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(54) INDIVIDUALLY POSITIONABLE PUMP SYSTEM

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(57) **ABSTRACT**

A pump system for use in an anal irrigation system is provided. The pump system may include a click-on mechanism or it may include a peristaltic pump. The pump system is individually positionable such that a user may decide on the optimum position of the pump system. The click-on mechanism may be provided integrated within the pump or it may be provided separate from but connected to the pump. The pump system may include a programmable pump such that it upon starting carries out a predetermined sequence. A method of providing a system for anal irrigation including an individually positionable pump is also provided. Furthermore, methods of using a pump including a click-on mechanism and a peristaltic pump are provided.

































INDIVIDUALLY POSITIONABLE PUMP SYSTEM

[0001] This invention relates to a pump system which may be positioned anywhere along a tube particularly for use in connection with an anal irrigation system. The pump system comprises attaching means and a pump and may be either of a peristaltic type or of a type having means for cutting into the tube that is pump system having a click-on mechanism.

BACKGROUND

[0002] Anal irrigation is one of a number of treatments used to aid people with bowel problems. People suffering from bowel problems are often paralyzed typically due to spinal cord injuries and confined to a wheelchair or hospitalized. In these situations, often the peristaltic functions, i.e. the reflexes and muscles of the bowel cannot be stimulated correctly. This results in constipation or random discharge of bowel contents. By using anal irrigation a stimulation of the peristaltic movements of the colon can be provided.

[0003] To perform such anal irrigation a device comprising an anal probe, also called anal catheter or speculum, is provided. The anal probe is inserted into the rectum through the anus. The anal probe is typically retained in the rectum by retention means, most commonly a balloon, which is inflated against the wall of the rectum. A liquid, such as water or a saline solution is then introduced into the rectum through the anal probe. The amount of liquid is generally below 1,5 liters, depending on the person. Prior to use, the liquid may be contained in a closed reservoir from which the liquid is removed either by applying air/gas to the reservoir by an air-tube thereby displacing the liquid through a water-tube or by sucking the liquid out of the reservoir. A pump may be used to supply the air or to provide for the suction. When the necessary amount of liquid has been introduced into the rectum, the anal probe is removed followed by a discharge from the colon through the rectum.

DESCRIPTION OF RELATED ART

[0004] WO9614888 discloses an excretion treatment apparatus composed of an insertion tool to be inserted into the anus, an irrigation solution feed unit for feeding irrigation solution from an irrigation solution tank to the insertion tool through an irrigation solution pump, and a suction/discharge unit for sucking broken and emulsified faeces to a storage vessel by a suction pump and discharging them. The suction pump is a roller pump which can securely execute sucking operation without the need of priming water even at a low flow rate and has no mechanical parts in contact with the waste solution.

SUMMARY OF THE INVENTION

[0005] The invention concerns a pump system to be used in connection with a system for anal irrigation. The pump system is not permanently attached to the anal irrigation system but may be applied at any position along the tube—in other words it is individually positionable. The pump system may be a peristaltic pump system or an incising pump system adapted to cut into the tube. The pump system comprises attaching means and a pump and may be used to pump either air or liquid. Furthermore, the system may be provided with a switch allowing the pump to be used to inflate the balloon as

well as provide for the displacement of liquid from the reservoir into the rectum. The pump may further be programmable.

DETAILED DESCRIPTION OF THE INVENTION

[0006] The invention relates in a first aspect to a pump system for use in connection with a system for performing anal irrigation, which pump system comprises a pump adapted to provide for the liquid flow into the rectum and which pump system comprises means for attaching the pump system on a tube in the anal irrigation system such that it is individually positionable.

[0007] A pump, which is not permanently attached, but attachable, is very useful for the user, as the position of the pump may be varied depending on where the reservoir is placed in relation to the user. Furthermore, all the other parts of the system may be disposable and permanently attached to each other. By making the pump of the type, which is attached and detached to the system it is possible to use a more advanced and more expensive pump. This way the pump may e.g. be electrical or even programmable so as to enable a simple use for users with a poor dexterity or little strength in their hands. For use in hospitals, pumps used only by caregivers may be provided while the remaining parts may easily be disposed of.

