June 17, 1941. H. E. DIERKER 2,245,653

THERAPEUTIC APPARATUS

Filed April 1, 1940

Fig. 1

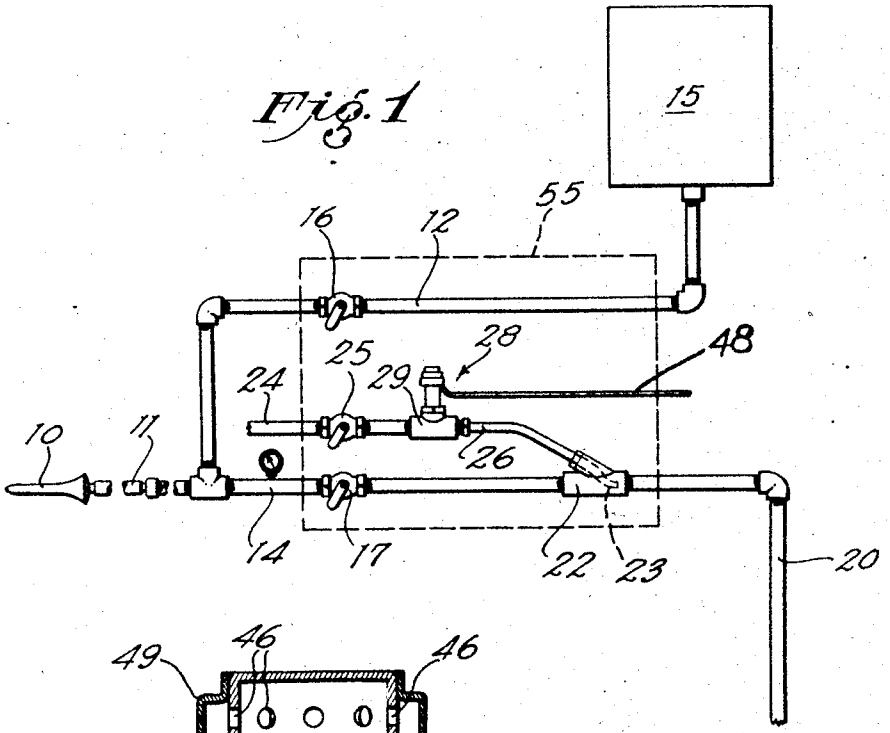
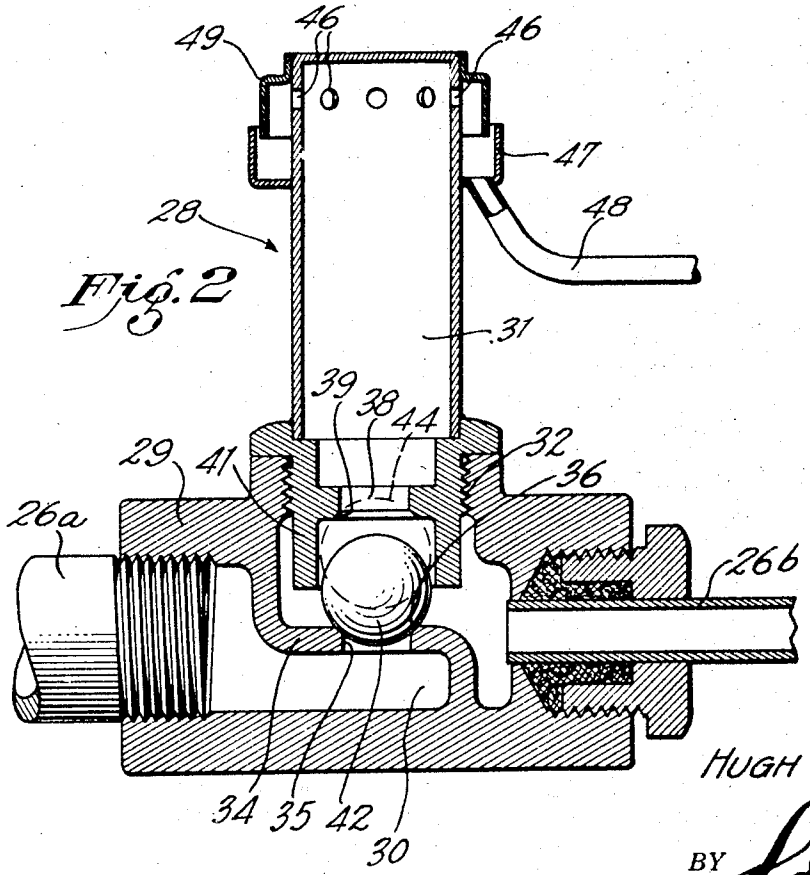


Fig. 2



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THERAPEUTIC APPARATUS

Hugh E. Dierker, Los Angeles, Calif.

