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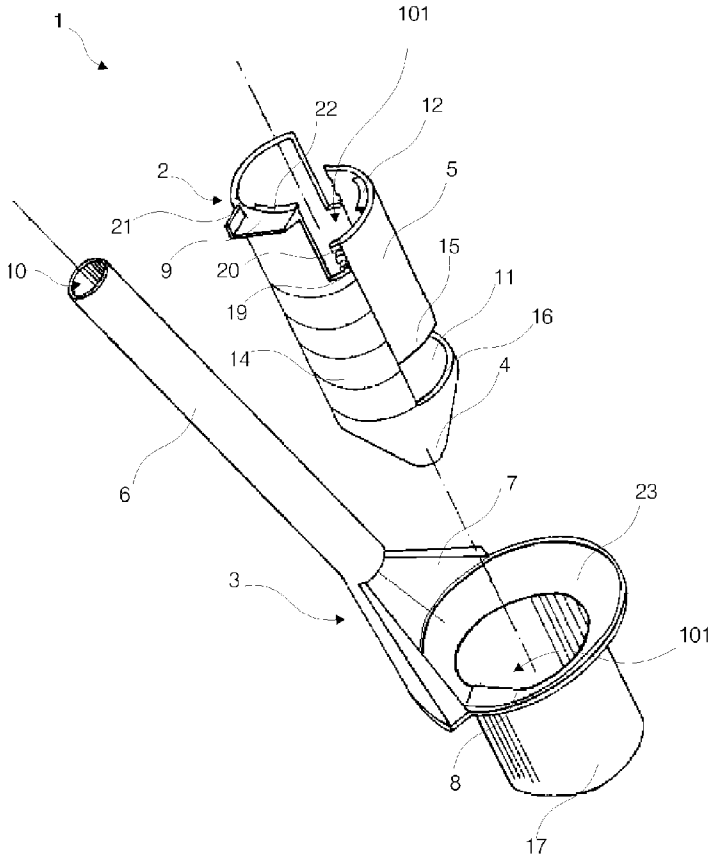
(54) **Title:** ANOSCOPE



(57) **Abstract:** This invention relates to an anoscope (1) that comprises a back piece (3) to stand on; a handle (6) with a longitudinal axis that faces the front piece (2) of the anoscope (1), particularly the sliding lid (5) and the window (11) when the lid (5) is opened; a broadly piece (7) that is located at the junction of the handle (6) and the front piece (2) and that sits on the front piece (2); a socket (8) on the surface of the atrium (23) of the broadly piece (7); a cylindrical extension (17) inside the broadly piece (7); a sliding lid (5) located on the front piece (2) that can either be separated totally from the front piece (2) or can form a window (11) that opens to the desired extent; a protrusion (12) located at the inner surface of the sliding lid (5) that facilitates the lid (5) being handled and pulled; a tongue (9) distal to the front piece (2) that sits on the socket (8) and manages locking and unlocking processes of the front piece (2) and the back piece (3); and a pillar (21) and a console (22) located on both sides of the tongue (9) that are used to unlock and remove the front piece (2).

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Description

ANOSCOPE

[1] FIELD OF THE INVENTION

[2] This invention relates to anoscope which is used in hemorrhoidal surgery.

[3] BACKGROUND OF THE INVENTION

[4] The present state of the art involves anoscopes that are used in hemorrhoidal surgery. Anoscopes are conical-tipped cylindrical devices that are inserted into rectum through the anus by the help of the conical tip that enlarges the anal canal and are advanced in rectum up to a particular distance. The handle, a part of the anoscope that remains outside the body, is used to rotate the anoscope 360 degrees inside the rectum.

[5] In the state of the art, some anoscopes have a cavity in their handles into which a light source can be inserted. Thus, the inner part of the anoscope becomes more visible. Such an anoscope has been the subject of the European patent application numbered EP1183991.

[6] Anoscopes with adequately large hole diameters through which devices for surgical interventions can be inserted have been subjects of the above-mentioned European patent application EP1183991; the USA patent applications US20060036129 and US20030130559; and the Japanese patent application JP2003235799.

[7] Although the hole diameter of the anoscope mentioned in the International patent application WO2004064624 is small, it is possible to ligate vessels of the hemorrhoids through a window which is placed near the tip of the anoscope.

[8] In the state of the art, some anoscopes have constant hollow diameters like that mentioned in the USA patent application US6142933. Upper part of some of these anoscopes is totally open, while some anoscopes, like that mentioned in the USA patent application US20060009797, have wide longitudinal slots. Hemorrhoids that fill these slots can be removed surgically.

[9] Anoscope-resembling cylindrical anal retractors mentioned in the USA patent application US5681265 have variable inner hollow diameter, however a light source can not be inserted into their handles. Furthermore, performing the procedure of stapled hemorrhoidopexy is not possible using these retractors. The anoscope mentioned in the USA patent application US6142933 has a constant hole diameter and an open top, and has been planned for the application of a purse string suture to rectum. However, hemorrhoids hanging down from this open top block the vision thereby making it difficult to put a purse string suture to rectum.