[0008] An anal irrigation system comprises a probe adapted for inserting in the rectum, which probe may comprise retention means in form of a cone or a balloon. Such a probe is well known in the art and will not be described further. The system also comprises a tube, which is either permanently attached to the probe or attachable to the probe. The tube is connected to a reservoir adapted for filling with irrigation liquid and again the connection may be either permanent or detachable. The reservoir is in one embodiment a closed pressure-bag where the irrigation liquid is displaced upon supply of air into the bag. In another embodiment the reservoir may be a pressurefree bag from where the irrigation liquid is sucked into the tube. The pump of this invention performs either the supply of air or the suction of the liquid. The reservoir may include a scale enabling the user of the system to see how much liquid has been pumped into the rectum.

[0009] The pump systems of this invention are individually positionable which means that the pump system may be placed anywhere along the tubes in accordance with the preferences of the user of the system. For example a caregiver may position the pump system on the floor near the liquid reservoir, which in most cases also may be placed on the floor and hence the pump system is placed on the tube quite near the reservoir. If a user uses the anal irrigation system in private then the pump system may be placed at a distance from the reservoir, as the reservoir may be placed on the floor and the user may prefer to have the pump system in a position near the lap, when the user is sitting on a toilet.

[0010] In an embodiment of the invention the pump may be an electric pump. Electric pumps are easy to use for people with poor dexterity in their hands, as the user only has to push a button to start the pump. If the user lacks strength in their hands it may be easier for them to operate an electric pump rather than squeezing a foil-pump.

[0011] In a related embodiment the pump may be programmable. The pump may be pre-programmed with a number of programmes or it may be programmed through an external keyboard or computer.

[0012] The electric pump may be provided with the following features:

[0013] a safety contact/safety device which has to be activated to enable the pump to be started

[0014] a display showing the status of the pumping action

[0015] data entry for external programming (e.g. a port)

[0016] a plug for charging of batteries

[0017] a keyboard for programming

[0018] a signalling device (e.g. light or sound) for use as alerting device or indicating device

[0019] Providing the pump with a safety contact or device prevents the user of the system from accidentally starting the pump. The display may provide for an overview of the programme-step currently running, which helps the user keeping up with the sequence. For some uses it may be beneficiary that the electric pump includes a data entry for external programming. Thereby the caregiver or user may programme the pump at another computer and just attach the data medium into the electrical pump. The programmable part of the pump may then be omitted and the pump needs only to be controllable. For private use, the pump is preferably running on batteries included in the pump. This way the user need no access to power supply near the toilet. These batteries may be rechargeable by a plug, such that the pump may be connected to a power supply for recharging the batteries. If the pump includes a programmable part then the pump may also include a keyboard for entering programme data. A keyboard enables the user to directly program the pump. The user or caregiver may then individually adapt the programme to the user until the optimum sequence for that particularly user has been found. A signalling device may be included in the pump to enable indication of for example lack of liquid, pumping problems or maximum amount of water and so forth.

[0020] The pump system may be provided with a click-on mechanism included in the attaching means and in an embodiment the click-on mechanism comprises at least one cannula adapted to cut into a tube of the anal irrigation system. By providing a cannula in the attaching means, an easy way of communication between the pump and the tube is obtained. Thus the air provided by the pump is led directly into the tube at the desired point.

[0021] The click-on mechanism may comprise a hinge. A hinge may in an easy way provide for the attaching of the pump system as one part of the click-on mechanism may be pivoted with respect to the other part thereby defining an open position for the mechanism. In the open position the tube may be admitted into the click-on mechanism. Subsequently, the mechanism is closed around the tube by pivoting the one part with respect to the other part. In a related embodiment, the pump system further comprises recesses within the click-on mechanism for receiving the tube. These recesses would help preventing of cutting through the tube with the cannula as the click-on mechanism is attached to the tube.

[0022] In an embodiment the pump system further comprises means for locking the click-on mechanism in a closed position, thereby preventing accidentally opening of the click-on mechanism, which may lead to detachment of the tube from the pump. An embodiment relates to the click-on mechanism comprising a snap mechanism. However, other types of means for locking may also be used, for example clasp closures or the like.

[0023] The pump system may comprise a switch for switching the pumping action between pumping air into the

balloon and pumping air into the reservoir to displace the irrigation liquid. Thereby only one pump system is needed in the anal irrigation system. This provides for a system, which is easy to use and fewer items are needed. The switch may be either automatic or manual. An automatic switch detects when the pressure is high enough in the balloon and then switches to pump air into the reservoir. The automatic switch may comprise a valve structure, which shifts from one position to the other as the pressure in the balloon exceeds a certain predetermined level. A manual switch may comprise a lever mechanism. Furthermore, if the pump is electric and controllable then it is possible to provide a pump system where the user need only to press the start button and then the pump automatically provides for the sequence including pumping air into the balloon.