Application April 1, 1940, Serial No. 327,268

4 Claims. (Cl. 128—227)

My invention relates to improvements in colonic therapy apparatus which operates to expand and contract the colon for the purpose of stimulating the musculature of same in order to rehabilitate peristalsis and of working free retentions of feces.

In my two issued patents, No. 1,910,756, for Colon irrigator, dated May 23, 1933, and No. 2,024,967, for Method and apparatus for rehabilitating peristalsis of the colon, dated December 17, 1935, I disclosed an apparatus of the general character stated above, and reference to these two patents may be had for a full and complete disclosure of such apparatus and their method of operation.

In the use of such apparatus vacuum is employed for contracting the colon and the technician carefully watches the reactions of the patient and at the proper time discontinues the vacuum. In the practice of this technique it has been demonstrated that in certain cases much better results are obtained when the vacuum is relieved at the instant the technician observes the reactions which indicate that the vacuum should be relieved. In the usual apparatus the outlet pipe is connected to a sewer connection pipe which extends downwardly, and therefore when the vacuum is discontinued there is a head of water in this downwardly extending pipe which by siphon effect exerts a suction on the colon which may, although it be small, prevent the colon from functioning in a natural manner.

It is an object of my present invention to provide a colonic therapy apparatus of the general character referred to in my two issued patents in which the vacuum in the outlet conduit is immediately broken when the operator places the vacuum producing means in an inoperative position. By this means the suction on the colon tending to contract the same is immediately cessated.

It is another object of my invention to provide a colonic therapy apparatus in which the vacuum breaking means is placed in the suction producing means so that it may serve the dual purpose, first, of breaking the vacuum in the outlet conduit and, second, preventing back siphonage into the water supply.

Other objects of my invention are embodied in the details of construction and will be brought out during the course of the description of the preferred embodiment of my invention.

Referring to the drawing:

Fig. 1 is a diagrammatic view illustrating my invention.

Fig. 2 is a vertical sectional view through the vacuum release means or vent means of my invention.

Referring to Fig. 1, my invention provides an applicator 10 adapted to be inserted in a body cavity, such as the colon. Connected to the applicator 10 through a short interconnecting conduit 11 is an inlet conduit 12 and an outlet conduit 14. Solution may be supplied to the inlet conduit 12 by any suitable means, such as a solution container 15. In the inlet conduit 12 is an inlet valve 16 and in the outlet conduit 14 is an outlet valve 17. These valves may be operated to allow fluid to be injected into the colon or to be removed therefrom, depending upon which of the valves is opened or closed. The outlet conduit 14 is connected to a sewer connection pipe 20 which extends downwardly as shown and is connected to the sewer.

For the purpose of creating a suction or vacuum in the outlet conduit 14 whereby the colon may be contracted, my invention provides an injector 22 having an injector nozzle 23. For the purpose of supplying water under pressure to the injector 22, my invention provides a water supply means including a water pipe 24 and a water control valve 25. Connected between the valve 25 and the injector 22 is a connecting pipe 26. When the valve 25 is opened water under pressure flows through the injector nozzle 23 and thus produces a suction or vacuum in that portion of the outlet conduit to the left of the injector 22.

Positioned in the connecting pipe 26 is a vacuum release means or vent means 28 which constitutes an important element of my invention. This vacuum release means includes a body 29 having a passage 30 connected to the portions 26a and 26b of the connecting pipe 26. Connected to the body 29 is a vent chamber 31 which is removable, being threadedly secured in place as indicated at 32. The passage 30 is provided with a wall 34 having an opening 35 surrounded by a lower seat 36. The vent chamber 31 is provided with a lower opening 38 which is surrounded by an upper valve seat 39. Depending from the valve seat 39 is a retaining skirt 41 which provides a chamber in which a valve in the form of a stainless steel ball 42 is placed. This valve is movable from full position, as shown in Fig. 2, into dotted line position 44. When in full line position the ball 42

engages the seat 36, and when in dotted line position the ball 42 engages the seat 38.

The upper end of the vent chamber 31 is provided with vent openings 46 and below these vent openings 46 is a trough 47 to which a drain 48 is connected. Secured to the upper end of the vent chamber 31 is a guard 49 which prevents water from flowing in an outward horizontal direction over the trough 47.

The apparatus disclosed herein operates in accordance with the teachings of my two prior patents but has the additional features and advantages which will now be pointed out.