[10] For the present applications of the technique, surgical interventions cannot be performed using anoscopes with small inner diameters. Although suturing is possible through the window placed at the tip of the anoscope mentioned in the International

patent application WO2004064624, this anoscope can not be used for surgical removal of hemorrhoids, for putting purse string suture to rectum and for stapled hemorrhoidopexy.

[11] None of the anoscopes in the present state of the art are suitable for insertion of a laparoscope and none of them have an adjustable sliding lid that covers the open top of the anoscope. Besides, the above-mentioned anoscopes cannot be used for controlling staple line and they do not allow surgical interventions as necessary.

[12] BRIEF DESCRIPTION OF THE INVENTION

[13] One objective of this invention is to build an anoscope that has an adjustable opening with a sliding lid through which a purse string suture can be applied to the rectal mucosa; that can hold a laparoscope in its handle; and that allows performing stapled hemorrhoidopexy.

[14] Another objective of this invention is to build an anoscope that prevents hanging of hemorrhoids down by an adjustable sliding lid so that the hemorrhoids do not block the vision and they do not complicate application of a purse string suture.

[15] Another objective of this invention is to build an anoscope that has a scale on it allowing measurement of the distance to intervene surgically in the rectum.

[16] Another objective of this invention is to build an anoscope that allows insertion of laparoscope in its handle to visualize and take records of the scene.

[17] Another objective of this invention is to build an anoscope that is sterile and disposable, and thus hygienic.

[18] Another objective of this invention is to build an anoscope that allows control of the staple line and surgical intervention as necessary.

[19] Another objective of this invention is to build an anoscope that has multiple pieces that can readily be assembled or disassociated.

[20] A further objective of this invention is to build an anoscope that allows surgical removal of hemorrhoids using the classical method when its sliding lid is dissociated.

[21] BRIEF DESCRIPTION OF THE DRAWINGS

[22] The anoscope built to achieve the objectives of this invention has been shown in attached figures, where;

[23] Figure 1 shows front and back pieces of the anoscope separately;

[24] Figure 2 shows front and back pieces separately in another embodiment thereof;

[25] Figure 3 shows front and back pieces separately in another embodiment thereof;

[26] Figure 4 shows front and back pieces separately in another embodiment thereof;

[27] Figure 5 shows the sliding lid fully open in a top schematic view thereof;

[28] Figure 6 shows the sliding lid half open in a side schematic view thereof;

[29] Figure 7 is a full view thereof; and,

[30] Figure 8 shows the front piece separated from the lid thereof.

[31] Each piece in the figures has been numbered as follows:

[32] 1. Anoscope

[33] 2. Front piece

[34] 3. Back piece

[35] 4. Nozzle

[36] 5. Lid

[37] 6. Handle

[38] 7. Broadly piece

[39] 8. Socket

[40] 9. Tongue

[41] 10. , 101. Cavity

[42] 11. Window

[43] 12. Protrusion

[44] 13. Connection element

[45] 14. Body

[46] 15. Front border

[47] 16. Front tip

[48] 17. Extension

[49] 18. Cap

[50] 19. Slide line of the front piece

[51] 20. Slide line of the lid

[52] 21. Pillar

[53] 22. Console

[54] 23. Atrium

[55] 24. Handhold

[56] 25. Shutter

[57] DETAILED DESCRIPTION OF THE INVENTION

[58] The inventive anoscope (1) comprises, in its most basic form, a handle (6), a broadly piece (7), an atrium (23) inside the broadly piece (7), a socket (8), a cylindric extension (17), a back piece (3) that holds a handle (6) with adequate cavity (10) that allows passage of such additional devices as laparoscope; a striped body (14), a nozzle (4), a sliding lid (5), a superficial protrusion (12) inside the lid (5), and a front piece (2) that has a tongue (9) where it meets the back piece (3).

[59] The inventive anoscope (1) has a front piece (2) with a conical-shaped nozzle (4) that narrows at the tip. A sliding lid (5) is placed on the top of the front piece (2). When the sliding lid (5) is closed, upper part of the front piece (2) is completely shut because the front tip (16) of the sliding lid (5) becomes adjacent to the front border

(15) of the front piece (2) (Figure-6). The lid (5) can be opened to the extent required for the type of surgery or it can completely be separated from the front piece (2) (Figures 1,2). The lid (5), concordant with the structure of the front piece (2), is protuberant and slide line of the lid (20) ensures movement of the lid (5) on the front piece (2). An interlaced relation between the edges of the front piece (2) and the lid (5) at the slide lines (19,20) ensures that the lid (5) does not fall out of, or into the anoscope (1) (Figures 1,2). In one embodiment of the invention, a protruding appearance (19) occurs on the front piece (2) when the dent is on (20) the lid (5). In another embodiment of the invention, a protruding appearance (20) occurs on the lid (5) when the dent (19) is on the front piece (2). Thus, the lid (5) and the front piece (2) have a complete harmony and they move by sliding of one on the other. A protrusion (12) exists at the inner side of the sliding lid (5) that facilitates handling of the lid and its movements (5) (Figures-1,2,7). The protrusion (12) is preferably placed at the inner surface of the protuberant part close to the broadly piece (7).

