

[54] **BARIUM ENEMA ADMINISTRATION
METHOD AND APPARATUS**

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128/349 BV, 348**

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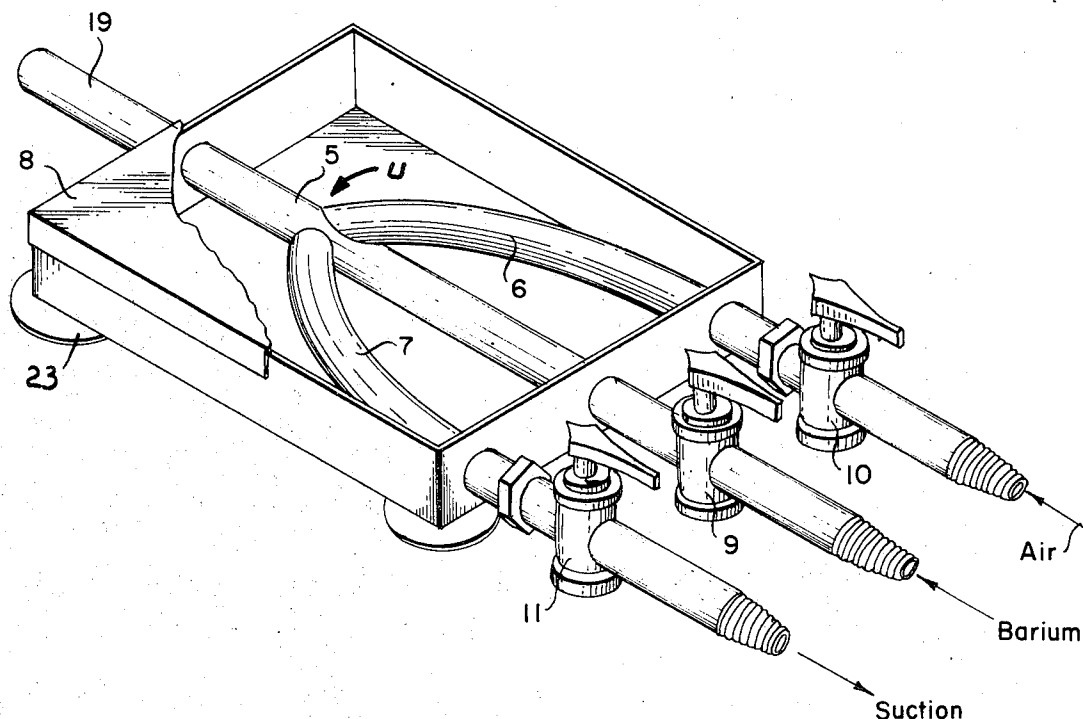
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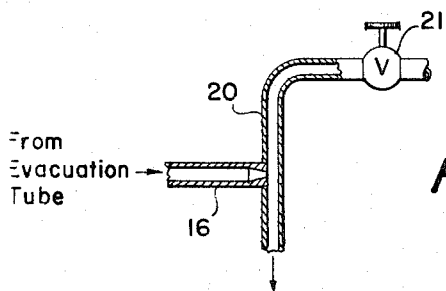
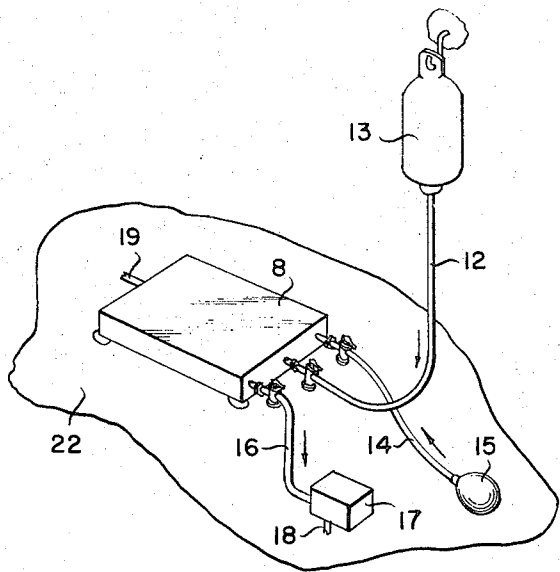
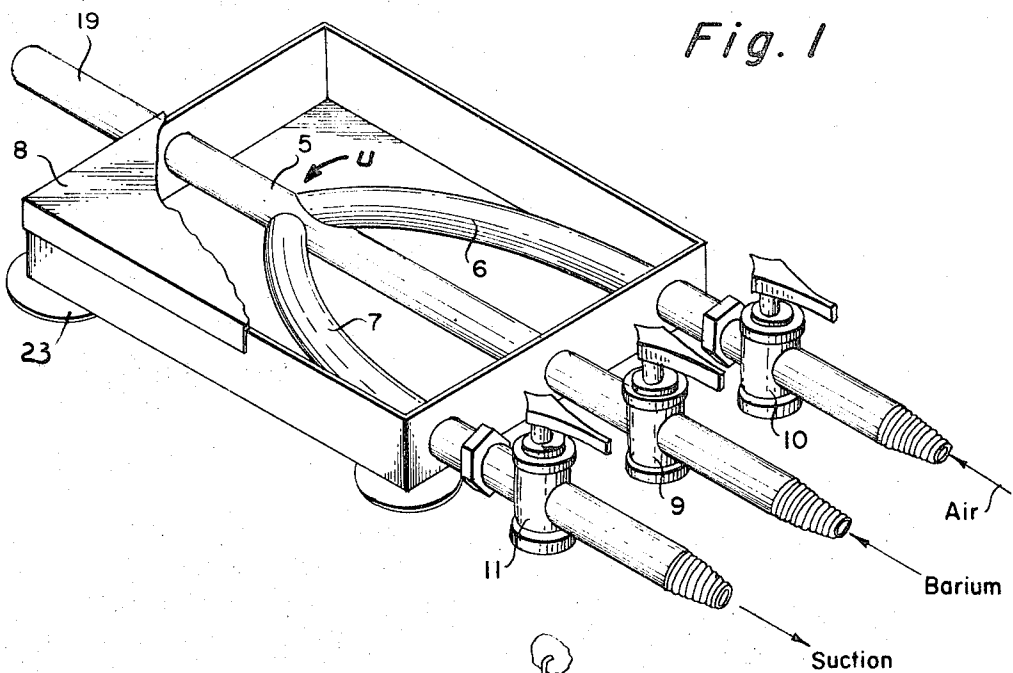
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ABSTRACT

