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(71) Applicants and

(72) Inventors: **ARSENJEVIC, Slobodan** [YU/YU]; Mite
Cenica 22, YU-34000 Kragujevac (YU). **CAKIC, Nenad**
[YU/YU]; Dusana Bogdanovica 11, YU-11000 Beograd
(YU).

(74) Agents: **TOMIC, Dragan** et al.; Kneza Milosa 43,
YU-11000 Beograd (YU).

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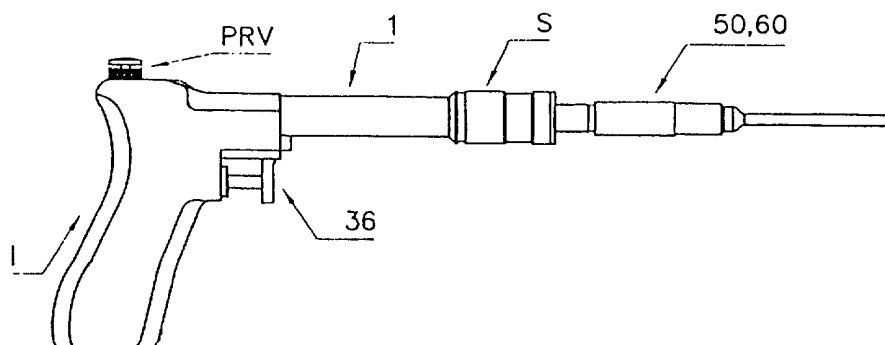
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(54) Title: INSTRUMENT FOR FLUID INJECTION AND DILATATION PROBE FOR IMPLANTATION IN BODY CAVITIES



(57) Abstract: The invention relates to the instrument for fluid injection and the dilatation probe for implantation in body cavities, which solves the problem of even and safe dilation of the probe based on a fluid injection in a probe, which takes shape of a cylinder. The instrument (I) for injection of the fluid, most favorably distilled water, consists of the handle (30), with the filling valve (24) and the variable volume cylinder (22) attached to the cover (29). In the body of the handle (30), the relief-adjusting valve (PRV), intake valve (UV), which is connected to the trigger (36) over the piston (34) and the thrust valve (PV) are mounted. The cylindrical extension (1) is attached to the fore of the body of the handle (30), with the coupling (S), for attachment of the dilatation probe (50, 60) for body cavities implantation, attached to the free end of it.



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INSTRUMENT FOR FLUID INJECTION AND DILATATION PROBE FOR IMPLANTATION IN BODY CAVITIES

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The field of technique to which the invention applies

10 The invention, in general, appertains to a field of current needs of life, that is, in a field of health, care and entertainment, and, concretely, in a field of devices for medicine implantation or application or devices for trans-duction of the body substances. The invention could, in general terms, secondarily appertain in a field of armament and mining, that is the domain of projectile launching arms without the usage of explosive charge.

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According to the International invention classification, the object of invention is designated with basic classification symbols: A 61 M 5/145, involving devices for filling or cleaning with usage of pressurized reservoirs, for instance by means of pistons, A 61 M 29/04, involving dilators that can be inflated, made of materials that can be blown up, and F 41 B 9/00 involving water pistols, that is liquid ejection pistols.

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The technical problem

The technical problem to be solved by this invention is following: how to design an instrument capable of filling with fluid, most favorably distilled water, of the dilative probe for implanting in human body cavities. This device should be simply designed, practical and safe for human usage. It should also be suitable for industrial manufacturing, as well as sterilization and maintenance. The problem of the probe, suitable for industrial manufacturing, and absolutely safe from rupture and tissue damage, is also solved. This way the problem of designing a probe for a gullet dilatation enabling a patient to be fed during the treatment according to the surgeon request is also solved. Hereby the complete device, consisting of an instrument and a probe, for even and safe probe dilation by means of fluid injection in a cylinder shaped probe would be made available. Sterilized probes are for single usage only.

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The state of the art

In non-patent and patent literature there is no knowledge of the solution for the complete device that could be used by surgeon to do a controlled fluid injection in a dilative probe enlarging it, but a number of different designs is well known, especially for the dilating probes for implantation in body cavities, that is opening – widening of the human cavities during an rectal, cervical angiological plastic surgeries.

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5 There are a lot of reasons in current medical practice that make dilatation of the human cavities, especially a cervical canal, a necessity. As a result, a variety of methods to achieve that exist. However, there are a lot of unwanted side effects, both medical and physical, because earlier devices did not comprehend the advantages of this invention.