[0024] In an embodiment the switch may be integrated in the click-on mechanism thereby providing for a compact structure of the pumping system.

[0025] This click-on mechanism may be an integrated part of the pump such that the click-on mechanism is placed within the pump. This provides a very compact type of pump. In another embodiment the click-on mechanism is separated but connected to the pump. If the click-on mechanism is separated from the pump it may be easier to fit the switch into the click-on mechanism. Furthermore, it may be difficult to provide an integrated click-on mechanism on an electric pump. In such cases, it may be easier to provide the click-on mechanism and then attach the pump as desired by user needs etc. to a standard click-on mechanism. In an embodiment, the pump system comprises two separate pumps. Some users may prefer two separate pumps-one for the balloon and one for the liquid. They may find such a pump easier to use as it is very well defined what happens if the user uses one or the other pump.

[0026] A click-on mechanism may be used with a number of different tubes. The only demand for the material is that they should be able to be penetrated by the cannulae on the click-on mechanism. The tube may comprise a thermoplastic such as PVC (Poly-Vinylechlorid)/PP (Polypropylene)/PE (Polyethylene) or a thermoplastic elastomer like a Styrol-Block-Copolymere such as a PUR (Poly-Urethane) or a SEBS (Styrene-Ethylene-Butylene-Styrene) compound or a cross-linked elastomer like silicone or latex.

[0027] The pump may be a peristaltic pump where the liquid or air is moved along the tube by applying pressure to the outside of the tube. Such a pump comprises impellers placed around an axle, which may be turned by an electric motor. Using a crank handle may also turn the axle.

[0028] In an embodiment the peristaltic pump comprises a sliding drawer with means for receiving the tube. The drawer is in communication with the impellers of the pump, such that when the drawer is closed it defines a gap between the wall of the drawer and the impellers. The gap has a size adapted to receive a tube in a somewhat squeezed condition. The means for receiving the tube may be two recesses one on each side of the drawer so the tube is placed with one end sticking out of one of the recesses and the other end sticking out of the other recess. The tube is not secured in the longitudinal direction at the recesses hence the part of the tube between the recesses can be extended or shortened. When the pump is to be used the drawer is slid out and the tube is placed transversely within the drawer. The drawer is then slid into closed position again and the impellers are then able to imply the necessary pressure to the tube so as to perform the pumping action.

[0029] A peristaltic pump would be used to suck the liquid from the reservoir and pump it into the rectum. When using a peristaltic pump most commonly another pump would be used for pumping air into the balloon.

[0030] The tubes to be used with the peristaltic pump needs to have certain resilience such that they regain their volume after being squeezed. Tubes of silicone have this property and are suited for use with a peristaltic pump. Other materials suited for use may be PUR (Poly Urethane) or SEBS (Styrene-Ethylene-Butylene-Styrene).

[0031] To hold the pump system easily at least part of the system (for example the pump) may comprise a finger-grip.

[0032] Another aspect of the invention relates to a method of providing a system for anal irrigation using an anal irrigation system comprising a closed reservoir, a probe including an inflatable balloon, an air tube and a water tube extending between the probe and the reservoir, which method comprises the step of attaching a click-on mechanism included in a pump system to the air tube at a desired position such that at least one cannula provided in the click-on mechanism penetrates the air tube.

[0033] This method provides for a very simple way of providing a system for use in anal irrigation. The reservoir, tubes and probe including the inflatable balloon may be combined to a single unit as the tubes may be permanently attached to the reservoir and the probe respectively. Hence, the only steps that needs to be done by the user to provide for the finished system are unwrapping of the unit-comprising reservoir, tubes and probe and attaching the pump to the air tube. As few steps as possible are highly advantageous particularly for users having poor dexterity but also for caregivers having a busy schedule.

[0034] In an embodiment the click-on mechanism comprises recess (es) for the tube(s) to be enclosed in the click-on mechanism. Thereby, the user is assisted in preventing penetrating the tube(s) enclosed completely in the click-on mechanism.