[60] The back piece (3) of the anoscope (1) is comprised of a terminal tube-shaped handle (6) and a broadly piece (7) that combines with the front piece (2) in the middle. There is a cavity (10) inside the handle (6). The handle (6) terminates where it meets the broadly piece (7) without, or with, a small change in its diameter. The broadly piece (7) that starts at the same point with the wide part of the handle (6), opens as a triangle and combines with the atrium (23). The atrium (23) is a flat, concave structure that resembles a hollow plate. A cylindrical extension (17) lies at the same level as the circle formed by the atrium (23) through the front piece (2) surrounding it completely. The broadly piece (7) sits on the front piece (2) like a scoop punctured in the middle. Inner parts of the front piece (2) and the broadly piece (7) of the back piece (3) that combines with the front piece (2) have cavities (101) resembling that of the handle (6). However, the front piece's (2) cavity (101) ends with the nozzle (4). The nozzle (4), located at the beginning of the front piece (2), is the closed conical tip that facilitates anoscope's (1) insertion through the anal canal.

[61] A socket (8) is placed on the surface of the atrium (23) inside the broadly piece (7). A tongue (9) to be placed into the socket exists between the front (2) and the back (3) pieces. Combination of the front (2) and the back (3) pieces that are otherwise separate is ensured by the transfer of the front piece (2) through the broadly piece (7). After the front piece (2) is transferred through the broadly piece (7) and the extension (17), assembly or disassembly of the atrium (8) and tongue (9) is maintained by rotating the front (2) or the back (3) piece. Thus, the anoscope (1) can be used as a whole or as two separate pieces.

[62] The tongue (9) has both a console (22) through the cavity (101) inside the front piece (2) and a tiny pillar (21) that makes a 90-degree angle with its own axis. The

pillar and the console (21, 22) are auxiliary parts that help to rotate or take out the front piece (2).

[63] In another embodiment of the invention, handholds (24) are found in the inner surface of the atrium (23). The socket (8) terminates with the handhold (24).

[64] In another embodiment of the invention, handhold (24) can be placed at the lateral part of the outer circumference of the atrium (23).

[65] Anoscope (1), when front (2) and back (3) pieces are combined, has the adequate length to reach the rectum. Anoscope (1) is inserted into the rectum by moving forward through the anal canal after application of a lubricant solution on the nozzle (4) of the front piece (2) while the sliding lid (5) is closed (Figures-1,2,3). During insertion of the anoscope (1) into the rectum, its handle (6) and the broadly piece (7) of the back piece (3) are moved forward manually. Anoscope (1) is completely inserted into the rectum when the broadly piece (7) of the back piece (3) reaches the anal canal. Anoscope (1) has stripes with certain distances from each other on the body (14) of its front piece (2) which function as a scale to determine the length in centimeters of anoscope part that is in the rectum and the distance that the window (11) proceeded. Inner diameter of the anoscope (1) is wide enough to allow surgical intervention.

[66] Anoscope (1) is a transparent device which can be illuminated. These properties ensure a better inspection of hemorrhoids. Anoscope (1) can be rotated 360 degrees which makes surgical intervention possible in all quadrants of the rectum. The front piece of the anoscope (1) can be taken out by rotating the socket (8) on the broadly piece (7) of the back piece (3) after pushing the pillar (21) on the tongue (9) which is distal to the front piece (2) (Figure-1). The front (2) and the back (3) pieces are dis-associated from each other by pulling the tongue (9) which is taken out of the socket (8) off the console (22) that faces the cavity (101). The cylindric extension (17), a part of the back piece (3), stays in the anal canal after the front piece (2) is taken out. Inner diameter of the extension (17) is large enough to allow passage of any given stapler anvil. Stapler is inserted through the cavity (101) that is inside the back piece (3) but also close to the front piece (2); then it is attached to the anvil that is already placed in the rectum and locked. Rectal mucosa is peeled and stapled in a circular way by pulling the trigger of the stapler. After the stapler is taken out, the front piece (2) is inserted through the cavity (101) into the back piece (3) and the tongue (9) distal to the front piece (2) is inserted into the socket (8) on the broadly piece (7) of the back piece (3) and locked. The lid (5) on the front piece (2) then can be opened to visualize the stapled mucosa line. This window (11) also allows suturing in case of a hemorrhage.