10 It was a general practice, in early means of human uterus dilatation, to put in a set of inserts with successively increasing diameters so the dilatation would be achieved. Overcoming of the unwanted side effects was attained with dilators for body canal opening by means of application of radial force. There are a number of solutions that made radial widening of the canals possible and this was solved on a laboratory level with usage of materials that are not to be in contact with human tissue, but the
15 problem of patient protection from probe bursting, as well as industrial manufacturing problem remained. Additionally, previous methods also comprised the usage of absorbing material to be initially inserted in a cervix to dilate it after sucking up body (or some other) fluids. Prior practice have also known the ways to dilate the cervix by means of inflating devices, which had different complications in usage and are surpassed by this invention.

20 In accordance with previously mentioned and existing technical condition, some of the mentioned claims/patents present the current technical condition: claim by Robert Irvine Leninger U.S. Pat. No. 3,900,033, named DILATOR FOR THE CERVICAL CANAL; claim by Richard F. Kronser, U.S. Pat. No. 4,089,337, named UTERUS CATHETER AND MANIPULATOR WITH INFLATING SEAL;
25 claim by Stanley B. Levy U.S. Pat. No. 4,490,421 named BALLOON AND IT'S MANUFACTURING; claim by Gao Yang no. CN 19980218843U named DISPOSABLE CERVICAL DILATOR and claim by Jiang Shan No. CN 1088459 named CERVICAL DILATOR.

When we speak about concrete solutions, British Patent GB 2 297 036 shows and describes the "Inflating Cervical Dilator" which consists of an inner balloon, mounted on a flexible steel guide,
30 covered with a sleeve made of wrapped silk which is covered by the outer balloon. With the inflation of the internal balloon, the silk sleeve slides out of the plastic body, so it could take cylindrical shape suitable for cervical dilatation. Protective outer balloon takes the same shape and protects for leaks. When the silk sleeve is once inflated, it cannot be inserted again, so the device is for single usage only. The third, shortened piece of balloon holds the lower part of the silk sleeve and is also used for
35 pressure testing of the system during manufacture. Evacuation holes are made in the plastic body so the air could be evacuated in case of emergency.

Another patent, No. US4664114, named "Cervical Canal Dilator" refers to a new design of a device used for dilating various body cavities, especially a human cervix. The device consists of a hollow
40 cylindrical unit, suitable for insertion in a human uterus through a cervix, covered with an inflatable

5 diaphragm that could be selectively swollen while the device is inside the uterus, thus preventing the unwanted extraction. Additionally, when a device is already inserted through a cervix, with a diaphragm, positioned around the outer part of the device placed in a uterus cavity, already inflated, inflation of the second diaphragm, positioned around the outer part of the device near the cervical wall, occurs, thus inducing the selective dilatation of the cervix as a result of a selective inflation of a second
10 diaphragm.

Patent No. US3900033, named "Cervical Canal Dilator", describes an inflatable device aimed for dilatation of various body cavities, especially human cervix, consisting of a wrapping with an enlarged swollen part on one end and a shield at the opposite end. The wrapping can be inflated with suitable
15 gases as carbon dioxide or fluids like physiological solution – salty distilled water or similar.

Patent No. US3 84602 named "Abortion Performing Devices and Procedure" shows a process of cervical dilatation preceding the abortion and consisting of steps during which the abortion device is inserted through cervix. Then, the dilator part next to cervix is, gradually and uniformly, radially
20 expanding in uterus cavity with a controlled rate so the dilatation of cervix could be achieved by liquid injection. When the cervix is dilated fluid is removed, so the abortion could be finished after the extraction of the dilator. The instrument for cervical dilatation consists of a tube member with three extending ducts: one duct ends substantially in a distal region and communicates with a dilation part, which takes cylindrical shape after widening; second duct ends distally from first duct in an extensible
25 hardening member; and the third duct ending at the tip of the mentioned tube member, so the flow of the fluid in and out of the uterus cavity is enabled.

In another patent, No. US4832691 named "Pneumatic Rubber Tube, Especially For Stenosis Treatment", shows a rubber tube with a balloon shaped dilator pulled over the gastroscope. The balloon dilator consists of an inflatable balloon of the diameter limited by the given highest value during
30 dilation. The balloon is made of homogeneous flexible, elastic material. It has a shape of a truncated cone. A flexible tube of a given length goes through a balloon, which is attached to this tube. The dimensions of the tube are chosen in a way so the gastroscope could get through it. The transfer tube is opened inside the balloon to enable the inflation. The transfer tube is connected to the blood pressure gauge, which has a blood vent on it. Replacing the rubber tube enables conical balloons of various
35 diameters to be inserted in shrunken stomach – digestive parts of the body. With the inflation of the balloon, the shrunken element will be dilated to a predefined diameter, enabling the passage of a partly digested food.