[0035] In another aspect of the invention, the invention provides a method of providing a system for anal irrigation using an anal irrigation system comprising a closed reservoir, a probe including an inflatable balloon, an air tube attached to an air pump and a water tube extending between the probe and the reservoir, which method comprises the step of attaching a pump system including a peristaltic pump to the water tube at a desired position by initially placing the water tube in a sliding drawer on the pump and subsequently closing the sliding drawer to provide contact between the impellers in the peristaltic pump and the water tube.

[0036] The same advantages as mentioned above are obtained using this method—for example the user only needs to attach the pump to provide for a finished system, which is ready to use.

[0037] Embodiments of the methods relates to the systems comprising tube(s), reservoir and probe being disposable. Regardless of whether a peristaltic pump system or a click-on pump system is being used, the remaining parts of the system may be disposable. As the anal irrigation process has been carried out then the pump system may be detached and the remaining parts disposed of. When a peristaltic pump is used the air pump providing for air to the balloon may be either disposable or re-useable. If the air pump is re-usable then it needs to be detached prior to disposing of the remaining parts.

If the air pump is disposable then it may be disposed of together with the remaining parts of the anal irrigation system.

[0038] In another aspect of the invention, the invention relates to a method of performing anal irrigation by using an anal irrigation system comprising a closed reservoir, a probe including an inflatable balloon, an air tube and a water tube extending between the probe and the reservoir, where the system further comprises a pump system comprising attaching means including a click-on mechanism having at least one cannula, which method comprises the steps of

- **[0039]** Connecting the pump system to the air tube such that the at least one cannula comprised in the click-on mechanism penetrates the air tube.
- [0040] Inserting the probe in the rectum
- [0041] Pumping air into the balloon until the balloon is sufficiently inflated
- **[0042]** Pumping air into the reservoir so as to displace liquid contained in the reservoir through the water tube and through the probe into the rectum until a sufficient amount of liquid has entered into the rectum
- [0043] Deflating the balloon
- [0044] Removing the probe from the rectum
- [0045] Removing the pump from the tube
- [0046] Awaiting emptying of faecal matter
- **[0047]** Disposing of the reservoir, tubes and probe and keeping the pump

[0048] Such a method is easy to use and ready to use very quickly. The only initial steps are placing the probe in the rectum and connecting the pump to the tubes—then the system is ready to use.

[0049] The balloon may be deflated by either removing or tearing a leaf on a foil-pump or by removing a cover covering a hole on the air tube between the pump and the balloon.

[0050] In an embodiment the pump system comprises a switch for switching pumping of air into the balloon and into the reservoir. The switch may be automatic or manual as described earlier. A switch allows the same pump to be used to provide air to the balloon and the reservoir, thereby saving costs. It may also provide for a more compact pump system, which is advantageous particularly for users having the pump in their lap during the anal irrigation process.

[0051] In another embodiment the pump is electric and comprises a gauge for measuring the amount of air passing through the pump. The gauge may be in the form of a calibration on the pump indication how much air is pumped per stroke or per time unit. The gauge may also be a gauge measuring the actual amount of air passing through it.

[0052] The pump may be programmable so as to automatically carry out a predefined program. A user that frequently uses anal irrigation may experience a preferred way of carrying out the irrigation process. Then it would be advantageous to be able to programme this way into the pump system, so the irrigation process is done the most preferred way every time. Furthermore, caregivers may have a certain experience concerning the optimum process, which they can programme into the pump system. Thereby errors will be reduced.

[0053] The switching between the airflow to the balloon and the reservoir may be done automatically as result of a programme entered into the pump. This would provide an even more easy and safe way of carrying out the irrigation process, as the user (or caregiver) only needs to start the pump system and the steps of inflating the balloon and providing liquid into the rectum is done automatically.

- [0055] Pumping of approx. 150 ml air into balloon
- [0056] Switching the pump so as to provide air flow into the reservoir
- [0057] Pumping of air corresponding to displacing approx. 200 ml liquid from the reservoir
- [0058] 3-6 minute break
- [0059] Pumping of air corresponding to displacing approx. 300 ml liquid from the reservoir
- [0060] 3-6 minute break [0061] Pumping of air corresponding to displacing the remaining approx. 300 ml liquid from the reservoir
- [0062] 3-6 minute break

[0063] Usually it is advantageous to perform the irrigation process in several steps thereby preventing accumulation of liquid in the intestines. It varies from person to person what amount of liquid is needed-typically below 1 litre-and how long the break between the introducing of liquid should be. In a typical situation it would be advantageous to introduce the liquid divided over 3 steps with a break of 3-6 minute between the introductions.