After the colon has been filled or partly filled with liquid and it is desired to contract the same, the inlet valve 16 is closed, the outlet valve 17 is opened, and the control valve 25 is also opened. With the control valve 25 open, water under pressure flows through the connecting pipe 26, the nozzle 23, and into the outlet conduit 14. This produces a vacuum on the outlet conduit 14. When water starts to flow through the connecting pipe 26 it flows into the body 29 of the vacuum release means 28 and must dislodge the valve 42 from the seat 36. This it does because the water is under pressure, and in view of the fact that the part 26b is of smaller area of cross-section than the part 26a of the connecting pipe 26 a pressure will be developed in the body 29 which moves the ball 42 upward into dotted line position 44, thus engaging the upper seat 38 and closing the opening 38. There is usually some flow of water past the ball 42 which occurs during the movement of the ball to its upper position, and this water flows into the vent chamber 31. The vent chamber 31 is made sufficiently large so that in normal operation the water leaking past the ball 42 will never fill the vent chamber and flow outwardly through the openings 46. However, should the valve 42 fail to properly seat and leakage occur thereby, the water will first fill the vent chamber 31 and then overflow into the trough 47 and outward through the drain 48. The drain 48, as shown in Fig. 1, extends to the exterior of the enclosure represented by dotted lines 55 and the operator will note the leakage and may shut down the apparatus. It will be understood, however, that ordinarily the ball 42 will properly seat and there will be no leakage.

When the operator desires to discontinue the contracting action the valve 25 is closed and at this time the suction producing means becomes inoperative. When the pressure is relieved in the body 29 of the vacuum release means the ball 42 will drop by gravity into full line position. This, it will be seen, vents the part 26b of the connecting pipe 26 to the atmosphere, and since this part 26b is connected to the nozzle 23 which is in turn connected to the outlet conduit 14, the outlet conduit is vented to the atmosphere and the liquid in the connecting pipe 26 is free to flow therefrom without exerting a vacuum on the outlet conduit or the colon. When this ball 42 engages the seat 36 it positively seals the water supply pipe 24 from the injector 22 and prevents back siphonage. It will be understood that whenever the pressure in the body 29 is reduced sufficiently the ball 42 will drop into full line position shown in Fig. 2.

As a result of my new combination as disclosed herein, it is possible for the technician in special or sensitive cases to stop the contracting action on the colon instantly. This enables the technician to administer treatments more accurately and thus in special cases obtain better results. By placing the vacuum release means in the suction producing means it is also possible to obtain the additional feature of preventing back siphonage into the water supply.

In the foregoing description I have illustrated but one embodiment of my invention. It should be understood, however, that the features and advantages may be incorporated in other structures, and I therefore do not wish to be limited to the precise form of my invention disclosed herein but wish my invention to be construed in accordance with the spirit and scope of the appended claims.

I claim as my invention:

1. In a therapy apparatus, the combination of: an applicator; an inlet conduit connected to said applicator; liquid supply means connected to said inlet; an outlet conduit connected to said applicator; inlet and outlet valve means for said conduits; vacuum producing means connected to said outlet conduit and operable to produce a vacuum therein; and vent means operable to automatically vent said vacuum producing means to the exterior only when said vacuum producing means is in non-operating condition.

2. In a therapy apparatus, the combination of: an applicator; an inlet conduit connected to said applicator; liquid supply means connected to said inlet; an outlet conduit connected to said applicator; inlet and outlet valve means for said conduits; an injector in said outlet conduit operable to produce a vacuum therein; a water supply means having a control valve; a connecting pipe connected to said water supply means and said injector; and vent means connected to said connecting pipe including a vent opening and a valve, said valve being adapted to close said vent opening when said water supply control valve is open and to open same only when said water supply control valve is closed and there is a vacuum in said outlet conduit.

3. In a therapy apparatus, the combination of: an applicator; an inlet conduit connected to said applicator; liquid supply means connected to said inlet; an outlet conduit connected to said applicator; inlet and outlet valve means for said conduits; an injector in said outlet conduit; a water supply means having a control valve; a connecting pipe connected to said water supply means and said injector; and vent means in said connecting pipe including a vent chamber connected to said connecting pipe, a lower valve seat in the said connecting pipe, an upper valve seat in said vent chamber, and a valve adapted to engage automatically either of said seats.

4. In a therapy apparatus, the combination of: an applicator; an inlet conduit connected to said applicator; liquid supply means connected to said inlet conduit; an outlet conduit connected to said applicator; valve means for said inlet and outlet conduits; a vacuum producing injector in the outlet conduit on the downstream side of its valve means; a water supply line leading to the injector to operate the latter; valve means in the water supply line to control the flow therethrough; vent means including an opening and connected in the water supply line between its valve means and the injector; differential pressure operated valve means associated with the vent means and automatically operable to close the vent opening when the valve means in the water supply line is open and to open the vent opening only when said valve means is closed; and a liquid drain for the vent means.

HUGH E. DIERKER.