Patent No. JP10305042 named "Cervical Canal Dilator" solves a problem of providing the cervical
40 canal dilator, which would not tire a doctor even in cases of prolonged operations and which would not

- 5 require special skills for a manual cervical canal dilating method. The problem is solved by means of a dilator with the inserting member; having a tip to be put in a vagina, with an extension attached to the member tip and stimulating parts for inserting in a cervical canal, and guides attached to a base member tip, which guides the member.
- 10 Patent No. CN1088459 named "Intelligent Automatic Uterus Dilator" shows a dilator consisting of a handle, uterus probe, fluid leading system, box for fluid injection and intelligent control panel. The mentioned handle is coated with a nontoxic transparent material with a front end connected with the probe. Both handle and probe are hollow and joined in an integrated whole. The outside of the probe is covered with elastic film, tightly terminated with a cap. From the intelligent control panel, the fluid
- 15 injection box and the fluid leading system, the film in the cervix could automatically dilate up to an immediate diameter. Thus a doctor operates comfortably and easily, while a patient feels less pain, and tissue irritation, bleeding and infection are avoided.

Although the present state of the art knows a variety of techniques and devices, the present invention

20 applies to a new design of the instrument for fluid injection and a dilator, which is to be used as a dilator for a variety of body cavities, especially human cervix. This device has different advantages in regard to the mentioned devices not mentioned in a present state of the art.

Therefore, the objective of the invention is to design a new device, which is to be used as an instrument

25 with a dilator for various body cavities and surpass certain problems and disadvantages of the devices known in a present state of the art.

Invention essence presentation

Invention refers to an instrument for fluid injection with an inserted dilatation probe for implanting in

30 human cavities. The instrument basically consists of a handle, filling valve, relief-adjusting valve, intake valve, thrust valve, cylindrical extension and a coupling for a dilating probe attachment. A "fluid" needed for the operation of the instrument assumes distilled water as the most favorable solution. The intake of the coupling for the dilatation probe attachment is opened with an especial cover during the sterilization. It is important to emphasize that the dilatation probes are provided for

35 single-use.

The instrument consists of a handle enclosed by a cover at the base. At the inside of the cover and in the handle cavity the feed valve is attached, used for priming the instrument with the distilled water necessary for it's operation. Besides the feed valve, in the handle cavity, the cylinder of a variable

5 volume is located, attached to a handle cover by means of a threaded joint. A movable piston sealed with an "O" ring is located in a cylinder.

The relief-adjusting valve is located in the handle, and, with it's base, is in connection with the handle cavity. Besides, the intake valve is located along the axis of the handle body, and is in connection,
10 through the intake tube, with the handle cavity and the trigger piston. At the upper part and along the intake valve axis the thrust valve is located. It is in connection with the central canal, which is located in the upper part and goes through the handle and the cylindrical extension. The instrument handle is connected with the coupling for a dilatation probe attachment through the cylindrical extension.

15 Dilatation probe for body cavities implantation consists of a fitting, which is inserted in the instrument coupling. At the inside of the probe, and at the extension of the fitting, there is a space limited by the inner elastic diaphragm and the armored fabric made of polyethylene with directed molecular chains wrapped in a paper wrapping. All this is shrouded with the probe cover, which presses the end of the inner elastic diaphragm against the cannal in the probe fitting. Outer elastic diaphragm, which holds the
20 injected fluid, and is attached to the probe cover cannal, is placed over the whole package.

The dilatation probe, as a production variant, aimed for gullet dilatation, consists of the instrument fitting, with the nonreturn valve at the inlet. The hose with openings for feeding is located along the hose for the pressurized fluid, which is wrapped with the outer diaphragm, armored fabric and the inner
25 diaphragm. The operation of the probe is achieved by implanting the dilatation probe through a nose until the dilating part reaches the place where the stenosis is. When this is done, the pumping of the fluid with the instrument begins, causing the dilatation. The dilatation is performed through the nonreturn valve until the diameter requested by the surgeon is achieved. After the dilatation is finished, the instrument is detached and the probe stays at the position for the time needed for the tissue
30 accommodation. The nonreturn valve maintains the pressure in the probe. After that, the instrument is attached again for further dilatation. This procedure is repeated until the end of dilatation. When the dilatation is finished, the hose for the pressurized fluid is cut and the probe is pulled out of the gullet. The probe is made of thermolabile material and is for a single usage only, so the sterilization is performed in a packed form with a cobalt bomb.

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The instrument for a fluid filling and dilatation probes for implantation in body cavities, according to this invention, have several advantages, some of the most important are specified as:

- Absolute safety of the patient, concerning the procedure as well as the medical hygienic rules
 - The possibility for the industrial manufacturing
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- Simple and safe design
 - The work with the probe is simple and practical
 - Long instrument lifetime

Short drafting description

- 10 For the purpose of easier understanding of the invention, as well as the description of the usage in practice, applicant is referring to the enclosed draft, where:

Figure 1 – shows a schematic view of the instrument for fluid filling with inserted dilatation probe for implantation in body cavities, according to the invention.

