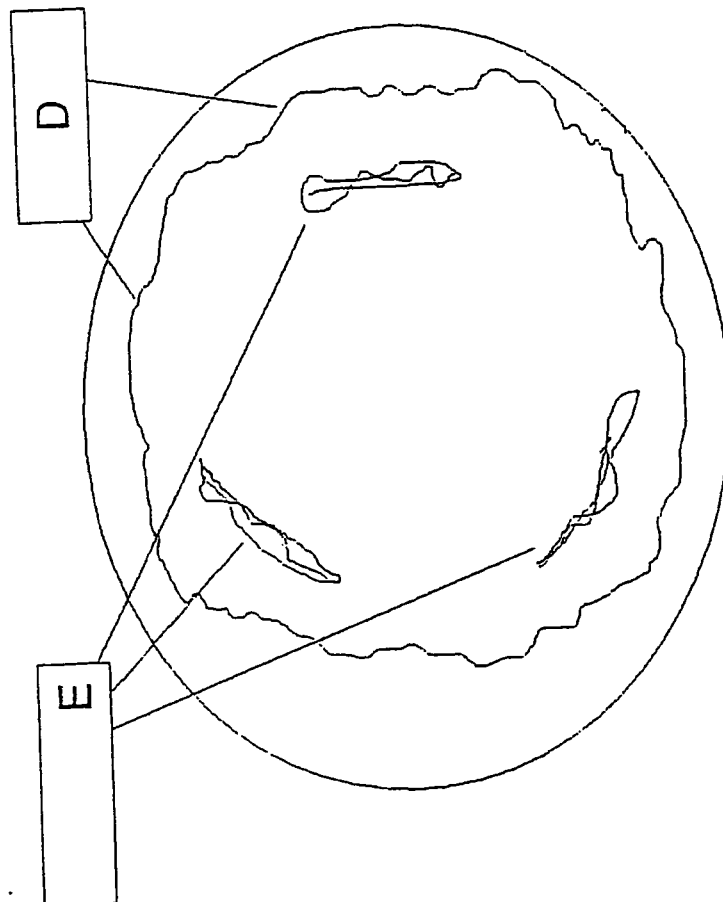


FIG.14

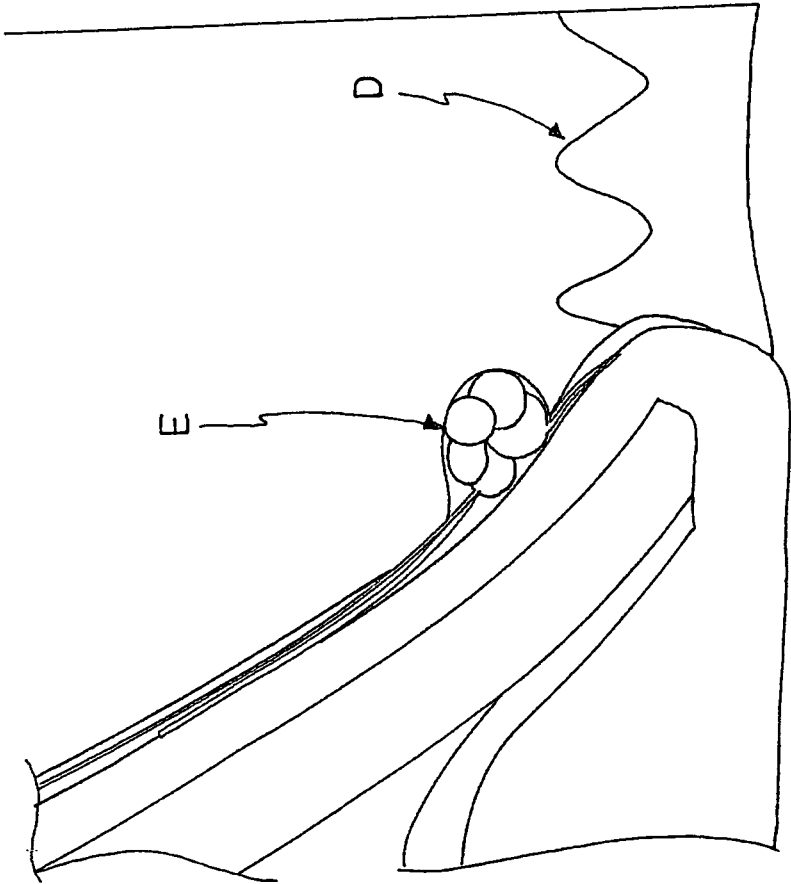


FIG.15

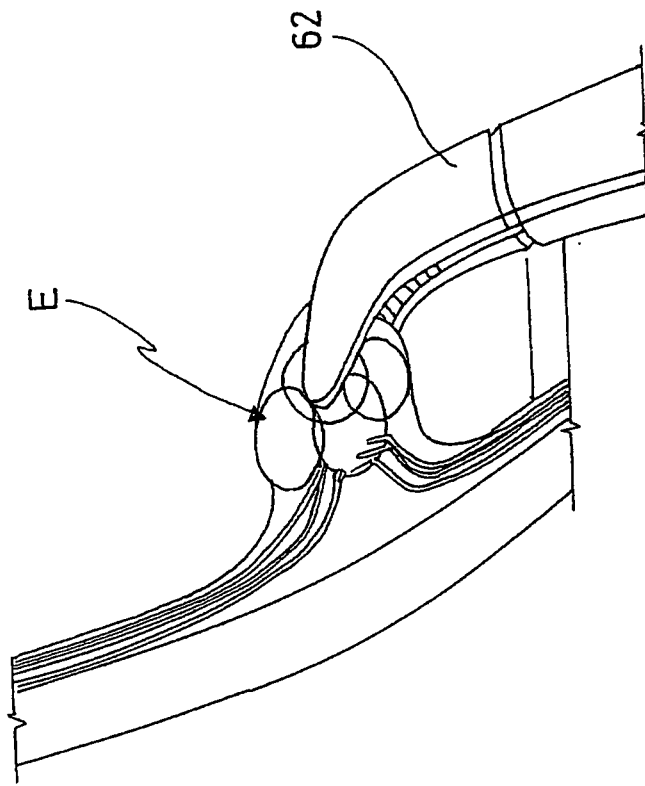