[0064] Yet another aspect of the invention relates to a method of performing anal irrigation by using a system comprising a closed reservoir, a probe including an inflatable balloon connected to an air tube which air tube is connected to an air pump and a water tube extending between the probe and the reservoir, which method comprises the steps of

[0065] Connecting a peristaltic pump to the water tube

- [0066] Pumping air into the balloon using the air pump until the balloon is sufficiently inflated
- [0067] Using the peristaltic pump to pumping liquid from the reservoir, through the probe into the rectum until a sufficient amount of liquid has entered into the rectum
- [0068] Deflating the balloon
- [0069] Removing the probe from the rectum
- [0070] Removing the pump from the tube
- [0071] Awaiting emptying of faecal matter
- [0072] Disposing of the reservoir, tubes and probe and keeping the pump

[0073] Again this method is easy to use and ready to use very quickly. The balloon may be deflated as described earlier.

[0074] The peristaltic pump used in this method may also be electric and comprising a gauge for measuring the amount of water passing through the pump. Like with the click-on mechanism pump system mentioned above, the gauge may be in the form of a calibration on the pump indicating how much water is pumped per stroke or per time unit. The gauge may also be a gauge measuring the actual amount of water passing through it.

[0075] This pump may also be programmable so as to automatically control the amount of water entered in the rectum through the probe. The same advantages as mentioned earlier are obtained by using a programmable pump.

[0076] In an embodiment the pump is programmed to upon starting automatically perform the following sequence:

- [0077] Pumping approximately 200 ml liquid from the reservoir
- [0078] 3-6 minute break
- [0079] Pumping approx. 300 ml liquid from the reservoir
- [0080] 3-6 minute break

[0081] Pumping the remaining approx. 300 ml liquid from the reservoir

[0082] 3-6 minute break

[0083] Like before this is typical sequence, which would help in preventing accumulation of liquid in the intestines. This differs from the abovementioned sequence in that when using a peristaltic pump typically another air pump is used for inflating the balloon.

BRIEF DESCRIPTION OF THE DRAWING

[0084] FIG. 1 illustrates a system for anal irrigation

[0085] FIG. 2 illustrates an embodiment of a pump system having an integrated click-on mechanism

[0086] FIG. 3 illustrates an embodiment of a pump system having a separate but connected click-on mechanism

[0087] FIG. 4 illustrates a foil-pump making out a part of the pump system of FIG. 3

[0088] FIG. 5 illustrates an embodiment of a pump system having a separate but connected click-on mechanism-in this embodiment the pump is an electric pump

[0089] FIG. 6 illustrates a switch, which may be used in connection with the pump systems of the invention

DETAILED DESCRIPTION OF THE DRAWING

[0090] In FIG. 1 a system for performing anal irrigation is illustrated. The system comprises a pump 1 according to the invention positioned on a double lumen tube 2, 3 which constitute the liquid tube 2 and the air tube 3. The tubes are connected to the reservoir 4 and in the other end to a probe 5 having an inflatable balloon 6 attached to it. In this embodiment the pump comprises a switch 7 enabling it to be used for inflating the balloon as well as for pumping air into the reservoir to thereby displace the liquid from the reservoir. Example of a switch is shown in more detail in FIG. 6. When the system is to be used the pump 1 is attached to the air tube 3 (in case of a double lumen tube—to both tubes) and the switch 7 is positioned such that the air pumped into the tube enters the inflatable balloon 6. The user starts pumping and the balloon is inflated. When the balloon is sufficiently inflated, the switch is positioned in another position such that air pumped into the tube 3 enters the reservoir 4. As the pressure increases in the reservoir 4 the liquid contained in the reservoir is displaced through the tube 2 through the pump 1 and into and through the probe into the rectum. When a sufficient amount of liquid has been pumped into the rectum, the switch 7 is positioned so as to allow deflating of the balloon 6. Finally the probe 5 is removed and the pump is detached from the system. The reservoir, tubes and probe including balloon may be disposed of and the pump saved for reuse.