- 15 Figure 2 – shows a view of the instrument for fluid filling, as shown in Figure 1, in a vertical cross section.

Figure 3 – shows the dilatation probe for implantation in body cavities, as shown in Figure 1, in partial cross section

- 20 Figure 3a – shows the dilatation probe for implantation, as shown in Figure 1, in cross section along the A-A line

Figure 4 - shows the dilatation probe as a variant for the dilatation of the gullet

Figure 4a - shows the dilatation probe, as shown in Figure 1, in cross section along the B-B line

The detailed description of the invention

- 25 The invention, Figure 1, refers to the instrument I for fluid filling, and the dilatation probe 50, 60 for implantation in body cavities inserted wherein. The instrument I, Figure 2, basically consists of the: handle 30, filling valve 24, relief-adjusting valve PRV, intake valve UV, thrust valve PV, cylindrical extension 1 and a coupling S for the attachment of the dilating probe 50, 60. A “fluid” needed for the operation of the instrument assumes distilled water as the optimal solution, although other medically acceptable fluids could be used.
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- The handle 30 of the instrument I, Figure 2, is enclosed by a cover 29 at the base, which is sealed with the “O” ring 23 and secured from falling out by means of the bolt 28. On the inner side, on the cover 29, and in the handle cavity 30, the filling valve 24, used for pouring in of distilled water necessary for the operation of the instrument is attached. The filling valve 24 is sealed with the “O” ring 7’, mounted on the valve cap 20, under the spring 3’.
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Near the filling valve, inside the handle cavity 30, the cylinder of a variable volume 22 is located. Inside a cylinder 22, which is attached to a handle cover 29 by means of a threaded joint, and sealed

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with the "O" ring 25, is a movable piston 27 sealed with the "O" ring 26.

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In the handle body 30, on the left upper part, the relief-adjusting valve PRV is mounted and is in contact with the handle cavity 30 with its base. The relief-adjusting valve PRV consists of the piston 8 with the knob 9 sealed in a valve body 11 by means of the "O" ring 7. The valve is closed on the outside with the cap 10, while the valve body 11 is sealed in the handle 30 with the "O" ring 12 and the "O" ring 16. At the bottom of the valve PRV there is the adjusting nut 13 bolted on the valve shutter 15. The adjusting nut 13 applies a constant pressure to the adjusting spring 14, thereby pressing the shutter 15 against the surface of the "O" ring 17.

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The intake valve UV, is located along the axis of the handle body 30, and is in connection, through the intake tube 21, which is sealed in the handle 30 by means of the "O" ring 17, with the cavity in the handle 30, and the piston 34 of the trigger 36. The intake valve consists of the "O" ring 7" and the valve shutter 4" pressed by the spring 3". The "O" ring 7" and the divider 19, form an area sealed from the handle 30 by means of the "O" ring 18. At the upper part and along the intake valve UV axis the thrust valve PV is located. It is in connection with the central canal, which is located in the upper part and goes through the handle 30 and the cylindrical extension 1. The thrust valve PV consists of the "O" ring 7", valve shutter 4" pressed by the spring 3" and guided in the cover 5, which is sealed from the handle 30 by means of the "O" ring 6.

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In the front part of the handle 30 and beneath the extension 1 there is a trigger 36 sliding through the bushing 44 and returned by the spring 37 resting on the spring guide 41. The piston 34 is connected to the lower part of the trigger 36, through the plug 33 and "O" ring 32 pressed against the retainer 31, by means of the pin 35.

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The handle 30 of the instrument I is connected to the coupling S, for the attachment of the dilating probe 50, 60, by the tubular extension 1, while the extension 1 is connected to the handle with the seal in between. Inside and coaxially with the extension there is a tube, which directly connects the channel in the handle 30 with the coupling S.

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The coupling S, for the attachment of the dilating probe 50, 60, which could be named fast coupling because of the short period of time needed for the probe to be inserted within, consists of the body 39, with the lower half 43 and upper half 40 placed inside. Located inside the body 39 there is the extension 49, which seals the intake over the seal 18, thus enabling quality filling of the channel in the instrument I. The coupling body 39 is sealed in the extension 1 with the "O" ring 47. At the outside of the circumference of the body 39, the spring 46 is placed, as well as the coupling sleeve 45. The "O"

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5 ring 42 is placed between the halves 40, 43, and the body 39, while the balls 38 are placed at the inlet of the body 39.