[67] In order to surgically remove internal hemorrhoids in classical hemorrhoid operations, the sliding lid (5) is pulled until the window (11) is completely opened when the anoscope (1) is inside the rectum. This makes it possible to remove the

hemorrhoids that fill the window opening and to put sutures in the surgical area. Classical hemorrhoidal operation is completed after the other two hemorrhoids are removed by rotating the anoscope (1).

[68] A lamp pen or a laparoscope can be placed in the handle (6) of the anoscope (1) sin ce there is enough room in the cavity (10). Longitudinal axis of the handle (6) faces the sliding lid (5) on the front piece (2) of the anoscope (1). Thus, the lamp pen that is placed in the handle illuminates the whole interior of the anoscope (1), in particular, the window (11) opening. Likewise, it is possible to videotape the scene in the window (11) and to videotape the surgical intervention by placing a laparoscope in the handle (6) cavity (10).

[69] While the back piece (3) of the anoscope (1) is still in rectum, the tongue (9) that is distal to the front piece (2) can be unlocked and removed from the socket (8) on the atrium (23) that is located inside the broadly piece (7) of the back piece (3) by pushing the pillar (21), thus allowing free rotation for 360 degrees of the front piece (2) inside the back piece (3) which gives the surgeon a free movement ability.

[70] In another embodiment of the invention, a transparent cap (18) that is twisted to open is found on the tip of the handle (6) close to the broadly piece (7) and the front piece (2). The cap (18) must be in closed position if a device like lamp pen will be placed in the handle (6). Devices like lamp pen can be isolated by placing a shutter (25) on the back of the handle (6) (Figure 3). Thus, a sterile surgery is assured. If a la-paroscope will be placed in the handle (6), the cap (18) is opened or totally removed and laparoscope is advanced through the cavity (10) in the handle (6) to the desired distance. Laparoscope's stability is ensured by the connection element (13) that is located on the tip of the handle (6) distal to the anoscope (1) when it reaches the desired distance.

[71] INDUSTRIAL APPLICABILITY

[72] The subject of the invention, anoscope (1), when its sliding lid (5) is closed, can readily be inserted into rectum by the use of its handle (6). It is possible to illuminate the anoscope's (1) interior by placing a laparoscope in its handle (6) which also makes it possible to visualize the operation with other surgeons by transferring the view to a monitor and to videotape it for further use in medical education. The opening ability of the anoscope's (1) sliding lid (5) to the desired extent allows many procedures to be performed. Certain amount of rectal mucosa that does not block the view and peripheral suturing is allowed to enter through the window (11) that is created by opening of the lid (5) for a few milimeters and peripheral suturing is completed by rotating the anoscope (1) for 360 degrees. When the front piece (2) of the anoscope (1) is removed, the handled-part of the anoscope (1) is left behind in the anal canal. This part allows the transfer of stapler anvil and the handle of the anvil is fixated by the tails

of the purse string suture. Stapler is passed through the same space and is attached to the anvil. When stapler is fired a mucosal ring is cut and mucosa is stapled circularly thus completing the process. Staple line that formed following hemorrhoidopexy can be checked by opening the sliding lid (5) to the required extent; this makes it possible to surgically intervene in the staple line as necessary.

[73] In another embodiment of the invention, the sliding lid (5) is removed so that the top of the anoscope (1) is fully open to allow the surgeon remove the hemorrhoids that fill the window (11) and then suture the wound in a classical hemorrhoid surgery session. Subsequently, the anoscope (1) is rotated to remove the other two hemorrhoids and complete the surgery session by suturing the relevant wounds.

[74] The invention can be produced as a disposable anoscope (1) which is discarded after single use. Thus, the invention has hygienic property.

[75] Multiple-use applications of the invention is produced from a material that is strong as steel.

[76] Surrounding this basic concept, it is possible to create many different embodiments of the the subject of the invention, anoscope (1). The invention principally is reflected by the claims, and cannot be limited to the examples herein.

Claims

[1] A transparent, illuminateable, multi-piece anoscope (1) with an inner diameter large enough to allow surgical intervention comprising a back piece (3) that includes a tube-shaped handle (6) with a cavity (10), a conically-shaped nozzle (4) with a closed tip and a front piece (2) that has a cavity (101) up to the nozzle (4); characterized in that said anoscope (1) comprises
the followings that are located on the back piece (3),
- a handle (6) that has a longitudinal axis facing the anoscope's (1) front piece (2), particularly, the sliding lid (5) and the window (11) formed by the opening of the lid (5),
- a broadly piece (7) with an atrium (23) located in the middle of the connection site of the handle (6) with the front piece (2),
- a socket (8) on the atrium (23) located in the broadly piece (7) and a cylindric extension (17) that lies through the broadly piece (7);
and the followings that are located on the front piece (2),
- a striped body (14)
- a sliding lid (5) that can be opened to the desired distance and that can totally be removed from the front piece (2),
- at least one superficial protrusion (12) that helps better handling or pulling of the sliding lid (5),
- a tongue (9) distal to front piece (2) that sits in the socket (8) and that helps locking or unlocking of the front piece (2) to the back piece (3), and
- a console (22) located on one side of the tongue (9) and a pillar (21) located on the other side of the tongue (9) lying towards the cavity (101) inside the front piece (2) that are used for removing by rotation of the front piece (2) of the anoscope (1).