[0091] In FIG. 2 a pump system 100 according to the invention is shown. These figures illustrate a pump system having the click-on mechanism 101 integrated in the pump 102. FIGS. 2a-2c illustrates the pump system in a perspective view and FIGS. 2d-2f illustrates a cross-section through the pump. In FIGS. 2a and 2b the click-on mechanism of the pump system is shown in an open position ready for receiving a tube. In FIG. 2c the click-on mechanism of the pump system is shown in a closed position ready for performing the pumping action. The pump 102 is made as a bulb shaped element comprising two parts 102a, 102b, which are partly integral with each other. The two parts are also joined by a hingeelement 103, such that one part is pivotable with respect to the In the closed position the two parts are in contact with each other along contact surfaces 104, 105 in which depressions 106, 107, 108, 109 are made. These contact surfaces 104, 105 define the click-on mechanism of the pump enabling the pump to be individually positioned. The two larger depressions 106, 108 are adapted to receive a liquid tube 110 and the two smaller depressions 107, 109 are adapted to receive an air- or gas tube 111. In the embodiment shown the two tubes 110, 111 are shown as an integral element having two lumens but the two tubes may also be separate in which case the pump needs only one set of depressions for the air- or gas tube 111. At least one of the smaller depression 107, 109 comprises at least one cannula 112 with a cutting edge for incising into the air-tube 111. Both depressions may have cannulae for performing the incision. One of the contact surfaces 105 further comprises a snap projection 113 for cooperating with a snap indentation 114 in the other contact surface. This enables locking of the two parts together such that intimate contact between the cannula (e) 112 and the air-tube 111 is ensured. Surrounding the contact surfaces 104, 105 is resilient open celled foam 115 enclosed in a foil 116 as illustrated in FIGS. 2d-2f. The foam and the foil constitute together with the contact surfaces a foil-pump. The foil-element may be a plastic foil made of a thermoplastic elastomer like Styrol-Block-Copolymere such as SEBS (Styrene-Ethylene-Butylene-Styrene) or PUR (Polyurethane) or a thermoplastic material like PP (Polypropylene), PE (Polyethylene) and PVC (Polyvinyl Chloride). FIG. 2d illustrates a cross-section of the pump system 100 in the open position with the double lumen tube 110, 111 positioned in the depressions 106, 107. FIG. 2e illustrates the pump system 100 in a position just prior to completely closing, where the cannula 112 is ready to penetrate the air-tube 111. FIG. 2f illustrates the pump system 100 in a completely closed position. By compressing foam 115 at least a part of the gas contained in the foam 115 is displaced into the air tube 111 through the air channel 117 and through the cannula 112. In order to allow the foam to expand and be refilled with air the foam 115 may define a plurality of openings (not shown), which during compression are covered by the hand of the user compressing the foam, but which when the hand is removed allows the foam to be refilled. Moreover, the positionable pump system 100 may comprise a non-return valve preventing air to be sucked out of the gas tube 111 when the user removes his hand. An automatic or a manual switch as illustrated in FIG. 6 may be integrated in the pump system. [0092] In FIG. 3 another pump system 200 according to the invention is illustrated. In this embodiment the foil-pump 202 is separated from the click-on mechanism 201 such that the foil-pump 202 is placed next to the click-on mechanism 201 as opposed to surrounding it. An embodiment of the foilpump 202 is illustrated in FIG. 4. The click-on mechanism 201 corresponds largely to the click-on mechanism illustrated in FIG. 2 and is best illustrated in the side views in FIGS. 3c and 3d. The same reference numbers are used for same elements as in FIG. 2 except for the prefix 2 instead of 1, such that e.g. the hinge has reference number 203. In FIG. 3a an embodiment having a switchable pump system used for pumping air into the balloon as well as into the reservoir. In this embodiment the click-on mechanism has two cannulae (not shown)—one for cutting through the part of the air tube leading to the reservoir 211a and one for cutting through the part of the tube leading to the balloon 211 b, so as to fluidly connect the pump 200 to these parts of the tubes. Moreover, as

other thereby defining an open position and a closed position.