The operation of the instrument I runs as follows: the distilled water, necessary for the operation of the instrument, is poured in the handle 30 of the instrument I, enclosed by a cover 29 at the base, which is
10 sealed with the "O" ring 23 and secured from falling out by means of the bolt 28, through the filling valve 24, sealed with the "O" ring 7', mounted on a valve cap 20, under the spring 3'. While pouring the water in the body 39 of the fast coupling S, the extension 49 is attached, thus ensuring the quality filling of the cannal in the instrument. The filling is done with the syringe for single use, until the water appears at the inlet of the extension 49. When the filling is completed, the dilatation probe 50, 60 is
15 attached to the coupling body 39, which is sealed in the extension 1 with the "O" ring 47. The probe, leaning against the "O" ring 18, pushes the upper half 40, the spring 48 and the lower half 43 until the upper half 40 leans against the "O" ring 42, enabling the balls 38 to snap into the cannal of the dilatation probe 50, 60. When this is done, the spring 46 of the sleeve 45 pushes the sleeve thus locking and sealing the dilatation probe 50, 60 in the coupling body 39. When the instrument I is filled up and
20 the dilatation probe 50, 60 inserted in the instrument consecutively pressing the trigger 36, sliding through the bushing 44 and returned by the spring 37 resting on the spring guide 41, with a finger, the movement of the piston 34, through the plug 33 and "O" ring 32, by means of the pin 35, is exerted. The "O" ring 32 is pressed against the retainer 31, thus producing pressure and vacuum in a cannal in which it slides through. In a vacuum producing cycle, through the intake tube 21, which is sealed in the
25 handle by means of the "O" ring 17, and the intake valve UV, the water is taken out of the cavity – space in the handle 30. The water is held in space formed by the "O" ring 7" and the divider 19, sealed from the handle 30 by means of the "O" ring 18. The movement of the variable volume piston 27, sealed with the "O" ring 26 in the variable volume cylinder 22, compensates the volume of the fluid taken, by means of reduction of the volume of the space in the handle 30 for the amount of the water
30 taken. The variable volume cylinder 22, which is attached to a cover 29 of the handle 30 by means of a threaded joint, is sealed with the "O" ring 25. In a pressure producing cycle, the piston 34 pushes the water through the thrust valve PV. The water passes through the extension 1, lower half 43 and upper half 40 in the dilatation probe 50, 60. With the multiple cycle repetition, the pressure in the dilatation probe 50, 60 rises to the value adjusted with the relief-adjusting valve PRV. When the preset pressure
35 value is reached, due to the overcome of the force in the regulating spring 14, the shutter 15 of the valve PRV detaches from the "O" ring 17, thus letting the water flow back in the handle 30, maintaining the constant pressure in the dilatation probe 50, 60, within the given values. In a moment when a pressure has reached the preset value, pressing the valve knob 9 exerts the piston 8, of the knob
9, movement, which pushes the shutter 15 of the valve and opens the valve, thus letting the water from
40 the dilatation probe 50, 60 flow back to the handle 30. The variable volume piston 27 moves inside the

5 variable volume cylinder 25, to enable the volume increase in the handle 30, absorbing the fluid from the dilatation probe 50, 60, thus preventing the pressure increase in the handle. During the sterilization process, the tip of the instrument is, for the protection of the instrument I, protected from damage by means of the protective cap, ensuring the dilation of the water found in the cannels.

10 The dilatation probe 50, as shown in the Figure 3 and 3a, consists of the probe fitting 51, which is to be inserted in the coupling S of the instrument I shown in the Figure 2. Inside the probe itself, and in the extension of the fitting 51, there is a space enclosed by the inner elastic diaphragm 55 and the armored fabric 56 made of polyethylene with directed molecular chains wrapped in the paper wrapping 54. All this is shrouded with the probe cover 52, which presses the end of the inner elastic diaphragm 55
15 against the cannal in the probe fitting 51. Outer elastic diaphragm 53, which holds the injected fluid, and is attached to the cannal of the probe cover 52, is placed over the whole package consisting of the elements 52, 54, 55 and 56. The performance of the dilatation probe 50 is accomplished by insertion of the probe fitting 51 in the coupling S of the instrument I, with the pressurized liquid delivered through the opening 57 in the space enclosed by the inner elastic diaphragm 55. The diaphragm dilates, under
20 the pressure, until the dimensions, previously defined by the armored fabric 56 wrapped in a paper wrapping 54, are attained. This causes the dilatation of the human cavity in which the probe is implanted, while the sealing, needed for the making of the watertight space suitable to be put under pressure, is accomplished with the probe cover 52, which presses the end of the inner elastic diaphragm 5 against the cannal in the probe fitting 51. In case the rupture of the inner elastic diaphragm 55 occurs,
25 the outer elastic diaphragm 53, attached to the cannal of the probe cover 52, which holds the injected fluid, is positioned over the whole package. Since the probe is an element for single usage only, the rigidity of the package implanted in a body cavity is accomplished by means of the paper wrapping which tears with the dilation of the inner elastic diaphragm, thus enabling the dilation of the package and preventing the reusing of the probe, which looses the necessary rigidity for implanting in a human
30 cavity after the tearing of the paper wrapping 54. The probe 50, as an element for single use, is shipped for an intervention packed and sterilized with a cobalt bomb.