Barium enema fluid is supplied to a patient through a three-way union of conduits, one of which is connected to a gravity fed barium supply source, another of which is connected with a source of air under pressure, and the other of which is an evacuation line connected to a source of suction. Each conduit is controlled by an individual valve. The valves are opened and closed in a prescribed sequence as directed by a radiologist who takes X-rays at various stages during and after administration of the enema.

6 Claims, 3 Drawing Figures





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BARIUM ENEMA ADMINISTRATION METHOD AND APPARATUS

BACKGROUND

The field of the present invention is the medical technique of colonic irrigation in general, and in particular to enema administration of barium for X-ray photography.

The prior art directly concerned with enema administration generally follows either the force method in which the enema fluid is injected into and through the rectum under pressure, or the peristaltic method in which the enema fluid is flowed in to the rectum by gravity and then caused to progress into the intestinal tract by peristaltic action of the bowels. A third method, which actually is a variant of the force method, is the centuries old enema can or bag in which the enema fluid is gravity fed from a can or bag elevated above the patient's body. Rectal injection of enema fluid at pressures above gravity is not suitable for the administration of barium as there is danger of over expansion of the intestine wall. Rectal injection of barium by the peristaltic method is not suitable for the introduction of barium because it requires repetitive recycling over an extended period of time and is highly wasteful of the barium. The conventional enema bag is slow in operation and wasteful of barium.

SUMMARY OF THE INVENTION

The present invention is in the gravity feed enema bag category, but embodies a novel method and apparatus that facilitates the taking of X-ray pictures by the introduction with ease of barium into the human system together with efficient and comfortable removal of the barium during and after the taking of the necessary X-rays. It changes the slow and uncomfortable procedure of the prior art into a faster and more comfortable one for the patient, and produces a faster and more accurate method for a radiologist to take the necessary X-rays for diagnostic purposes.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, partly removed, of the three-way conduit system of the apparatus.

FIG. 2 is a perspective view illustrating the service connection of the unit shown in FIG. 1 with other elements of the apparatus.

FIG. 3 is a diagrammatic view illustrating an alternative means for producing suction in the system.

DETAILED DESCRIPTION

The preferred embodiment of the invention herein disclosed comprises a three-way conduit union U in combination with a barium supply source, of air under pressure, an evacuation line, and rectal insertion tube. The three-way union consists of a central barium flow conduit 5 flanked by an air supply conduit 6 and an evacuation line conduit 7 all lying in a horizontal plane common thereto and supported by extension through opposed walls of a metal housing 8 which encloses the three-way union.