the air tube 211 is defined as one integrated tube, the pump 200 comprises means (not shown) for preventing fluid connection between the two parts of the tube 211a, 211b. Such means are positioned between the two cannulae. The cannulae correspond to the one described in relation to FIG. 2. The switchable pump system 200 comprises a switch 220 (FIGS. 3a and 3d) allowing the user to change between inflation of the reservoir and the balloon. The switch 220 is changeable between a first position wherein the switchable pump system 200 is in fluid connection with the reservoir and a second position wherein the switchable pump system 200 is in fluid connection with the inflatable balloon. When switch 220 is positioned in the first position the switch 220 is adapted to prevent deflation of the inflatable balloon and when positioned in the second position the switch 220 is adapted to prevent deflation of the reservoir. FIG. 3b illustrates an embodiment very like the one in FIG. 3a except that the pump system of FIG. 3b comprises two pumps 202a and 202b—one 202a for pumping air into the reservoir and one 202b for pumping air into the balloon. The click-on mechanism is equal to the one used in the embodiment of FIG. 3a (and illustrated in detail in FIGS. 3c and 3d) except this click-on mechanism comprises means for squeezing or pinching off the air tube between the two pumps. The switch is schematically illustrated at 220. The switch may be made as illustrated in FIG. 6.

[0093] FIG. 4 illustrates an embodiment of the aforementioned foil pump 202, having a gas inlet 240 comprising a non-return valve (not shown) which may be manufactured in the same way as the non-return valves disclosed in WO2005/ 048890 i.e. only allowing air into the foil pump 201 and preventing air from escaping the foil pump 201 through the gas inlet 240. Moreover, the foil pump 201 defines a gas outlet 241. The foil pump 201 comprises an open-celled foam 215 visible in FIG. 4b, which is surrounded by a foil 216. The foil pump 202 comprises a pump leaf 242 which when torn off enables the user to deflate the reservoir after irrigation and in order to discretely dispose the system in a bin or a reservoir. [0094] FIG. 5 illustrates a pump system 300 according to the invention, which is very like the pump system illustrates in FIG. 3. The only difference between the two pump systems is that the pump 302 in FIG. 5 is an electric pump. The same reference numbers are used for same elements except for the prefix 3 such that e.g. the recesses are numbered 306-309. The embodiment will not be discussed further.

[0095] FIG. 6 illustrates a manual switch 220 which may be used in the pump systems of this invention. The switch 220 comprises a lever mechanism 221 consisting of a lever 222 comprising an element 223 in each end. The lever 222 is attached to a bearer 224. Included in the bearer is an airchannel as indicated at 226. The elements 223 are adapted to in turn squeeze off the tube 211—hence they are made as elements having a rounded surface towards the tube 211. The air-channel 226 terminates in a cannula (not shown—e.g. like the one used in the click-on mechanism) and provides the air into the tube and the position of the squeezing elements 223 determines which way the air travels. The switch may comprise a handle 225 to move the switch from one position to the other.

1. A pump system for use in connection with a system for performing anal irrigation, which pump system comprises a pump adapted to provide for the liquid flow into the rectum

and which pump system comprises means for attaching the pump system on a tube in the anal irrigation system such that it is individually positionable.

2. A pump system according to claim **1** wherein the pump is electric.

3. A pump system according to claim **2** wherein the electric pump is programmable.

4. A pump system according to claim **2** wherein the electric pump further comprises a safety contact/safety device which has to be activated to enable the pump to be started.

5. A pump system according to claim **1** wherein the electric pump further comprises a display showing the status of a pumping action,

6. A pump system according to claim **2** wherein the electric pump further comprises data entry for external programming.

7. A pump system according to claim 2 wherein the electric pump further comprises a plug for charging of batteries.

8. A pump system according to claim **3** wherein the electric pump further comprises a keyboard for programming.

9. A pump system according to claim **2** wherein the electric pump further comprises a signalling device.

10. A pump system according to claim 2 wherein the pump system comprises attaching means including a click-on mechanism.

11. A pump system according to claim **10** wherein the click-on mechanism comprises at least one cannula adapted to cut into a tube of the anal irrigation system.

12. A pump system according to claim **10** wherein the click-on mechanism comprises a hinge.

13. A pump system according to claim 10 further comprising recesses within the click-on mechanism for receiving the tube.

14. A pump system according to claim 10 further comprising means for locking the click-on mechanism in a closed position.

15. A pump system according to claims **14** wherein the means for locking the click-on mechanism comprises a snap mechanism.

16. A pump system according to claim **10** wherein the pump system comprises a switch.

17. A pump system according to claim 16 wherein the switch is automatic.

18. A pump system according to claim **16** wherein the switch is integrated in the click-on mechanism.

19. A pump system according to claim **10** wherein the click-on mechanism is integrated in the pump.

20. A pump system according to claim **10** wherein the click-on mechanism is separated but connected to the pump.

21. A pump system according to claim 20 wherein the system comprises two separate pumps.

22. A pump system according to claim **1** wherein the pump is a peristaltic pump comprising a sliding drawer with means for receiving the tube.