The dilatation probe 60, as a production variant, shown on Figure 4 and 4a, is aimed for gullet dilatation, and consists of the fitting 65 for the instrument I, with the ball 66 and the buffer 67 of the
35 nonreturn valve placed at the inlet. Along the hose 62 for the pressurized fluid, wrapped with the outer latex diaphragm 63, armored fabric 68 and the inner latex diaphragm 64, there is a feeding hose 61 placed with the feeding opening 69. The performance of the probe is achieved by implanting the dilatation probe through a nose until the dilating part reaches the place where the stenosis is. When this is done, the pumping of the fluid with the instrument I begins, causing the dilatation. The dilatation is
40 performed through the nonreturn valve until the diameter requested by the surgeon is achieved. After

5 the dilatation is finished, the instrument is detached and the probe stays at the position for the time needed for the tissue accommodation. The nonreturn valve maintains the pressure in the probe. After that, the instrument is attached again for further dilatation. This procedure is repeated until the end of dilatation. When the dilatation is finished, the hose for the pressurized fluid is cut and the probe is pulled out of the gullet. The probe is made of thermolabile material and is for a single usage only, so
10 the sterilization is performed in a packed form with a cobalt bomb.

Industrial and other applications of the invention

The invention application originates in an obvious manner from the previous text and included

15 sketch; so further description is not necessary. The inventor checked all the functional and design characteristics of the invention at the prototype.

Claims

1. The instrument for fluid injection and the dilatation probe for implantation in body cavities, *characterized in* that the cover (29) of the handle (30) of the instrument (I) has the filling valve (24) and the cylinder (22) of a variable volume attached to it, that in the body of the handle (30) there is the relief-adjusting valve (PRV), the intake valve (UV), which is connected to the trigger (36) over the piston (34) and the thrust valve (PV), and that the cylindrical extension (1) is attached to the fore of the body of the handle (30), with the coupling (S) for attachment of the dilatation probe (50,60) for body cavities implantation, attached to the free end of it.
2. The instrument for injection, as claimed in claim 1, *characterized in* that the filling valve (24), through which the distilled water is injected in cavity of the handle (30), is attached at the inner side of the cover (29) and in the cavity of the handle (30), while the cover (29) is sealed with the "O" ring (23) and secured from falling out with the bolt (28) and that the filling valve (24) closed with the "O" ring (7') mounted on the cap (20) under the spring (3').
3. The instrument for injection, as claimed in claim 1, *characterized in* that, besides the filling valve (24) in the cavity of the handle (30), the variable volume cylinder (22), with the movable piston (27) sealed with the "O" ring (26), is attached by means of a threaded joint to the cover (29).
4. The instrument for injection, as claimed in claim 1, *characterized in* that the relief-adjusting valve (PRV), which is in contact with the cavity of the handle (30) at the base, is positioned in the left upper part of the body of the handle (30), and consists of the piston (8) with the knob (9) sealed in a valve body (11), while the valve (PRV) is closed from the outside with the cap (10), and that in the lower part of the valve (PRV) there is the adjusting nut (13) bolted on the valve shutter (15) pressuring the regulating spring (14).
5. The instrument for injection, as claimed in claim 1, *characterized in* that the intake valve (UV), which is in connection, through the intake tube (21), with the cavity in the handle (30) and with the piston (34) of the trigger (36), is located in the body of the handle (30), and that along the axis of the intake valve (UV) from the upper side the thrust valve (PV) is located, which is in connection with the central channel that goes through the handle (30) and the extension (1).
6. The instrument for injection, as claimed in claim 1, *characterized in* that in the fore of the handle (30), and under the extension (1), the trigger (36) is located, which is sliding through