[2] An anoscope (1) as claimed in Claim 1, wherein slide lines comprise a front piece (2) with dents, and a protuberated lid (5).

[3] An anoscope (1) as claimed in Claim 1, wherein slide lines comprise a protuberated front piece (2), and a lid (5) with dents.

[4] An anoscope (1) as claimed in any of the above-mentioned claims, wherein the front (2) and the back (3) pieces can be used as a whole or separately by locking or unlocking of the tongue (9) and the socket (8).

[5] An anoscope (1) as claimed in any of the above-mentioned claims, wherein the inner diameter allows the passage of a stapler anvil and an extension (17) is found after the front piece (2) is removed.

[6] An anoscope (1) as claimed in any of the above-mentioned claims, wherein the

tongue (9) that is distal to the front piece (2) can be unlocked and removed from the socket (8) on the atrium (23) that is located inside the broadly piece (7) of the back piece (3) by pushing the pillar (21), thus allowing free rotation for 360 degrees of the front piece (2) inside the back piece (3) while the back piece (3) of the anoscope (1) is still in rectum.

[7] An anoscope (1) as claimed in any of the above-mentioned claims, wherein the broadly piece (7) comprises handholds (24).

[8] An anoscope (1) as claimed in any of the above-mentioned claims, wherein the handle (6) comprises at least one connection element (13) that helps place such additional devices as laparoscope and a transparent cap (18) covering a part of the handle (6) facing the broadly piece (7) that can be opened and closed or completely removed.

[9] An anoscope (1) as claimed in Claim 8, wherein the handle (6) comprises a shutter (25).

[10] A disposable anoscope (1) as claimed in any of the above-mentioned claims.

[11] An anoscope (1) as claimed in Claim 9 that is strong as steel and that can be used for multiple times.