23. A pump according to claim 1 further comprising a finger-grip.

24. A method of providing a system for anal irrigation using an anal irrigation system comprising a closed reservoir, a probe including an inflatable balloon, an air tube and a water tube extending between the probe and the reservoir, which method comprises attaching a click-on mechanism included in a pump system to the air tube at a desired position such that at least one cannula provided in the click-on mechanism penetrates the air tube.

25. A method according to claim **24** wherein the click-on mechanism comprises one or more recesses for one or more of the tubes to be enclosed in the click-on mechanism.

26. A method of providing a system for anal irrigation using an anal irrigation system comprising a closed reservoir, a probe including an inflatable balloon, an air tube attached to an air pump and a water tube extending between the probe and the reservoir, which method comprises attaching a pump system including a peristaltic pump to the water tube at a desired position by initially placing the water tube in a sliding drawer on the pump and subsequently closing the sliding drawer to provide contact between the impellers in the peristaltic pump and the water tube.

27. A method according to claim **26** wherein the system comprising one or more of the tubes, the reservoir and the probe is disposable.

28. A method according to claim **26** wherein the air pump is disposable.

29. A method of performing anal irrigation by using an anal irrigation system comprising a closed reservoir, a probe including an inflatable balloon, an air tube and a water tube extending between the probe and the reservoir, where the system further comprises a pump system comprising attaching means including a click-on mechanism having at least one cannula, the method comprising:

connecting the pump system to the air tube such that the at least one cannula comprised

in the click-on mechanism penetrates the air tube;

inserting the probe in the rectum;

pumping air into the balloon until the balloon is sufficiently inflated;

pumping air into the reservoir so as to displace liquid contained in the reservoir through the water tube and through the probe into the rectum until a sufficient amount of liquid has entered into the rectum;

deflating the balloon;

removing the probe from the rectum;

removing the pump from the tube;

awaiting emptying of faecal matter, and

disposing of the reservoir, tubes and probe and keeping the pump.

30. A method according to claim **29** wherein the pump system comprises a switch for switching pumping of air into the balloon and into the reservoir.

31. A method according to claim **29** wherein the pump is electric and comprises a gauge for measuring the amount of air passing through the pump.

32. A method according to claim **31**, wherein the pump is programmable so as to automatically carry out a predefined program.

33. A method according to claim **30** wherein the switching between the airflow to the balloon and the reservoir is done automatically as result of a programme entered into the pump.

34. A method according to claim **33** wherein the pump is programmed to upon starting automatically perform the following sequence:

pumping approximately 150 ml air into balloon;

switching the pump so as to provide air flow into the reservoir;

pumping of air corresponding to displacing approximately 200 ml liquid from the reservoir;

pausing for 3-6 minutes;

pumping of air corresponding to displacing approximately 300 ml liquid from the reservoir;

pausing for 3-6 minutes;

pumping of air corresponding to displacing the remaining approximately 300 ml liquid from the reservoir; and pausing for 3-6 minutes.

35. A method of performing anal irrigation by using a system comprising a closed reservoir, a probe including an inflatable balloon connected to an air tube which air tube is connected to an air pump and a water tube extending between the probe and the reservoir, the method comprising:

connecting a peristaltic pump to the water tube;

pumping air into the balloon using the air pump until the balloon is sufficiently inflated;

pumping liquid from the reservoir with the peristaltic pump, through the probe into the rectum until a sufficient amount of liquid has entered into the rectum;

deflating the balloon;

removing the probe from the rectum;

removing the pump from the tube;

awaiting emptying of faecal matter;

disposing of the reservoir, tubes and probe and keeping the pump.

36. A method according to claim **35** wherein the pump is electric and comprises a gauge for measuring the amount of water passing through the pump

37. A method according to claim **36**, where the pump is programmable so as to automatically control the amount of water entered in the rectum through the probe.

38. A method according to claim **37** wherein the pump is programmed to upon starting automatically perform the following sequence:

pumping approximately 200 ml liquid from the reservoir; pausing for 3-6 minutes;

pumping approximately 300 ml liquid from the reservoir; pausing for 3-6 minutes;

pumping the remaining approximately 300 ml liquid from the reservoir; and

pausing for 3-6 minutes.

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