- 5 the bushing (44), pressed by the spring (37) resting on the guide (41) of the spring (37), while the piston (34) is connected to the lower part of the trigger (36) with the pin (35) through the plug (33) with the "O" ring (32) pressed against the retainer (31).
- 10 7. The instrument for injection, as claimed in claim 1, *characterized in* that the handle (30) of the instrument (I) is connected to the coupling (S) for the attachment of the dilating probe (50, 60), by the tubular extension (1), while inside and coaxially with the extension (1) there is a tube, which directly connects the cannal in the handle (30) with the coupling (S).
- 15 8. The instrument for injection, as claimed in claim 1, *characterized in* that the coupling (S) for the attachment of the dilating probe (50, 60), consists of the body (39), with the lower half (43), the upper half (40) and the extension (49), which seals the intake over the seal (18) placed inside the body (39), and that at the outside of the circumference of the body (39) the spring (46) is placed, as well as the sleeve (45) of the coupling (S) and in that the "O" ring (42) is placed between the halves (40, 43), and the body (39), while the ball (38) is placed at the inlet
- 20 of the body (39) for attachment of the probe (50, 60).
- 25 9. The dilatation probe 50, for implantation in the body cavities, as claimed in claim 1, *characterized in* that it consists of the of the probe fitting (51), which is to be inserted in the coupling (S) of the instrument (I), the probe cover (52), which presses the end of the inner elastic diaphragm (55), which is wrapped in the paper wrapping (54) and the armored fabric (56) made of polyethylene with directed molecular chains, and that the outer elastic diaphragm (53), which is attached to the cannal of the cover (52) of the probe which holds the injected fluid, is placed over the whole package (52, 54, 55, 56).
- 30 10. The dilatation probe 60 for gullet dilatation as claimed in claim 1 and in the production variant, *characterized in* that it consists of the fitting (65) for the instrument (I), with the ball (66) and the buffer (67) of the nonreturn valve placed at the inlet and that along the hose (62) for the pressurized fluid, wrapped with the outer latex diaphragm (63), armored fabric (68) and the inner latex diaphragm (64), there is a feeding hose (61) with the feeding opening (69).
- 35