Externally of the housing the barium flow conduit 5 is controlled by a valve 9 arbitrarily colored red, the air supply conduit 6 is controlled by a valve 10 arbitrarily colored green, and the evacuation conduit 7 is controlled by a valve 11 arbitrarily colored blue. The barium flow valve 9 is in communication through a flexible

conduit 12 with an enema bag 13 containing barium. The air supply valve 10 is in communication through a flexible conduit 14 with a conventional hand bulb air pump 15, and the evacuation conduit valve 11 is in communication through a flexible conduit 16 with a conventional suction pump 17 which has a drain conduit 18. An extension 19 of the barium conduit 5 is arranged for connection to a rectal insertion tube (not shown) of conventional, disposable tip form.

An alternative form of suction producing means for the evacuation conduit 7 is shown in FIG. 3. In this form the flexible conduit 16 leading from the valve 11 is in communication with the spigot line 20 of a water faucet (not shown). The spigot line is controlled by a T-valve 21. When the T-valve is opened water flows through the spigot line 20 with a venturi effect which imparts suction to the evacuation conduit 16.

METHOD OF OPERATION

The housing 8 is provided with suction cups 23 on its bottom so that it may sit on the top 22 of a table. In addition it provides a small, compact carrier for the three-way union, making it easily portable. When the apparatus is to be placed in service, all valves are first closed and the bag 13 filled with barium is suspended from an appropriate support at such height above the table as will insure that the barium will flow by gravity through its flow conduit when the red valve 9 is opened. The various conduits between the control valves and the air pump 15 and suction pump 17 are connected, the rectal tube (not shown) is connected to the extension 19 of the barium conduit 5 and inserted in the patient's rectum. Next, the red barium control valve 9 is opened to permit gravity flow of the barium through the system into the intestinal tract of the patient. When the radiologist decides that there is sufficient barium in the patient for his X-ray taking, the barium supply valve 9 is closed.

The next step is to remove excess barium from the patient. This is accomplished by opening the blue evacuation control valve 11, whereupon the pump 17 or the venturi attachment of FIG. 3, whichever is used, applies suction to the system and withdraws the excess barium for discharge through the drain 18 or spigot 20 as the case may be. When the radiologist decides that enough barium has been withdrawn the evacuation control valve 11 is closed. With the supply of barium cut off and the evacuation stopped, the green valve 10 is opened to supply air from the hand pump 15 to enter and inflate the patient's colon to facilitate full barium coating of the colon wall and its recesses. When the radiologist decides that sufficient air has been admitted to insure full coating the air control valve 10 is closed. Following completion of the X-ray photography, residual barium may be removed from the patient by opening the suction control valve 11 and evacuating the barium by suction through the evacuation conduit 16.

The rectal insertion tube (not shown) then is removed from the patient and its disposable tip is discarded. The patient's colon is now fully conditioned for the taking of X-rays, which are continued until the desired number have been taken.

The apparatus is cleaned by a disinfectant solution supplied from an enema bag. With all valves closed, the red valve 9 is opened to permit disinfectant to flow from the bag through the apparatus and rectal tube (the end of which is already in a disposal sink). After

3

the disinfectant has gone completely through the apparatus the end of the rectal insertion tube is submerged in a container of clear water, after which the red valve 9 is closed. The blue evacuation valve 11 then is opened and the resulting a suction in the conduit 7 and tube 16 draws clear water through the submerged rectal tube and through the apparatus, thoroughly flushing the system and rinsing out the disinfectant.

I claim:

1. Apparatus for administering a barium enema comprising, in combination: a barium supply source ; with an associated delivery conduit; a pressurized air supply source ; with an associated delivery conduit; a source of suction with an associated delivery conduit; and an enema delivery conduit; a multi-way conduit union means; a portable housing enclosing the multi-way union means; the union having a terminal portion individual to each conduit with each said terminal portion extending through and supported by an adjacent wall of the housing; individual conduits connecting said terminal portions of the union with the barium, air, and suction sources, respectively, and with the enema deliv-

4

ery conduit; and a control valve in each of said union terminal portions connected with the barium, air, and suction delivery conduits; the valves being disposed externally of the housing.

2. In the apparatus of claim 1, said source of suction being a vacuum pump.

3. In the apparatus of claim 1, said source of suction being a water-faucet venturi fitting.

4. In the apparatus of claim 1, said air supply source being a hand bulb pump.

5. In the apparatus of claim 1, said barium supply source being a gravity feed enema bag.

6. A method of administering a barium enema, which comprises the sequential steps of: injecting into an intestinal organ of a patient, by gravity feed, a quantity of barium for coating the interior of the organ; removing by suction barium in excess of the quantity required; injecting into the organ pressurized air to inflate the organ somewhat; discontinuing the injection of air; and thereafter removing residual barium from the organ.

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