FIG.16

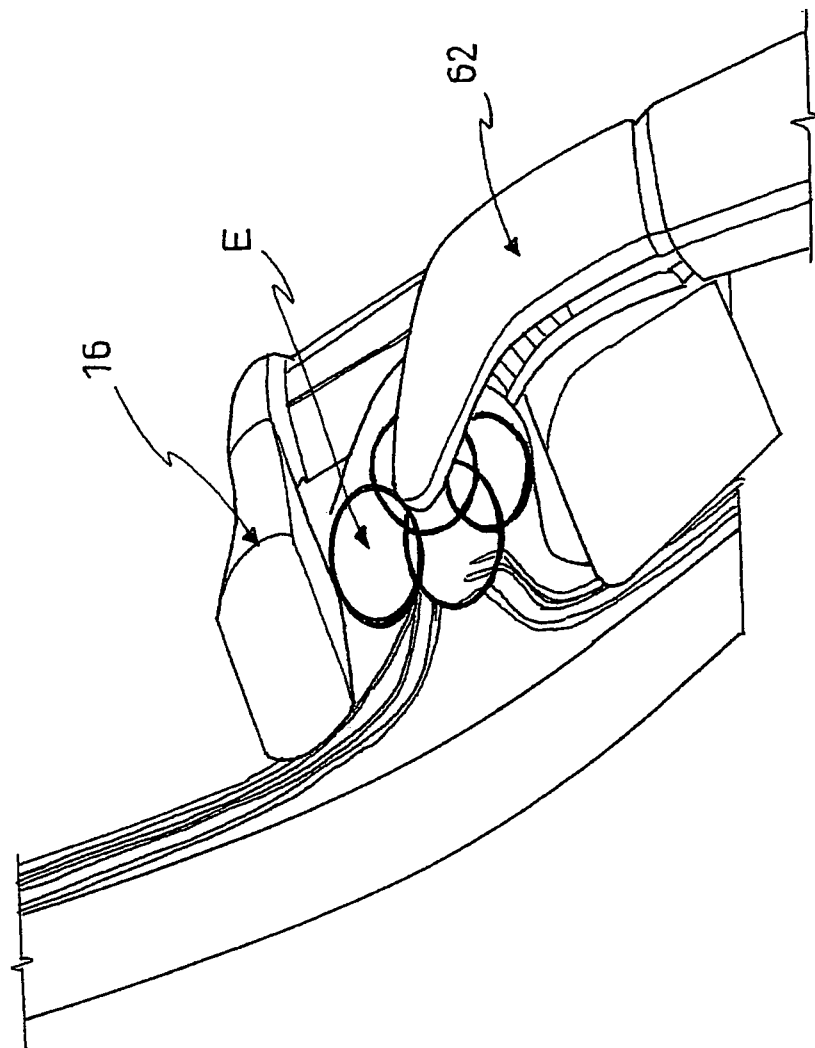


FIG.17

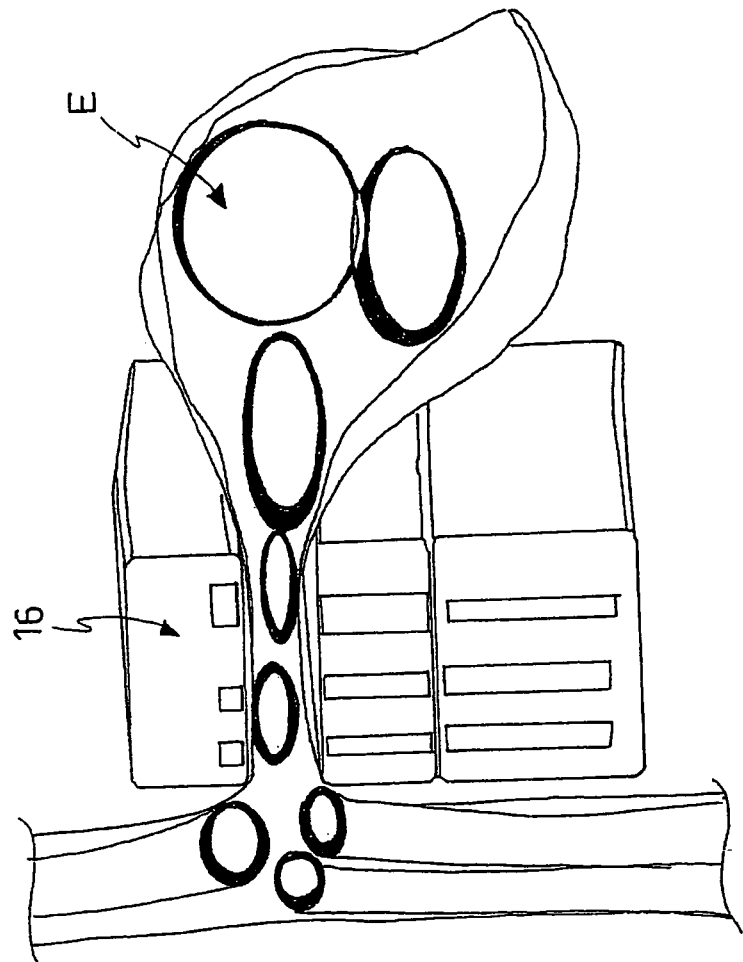


FIG.18

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2006/007355

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B17/064 A61B17/072 A61B17/068 A61B17/128 A61B17/122
A61B1/31