FIGURE 1

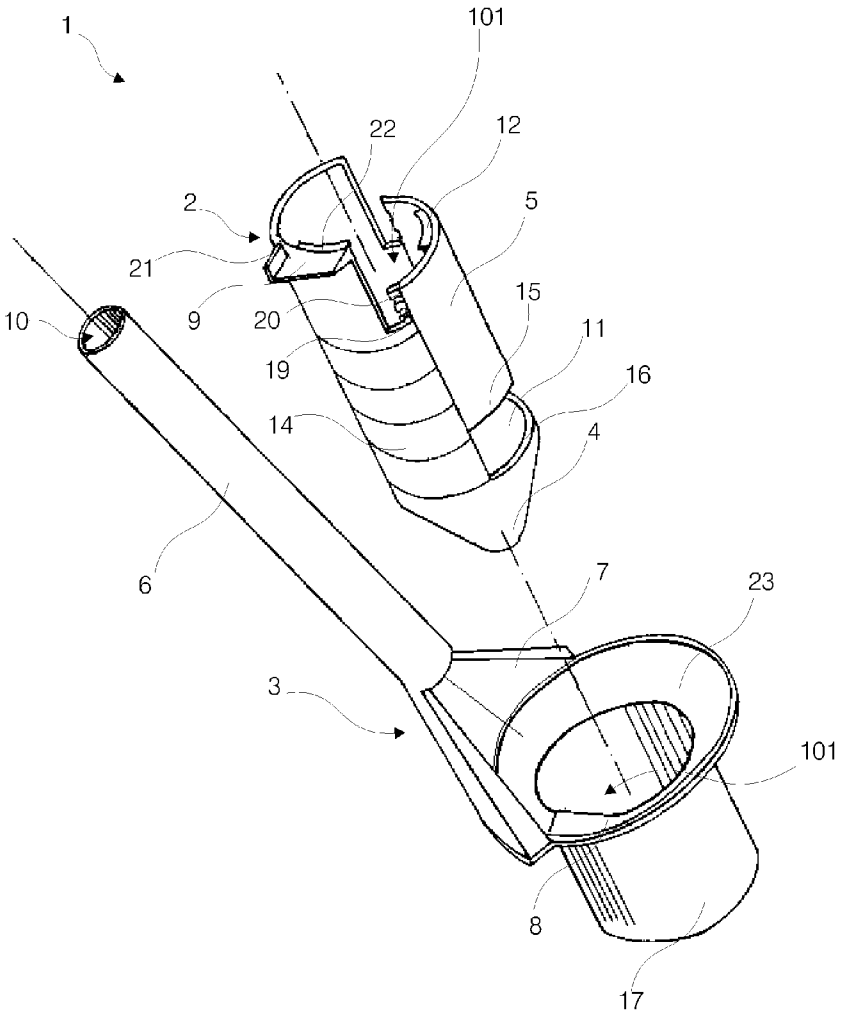


FIGURE 2

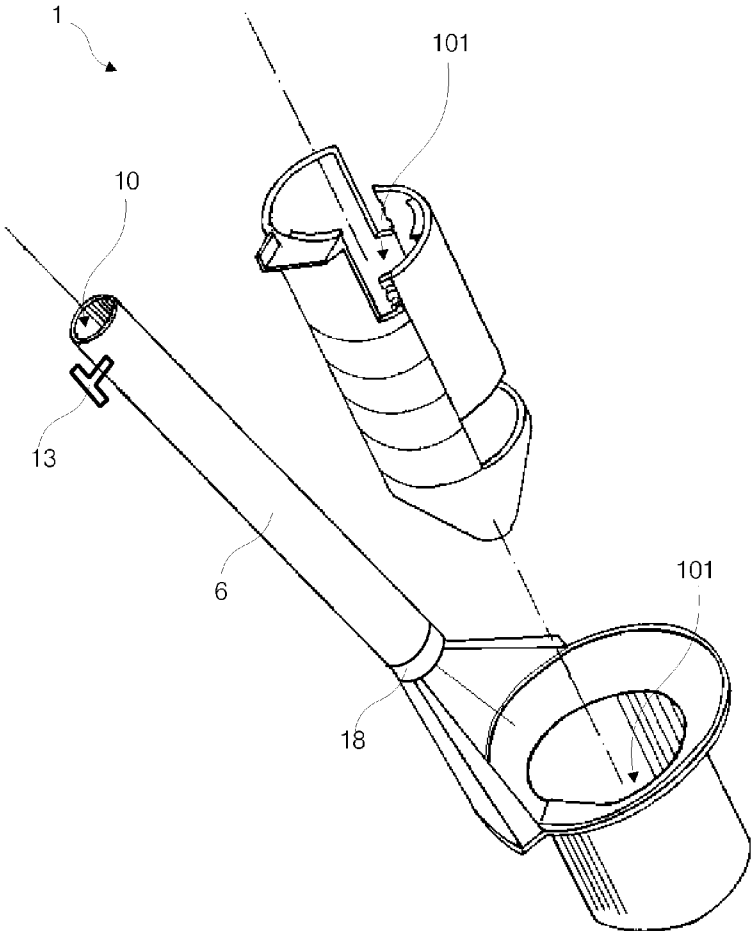


FIGURE 3

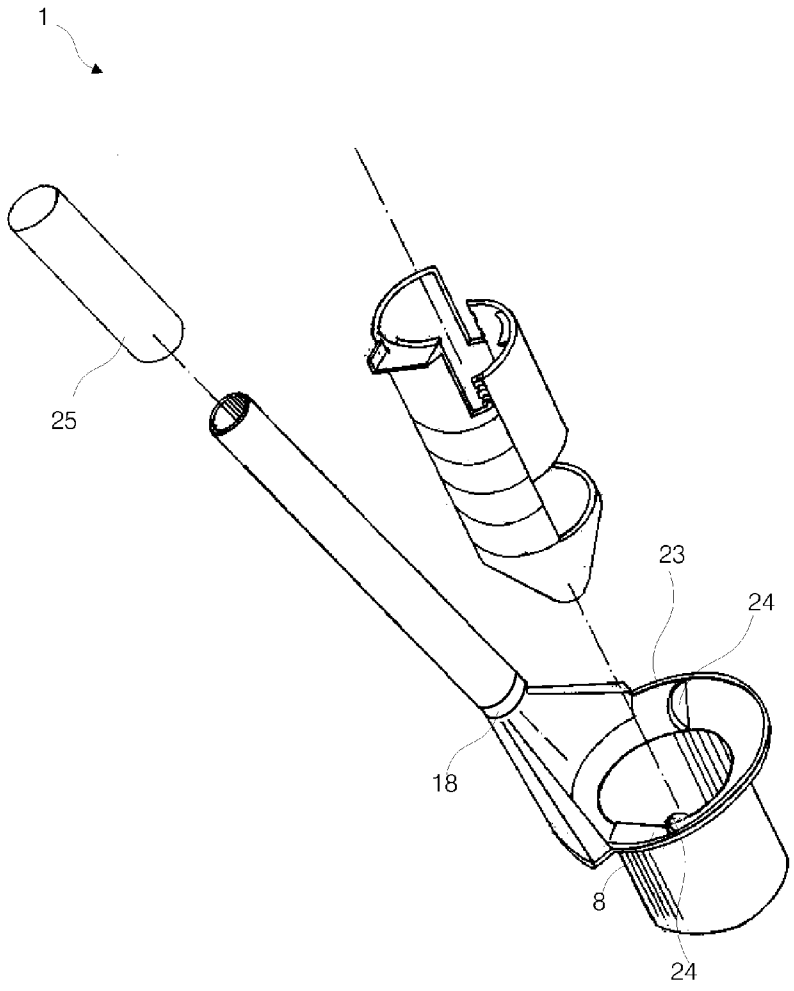


FIGURE 4

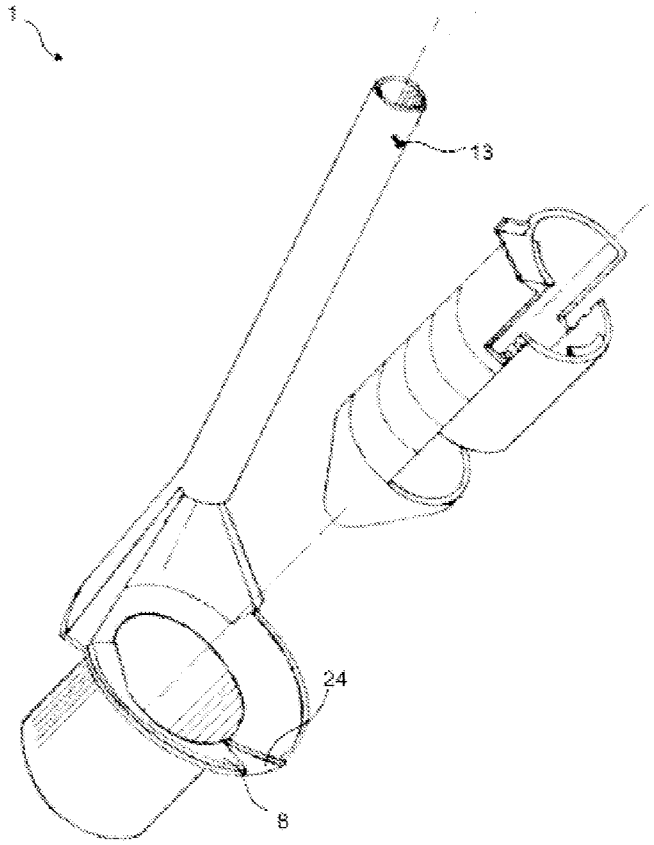


FIGURE 5

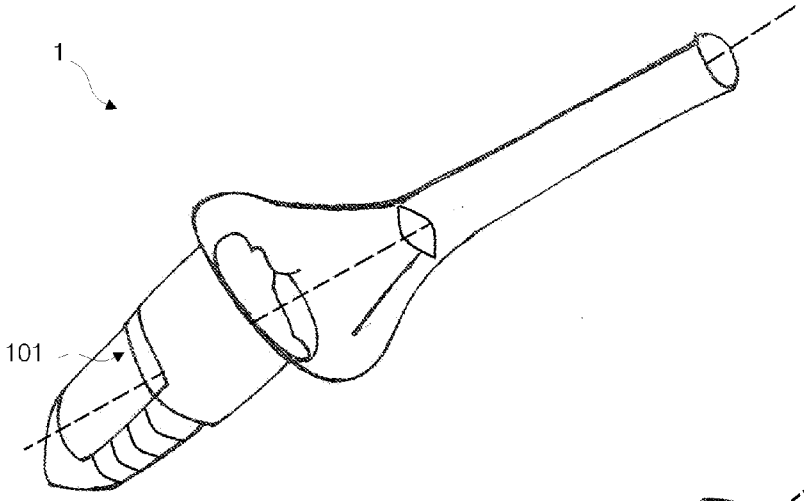


FIGURE 6

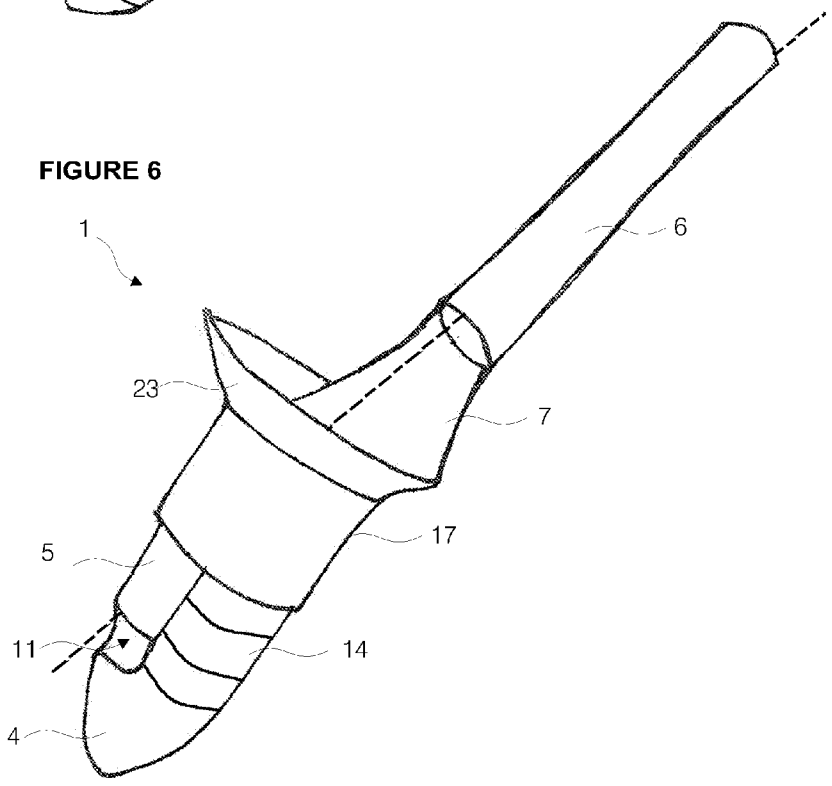


FIGURE 7

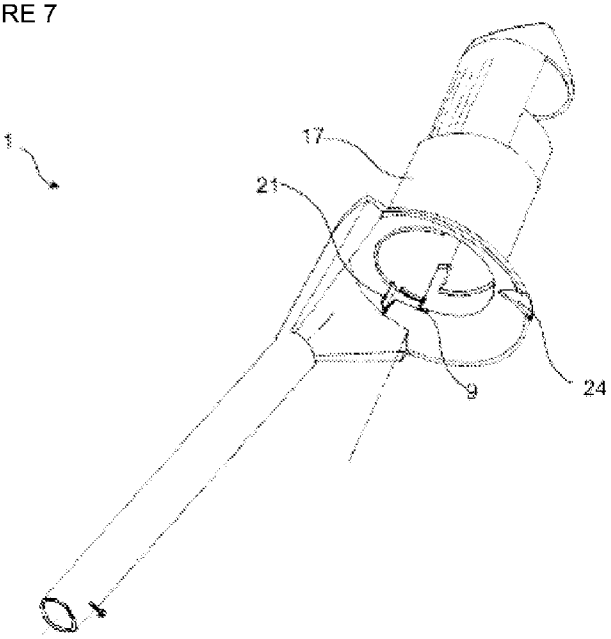
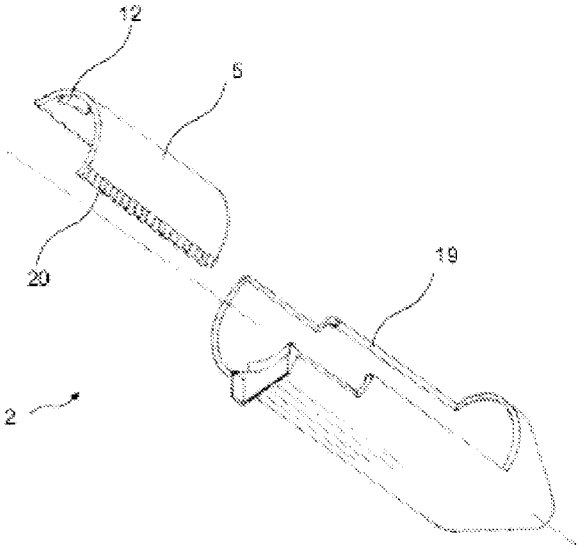


FIGURE 8



INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2007/050730

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B1/31 A61B1/32