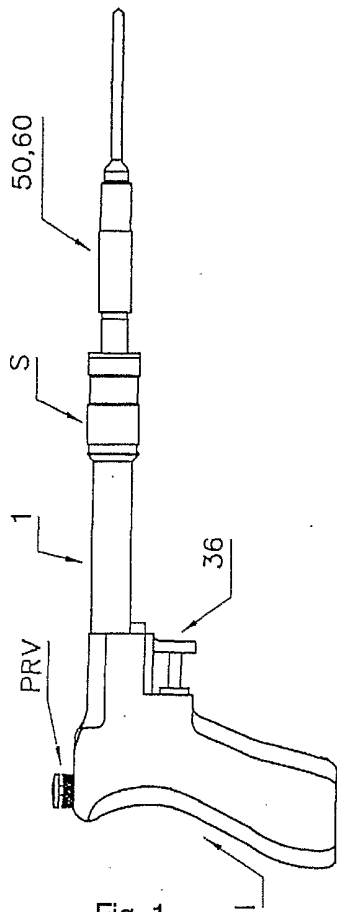
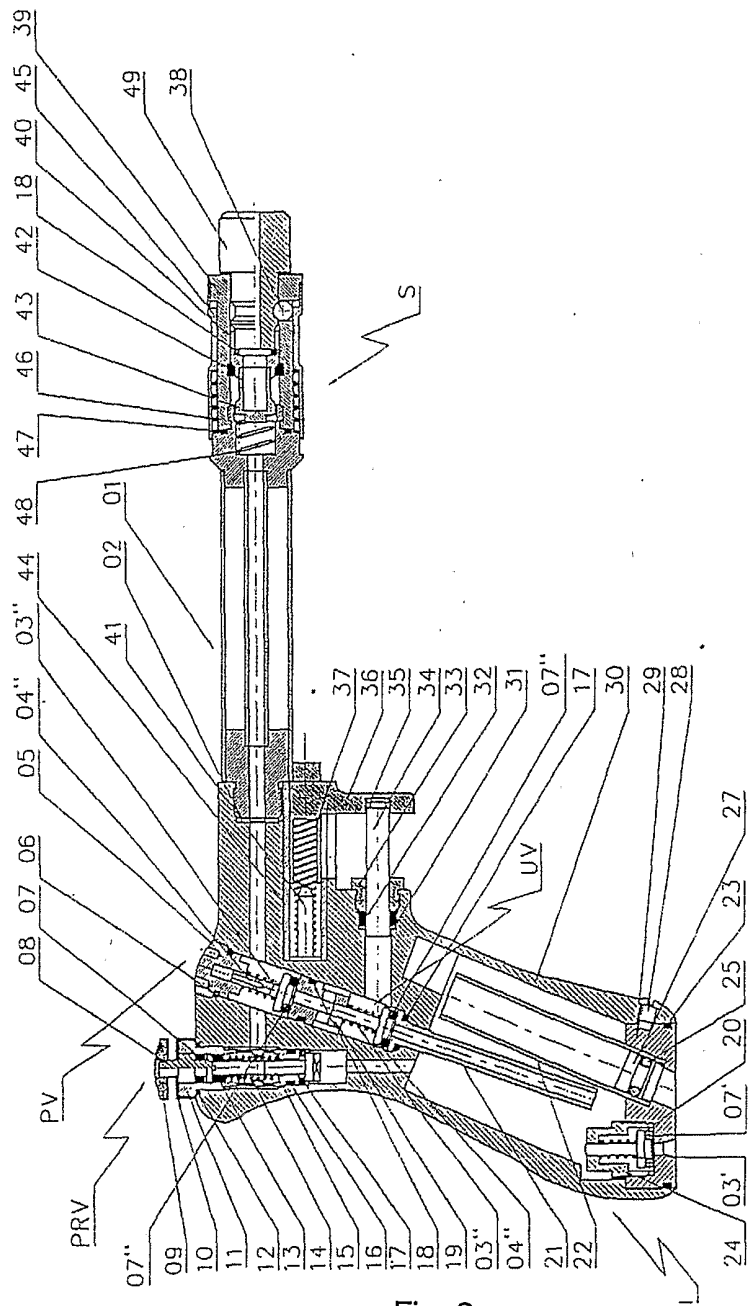
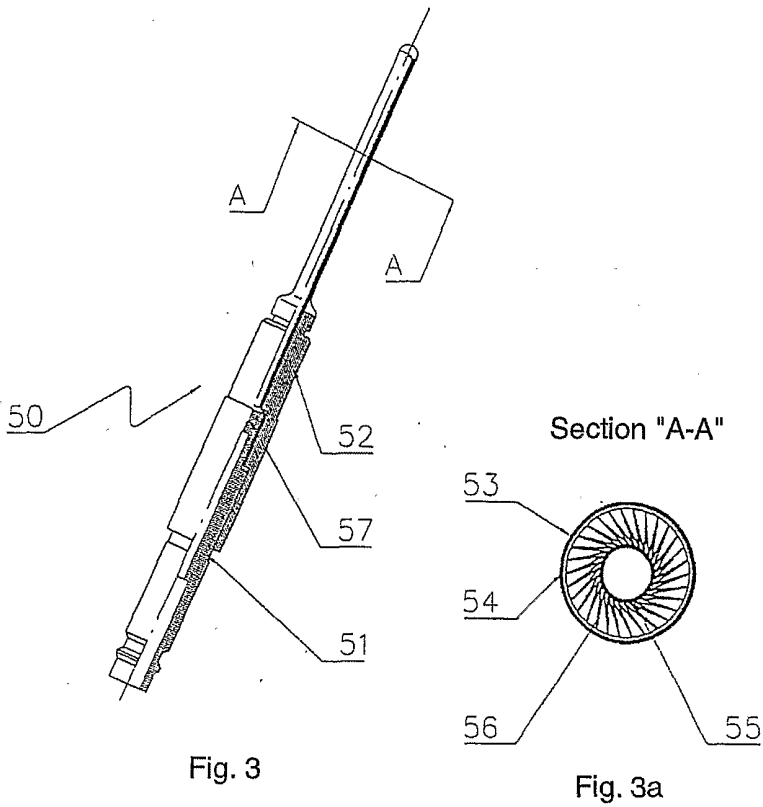
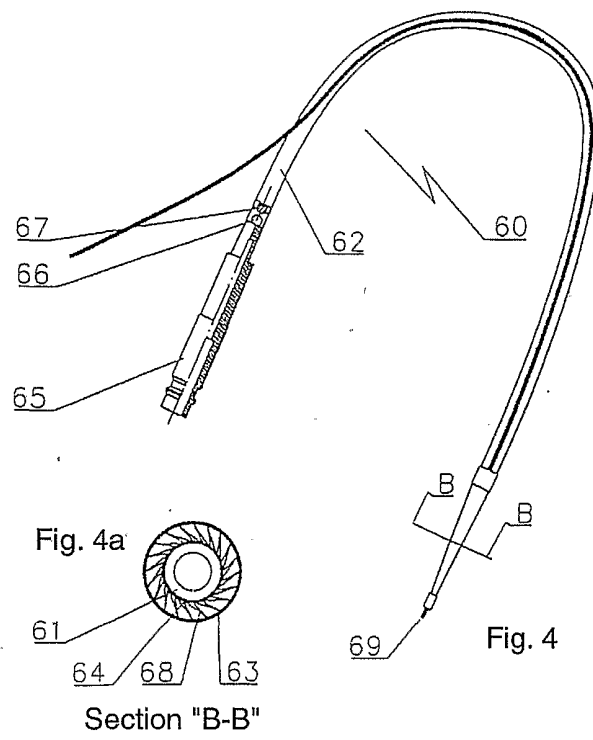


Fig. 1





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INTERNATIONAL SEARCH REPORT

International Application No

PCT/YU 01/00016

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61M29/02 A61M25/10 A61M5/142 F41B9/00

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 7 A61M F41B

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	---	9,10
A	US 3 055 371 A (GEORGE KULICK) 25 September 1962 (1962-09-25) column 3, line 52 -column 4, line 33 column 6, line 40 -column 7, line 53; figures 1,9-12	1-10
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

28 November 2001

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Jameson, P

INTERNATIONAL SEARCH REPORT

International Application No

PCT/YU 01/00016

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