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)

A61B

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

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

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/91646 A (ETHICON ENDO-SURGERY GMBH; BILOTTI, FEDERICO; LONGO, ANTONIO) 6 December 2001 (2001-12-06)	1-6
Y	page 1, line 21 - page 16, line 27 figures	8
X	US 5 156 315 A (GREEN ET AL) 20 October 1992 (1992-10-20)	7,10,11
Y	column 6, line 36 - column 8, line 53 column 11, line 15 - column 13, line 38 figures 1-5,18,19A-23	8
X	US 4 513 746 A (ARANYI ET AL) 30 April 1985 (1985-04-30)	7,9-11
Y	column 4, line 33 - column 14, line 39 figures 1,14-29	8
	----- -/--	



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 document 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)

"C" 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

18 September 2006

Date of mailing of the international search report

04/01/2007

Name and mailing address of the ISA/

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Authorized officer

Compos, Fabien

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/007355

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 136 949 A (UNITED STATES SURGICAL CORPORATION) 10 April 1985 (1985-04-10)	7,9-11
Y	page 4, line 6 - page 6, line 22 figures	8

X	US 2002/062130 A1 (JUGENHEIMER KRISTEN A ET AL) 23 May 2002 (2002-05-23)	7,12-15
	page 4, paragraph 94 - page 12, paragraph 160 figures 1-33	

A	US 4 566 620 A (GREEN ET AL) 28 January 1986 (1986-01-28)	1
	column 6, line 67 - column 7, line 2 figure 13	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2006/007355

Box 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.: 21-27, 42-51
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
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 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:

see additional sheet

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 an additional fee, this Authority did not invite payment of any additional fee.
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.:
1-15

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15

Clip or staple applicator comprising a handle, curvilinear shaft and a distal jaw assembly and the clips for use therewith.

2. claims: 16-20

Instrument comprising a handle, shaft, and distal jaw assembly with means to apply energy to tissue to cut and clot tissue.

3. claims: 28-41

Endoscope for transanal treatment of hemorrhoids comprising a handle, and an insertion portion comprising a tubular wall, the distal end of which having a frustoconical shape.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2006/007355

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0191646	A	06-12-2001	AU 5475701 A	11-12-2001
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			WO 8602255 A1	24-04-1986

专利名称(译)	用于组织腔内治疗的装置，夹子，内窥镜和方法，例如，痔疮		
公开(公告)号	EP1983906A1	公开(公告)日	2008-10-29
申请号	EP2006776413	申请日	2006-07-26
[标]申请(专利权)人(译)	伊西康内外科公司		
申请(专利权)人(译)	爱惜康内镜手术，INC.		
当前申请(专利权)人(译)	爱惜康内镜手术，INC.		
[标]发明人	THOMPSON BRIAN JAMES POPOVIC DRAGO PASTORELLI ALESSANDRO BILOTTI FEDERICO		
发明人	THOMPSON, BRIAN, JAMES POPOVIC, DRAGO PASTORELLI, ALESSANDRO BILOTTI, FEDERICO		
IPC分类号	A61B17/064 A61B17/072 A61B17/068 A61B17/128 A61B17/122 A61B1/31		
CPC分类号	A61B17/072 A61B1/31 A61B17/0643 A61B17/068 A61B17/07207 A61B17/1227 A61B17/1285 A61B2017/0641 A61B2017/07221 A61B2017/3452		
优先权	102006901385823 2006-02-15 IT 102006901397683 2006-03-21 IT		
其他公开文献	EP1983906B1		
外部链接	Espacenet		

摘要(译)

一种用于组织管腔内治疗的装置包括手柄，从手柄延伸的轴和设置在轴的远端的头部，其中头部包括至少一个钳口，可在打开位置之间移动，其中用于插入组织和周围组织的窗口，以及闭合位置，并且其中轴在曲柄纵向方向上在手柄和头部之间延伸。