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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/021874 A (SIAS FRANCESCO [IT]) 18 March 2004 (2004-03-18) cited in the application abstract; figures 1-5	1-11
A	US 4 819 620 A (OKUTSU ICHIRO [JP]) 11 April 1989 (1989-04-11) column 3, lines 53-64; figure 3a	1-11
A	US 2006/009797 A1 (ARMSTRONG DAVID N [US]) 12 January 2006 (2006-01-12) cited in the application abstract; figures 1,2	1-11
A	US 457 787 A (LEISENRING HENRY G. [US]) 18 August 1891 (1891-08-18) the whole document	1-11

☐ Further documents are listed in the continuation of Box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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摘要(译)

肛门镜（1）本发明涉及一种肛门镜（1），它包括一个站立的背部件（3）;手柄（6），其纵向轴线面向肛门镜（1）的前件（2），特别是当盖子（5）打开时滑动盖（5）和窗口（11）;宽度件（7），位于手柄（6）和前件（2）的连接处，位于前件（2）上;在宽片（7）的心房（23）的表面上的插座（8）;宽片（7）内的圆柱形延伸部分（17）;位于前件（2）上的滑动盖（5），其可以完全与前件（2）分开，或者可以形成打开到所需范围的窗口（11）;位于滑动盖（5）内表面的突起（12），便于盖子（5）的操作和拉动;位于前部件（2）远侧的舌部（9），其位于插座（8）上并管理前部件（2）和后部件（3）的锁定和解锁过程;支柱（21）和位于舌片（9）两侧的控制台（22），用于解锁和拆卸前片（2）。